APOLLO 9

Technical Air-to-Ground
Voice Transcription

(MOSS NET 1)

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS
March 1969
Introduction

This is the transcription of the Technical Air-to-Ground Voice Transmission (GOSS NET 1) from the Apollo 9 mission.

Communicators in the text may be identified according to the following list of definitions.

Command Module:

CDR Commander
CMC Command module pilot
LMP Lunar module pilot
SC Unidentifiable crewmember

Mission Control Center:
CC Capsule Communicator (CAP COMM)
F Flight

Remote Sites:
CT Communications Technician (COMM TECH)

Recovery Forces:
GUAD USS Guadalcanal
R Recovery helicopter

A series of three dots (...) is used to designate those portions of the communications 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 a point at which a recording was terminated abruptly.
**APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION**

(COSS NET 1)  

**MILA (REV 1)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 00 03</td>
<td>CC</td>
<td>Roger. Clock's going.</td>
</tr>
<tr>
<td>00 00 03 13</td>
<td>CC</td>
<td>Roger. There's our roll program, and now we're reading you loud and clear.</td>
</tr>
<tr>
<td>00 00 03 44</td>
<td>CC</td>
<td>Roger. One Bravo.</td>
</tr>
<tr>
<td>00 00 03 58</td>
<td>CC</td>
<td>Apollo 9, you are GO for staging. And you are mode 1 Charlie.</td>
</tr>
<tr>
<td>00 00 02 04</td>
<td>CDR</td>
<td>EDS OFF.</td>
</tr>
<tr>
<td>00 00 02 48</td>
<td>SC</td>
<td>...</td>
</tr>
<tr>
<td>00 00 03 27</td>
<td>CC</td>
<td>And, Apollo 9, Houston, your thrust looks good.</td>
</tr>
<tr>
<td>00 00 03 02</td>
<td>CC</td>
<td>Apollo 9, you are GO for tower JETT.</td>
</tr>
<tr>
<td>00 00 03 04</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>00 00 03 16</td>
<td>CDR</td>
<td>There's SEP.</td>
</tr>
<tr>
<td>00 00 03 18</td>
<td>CMP</td>
<td>Tower JETT --</td>
</tr>
<tr>
<td>00 00 03 19</td>
<td>SC</td>
<td>-- Looks good.</td>
</tr>
<tr>
<td>00 00 03 32</td>
<td>CMP</td>
<td>We're looking good here, I've got the tower OFF.</td>
</tr>
<tr>
<td>00 00 03 32</td>
<td>CC</td>
<td>And, Apollo 9, we're still in guidance INITIATE - everything looks good.</td>
</tr>
<tr>
<td>00 00 03 40</td>
<td>CC</td>
<td>Apollo 9, you are GO all the way. Everything looks good.</td>
</tr>
<tr>
<td>00 00 03 43</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>00 00 03 56</td>
<td>CDR</td>
<td>Houston, did you read our comment that our SPS helium pressure went to zero, indicated zero at lift-off?</td>
</tr>
<tr>
<td>00 00 04 07</td>
<td>CC</td>
<td>Apollo 9, this is Houston. I did not copy.</td>
</tr>
<tr>
<td>00 00 04 09</td>
<td>CDR</td>
<td>Roger. Be advised our SPS helium pressure went to zero at lift-off.</td>
</tr>
<tr>
<td>00 00 04 15</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>00 00 04 17</td>
<td>CDR</td>
<td>Okay. You got any good words on that, why don't you give them to me when you can?</td>
</tr>
</tbody>
</table>
00 00 04 22 CC Roger. It is GO here, Apollo 9.
00 00 04 24 CDR Very good.
00 00 05 01 CC And, Apollo 9, it's 5 minutes, and everybody is as happy as a clam here. Looking good.
00 00 05 05 CDR So are we.
00 00 05 11 CC Apollo 9, you have S-IVB to orbit capability.
00 00 06 15 SC Roger here. Roger here.
00 00 06 17 CC Your level sense arm time is 08 plus 21; predicted S-IV cutoff 08 plus 56.
00 00 06 22 CDR 08:21 and 08:56. Roger. And we've got S-band on Delta.
00 00 06 27 CC Copy. Um, Delta. Thank you.
00 00 06 55 LMP And the rookie says that looks beautiful.

00 00 07 01 CC And rookie, at 7 minutes, everything is going real great.
00 00 07 05 LMP Roger.
00 00 08 04 CC Apollo 9, at 6 minutes everything is GO.
00 00 08 08 CDR Roger. Everything looks fine here, too.
00 00 08 10 CC Very good. The COMM is beautiful, Jim. You are really coming through clear. I read you nice and -
00 00 08 15 CDR Roger. Your - nice and clear and loud, too, Smokey. We had no trouble with COMM on launch at all.
00 00 08 25 CC Roger. Copy that, Apollo 9, and you are GO for staging.
00 00 08 29 CDR Roger. Getting a little vibration. About eight -
00 00 09 03 CDR Staging complete, and S-IVB is running.
Roger, 10 copy, staging complete. We're showing good thrust on S-IVB. Everything is GO.

Okay. We're guiding now.

Apollo 9, you have mode 4 capability and everything is GO. You are real solid.

Roger. What time do you think we can shut down?

We will have that for you in a flash, Apollo 9.

Okay.

My onboard FIDO here says we are doing okay.

Yes. Everything is looking good here, Apollo 9.

Okay.

We'll try to have your cut-off time shortly.

Better hurry. I'm going to cut off first.

Roger.

Shutdown -

Roger. Shutdown.

Okay.

Houston, we've got 103 by 89.5.

Roger, Apollo 9. Copy.

And, Apollo 9, you are GO in the orbit.

Roger.

And your CMC is GO; it is valid.

Okay.

And, Apollo 9, the S-IVB has been safed.

Roger. Safed. Do you have our apogee and peri-

Not yet, Apollo 9. Stand by.
00 00 12 06  CDR  Okay.

VANGUARD (REV 1)

00 00 13 05  CC  Apollo 9, the S-IVB has been configured for orbit. It's looking real good, and your EPS helium is solid as a rock.

00 00 13 14  CDR  Roger. We copy. Thanks a lot.

00 00 13 16  CC  Roger.

00 00 17 09  CC  Apollo 9, Houston.

00 00 17 12  CDR  Roger. Go ahead, Houston.

CANNERY (REV 1)

00 00 17 14  CC  Roger. We've got Canaries here. You can configure SIMPLEX Alfa.

00 00 17 31  CC  Apollo 9, Houston. Did you copy?

00 00 17 51  CC  Apollo 9, Houston. Do you read?

00 00 17 57  CDR  Roger, Houston. Five-by. How us?

00 00 18 00  CU  Okay. You're coming in five-square. We switched over, all right, I guess, and everything looks good.

00 00 18 06  LMP  Roger. What kind of orbit did you get us in?

00 00 18 09  CC  We don't have it yet, Apollo 9. We are still running it through the computers.

00 00 18 15  SC  Okay.

00 00 19 03  CC  Apollo 9, Houston.

00 00 19 07  CDR  Go, Houston. Apollo 9.

00 00 19 09  CC  Roger. With our 100 MHz radar we're showing you 107 by 96.9 as the first cut.

00 00 19 21  LMP  Roger. 107, 98.9.
And we are continuing to message this, Apollo 9, and we will keep you updated.

Roger. Understand.

Apollo 9, Houston. We've got 1 minute with you at Canaries, and we will see you over Tananarive at 37.

Roger. Tananarive at 37. Thank you.

Roger. Out.

Hello, Apollo 9. This is Houston. Do you read?

Hello, Apollo 9. Houston through Tananarive.

Apollo 9, this is Houston through Tananarive.

Go ahead, Houston.

Roger, Apollo 9. Our Canary data shows your orbit at 103.9 by 102.3.

Roger. Understand 103.9 by 102.3.

That is affirmative, and that changes slightly as the S-IVB vents, but that was a pretty good blast at 37 on Canaries.

And we'll have you here at Tananarive for about another 5 minutes.

Roger. Pressure looks good, hub?

Houston, Apollo 9. Do you copy our parking angles?

We have no data here at Tananarive, Dave. You will have to read them to us.

Very well. GMT was 39:09 plus 00:116 minus 00:032 minus 00:100.

Roger. Apollo 9, this is Houston. I copied the time and the angles. Thank you.

Works like a charm.
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(COSS NET 1)

00 00 39 38 CC Roger. Looks like the platform was right there. And that was a nice speedy job on that 52.

00 00 39 52 CMP Good old AUTO optics.

00 00 39 55 CC I see. Copy.

00 00 41 48 CC And, Apollo 9, this is Houston. We are going to lose you here at Tananarive in about 45 seconds, and we'll see you over Cenarvon at 52.

00 00 41 58 CMP Roger. 52 at Cenarvon.

CARNAHMON (REV 3)

00 00 53 25 LMP Hey, Houston. How do you read? Apollo 9.

00 00 53 28 CC Apollo 9, this is Houston. Reading you loud and clear through Cenarvon.

00 00 53 32 LMP Okay. I'm presently in a backup COOM check - step five there on LMP 1 dash 2, and I'm on line 5. I got the initial contact, and I got my S-band volume up.

00 00 53 46 CC Roger. Understand you are in step 5 and stand by one here.

00 00 54 00 LMP Roger. And I'm standing by for a GO for the backup voice check.

00 00 54 05 CC Roger. We will give you a GO on that in about 31 seconds here.

00 00 54 10 LMP Okay-dokey.

00 00 54 26 CC Okay. Apollo 9, this is Houston. We are standing by for your voice check on the S-band. Let her rip.

00 00 54 48 CC Okay. Apollo 9, this is Houston. I did not copy anything. I got one blast in there sounded like you keyed, and that was all.

00 00 55 48 CC Apollo 9, this is Houston on the VHF. Do you read?

00 00 56 03 CC Apollo 9, Apollo 9, this is Houston on - via the VHF. Do you read?
Roger, Houston. I gave you a call on DOWNVOICE BACKUP, and evidently you are not reading on it. However, I'm reading you up on the S-band.

Okay, and we confirmed with the site that we did not get an S-band downlink on that one, Rusty.

Roger. We will be standing by for suggestions. Let me just give you my configuration here, if you want to copy that.

Roger. I copy that, Apollo 9. Let us call that over. We are going to have you here about another minute at Carnarvon, and then we are going to pick up over Honeysuckle at about 50 - it'll be just about on the hour, so have your S-band volumes up at that time.

Roger. And be advised, we are rushing on through all our checklist here, and we've got most everything done. The fuel cell purge check checked out okay.

Roger. Sounds great and, Apollo 9, you are GO for 6 dash 4.

Roger, GO for 6 dash 4.

And, Houston, be advised that I'm going to go out of this backup COM check configuration here and go back to NORMAL.

Roger. Let's meet you over Honeysuckle in normal configuration just about on the hour.

Roger.

HONEYSUCKLE (REV 1)

Apollo 9, this is Houston through Honeysuckle.
Apollo 9, this is Houston through Honeysuckle.

You're 5-square on S-band, Apollo - or Houston.

Roger. You're - that's really great, Rusty. You're coming in, and if you want to try this backup COMM check again, we can support it. It's dealer's choice. And just as we were leaving Camerons, the downlink appeared to be coming through on the backup.

Okay. Why don't we forget it right now, and we'll try to check that at some quiet period.

Roger. We concur.

And, Apollo 9, this is Houston. We are going to lose you here at Honeysuckle in about 40 seconds, and we will see you over Huntsville in about 3 minutes.

Roger.

Huntsville (REV 1)

And, Apollo 9, this is Houston through the Huntsville.

Huntsville cannot maintain valid two-way range, so we lost signal bearing in advancing.

Hello, Apollo 9, this is Houston. You read through the Huntsville?

Huntsville is valid in two way ...

And, Apollo 9, this is Houston through the Huntsville.

Roger.

Houston, Apollo 9. You're coming through garbled.

Okay, Apollo 9, this is Houston. You're breaking up pretty badly. We don't have much to pass you here - we're only going to have you for about another minute and a half, and we'll talk to you as you come across the States and pass the data to you then.
00 01 10 35 CMP Roger.
00 01 11 16 CC And, Apollo 9, this is Houston if you can read me. We'll see you over the Redstone at about 24.
00 01 11 25 CMP Roger.
00 01 13 00 CT Huntsville LOS.

REDSTONE (REV 1)

00 01 23 57 CC Apollo 9, this is Houston through the Redstone. Standing by.
00 01 24 25 CC Apollo 9, this is Houston through the Redstone.
00 01 24 30 LMP Roger, Houston. Apollo 9. How do you read?
00 01 24 32 CC You're clear as a bell, Apollo 9; this is Houston.
00 01 24 38 LMP Roger.
00 01 24 42 CC And, Apollo 9, we'd like to confirm that you are in omni Baker and primary S-band transponder.
00 01 24 54 LMP Let me do that for you.
00 01 26 48 CC Apollo 9, Houston.
00 01 26 51 LMP Go ahead.
00 01 26 53 CC Roger. It may be a coincidence, but we lost data just about the time I gave you that transmission to clarify that omni Baker. Did you change configuration then?
00 01 27 05 LMP That's affirmative. We are - we were on Delta and I just switched it to omni for you.
00 01 27 15 CC I understand you did go from Delta to Baker and the primary transponder was ON. You didn't need to change that, did you?
00 01 27 23 LMP That's a negative. The primary was ON.
00 01 27 31 CDR How are you doing down there, Smokey?
00 01 27 33 CC We're pressing along, Jim. And we're - you can anticipate we'll probably have a state vector
we want to uplink over Bermuda or Vanguard - in 5 or 10 minutes, and for Rusty's benefit, the backup COM check over Carnarvon was 5-square. It came in - we had a momentary dropout there, but we got it real good.

00 01 27 56 LMF Goody. We'll write that one off then.

00 01 27 58 CDR Okay. We have got all of the checklist done except the glycol and some things that we're going to do right now. And we haven't taken the PIPA bias check either. I guess you guys want to do that.

00 01 28 10 CC Roger. We'll try it. We have no data right now, 9.

00 01 29 12 CC And, Apollo 9, this is Houston. For your info we do have our data coming in now solid. And Jim - for the bias check - We really will get a good one on you after TD and E.

END OF TAPE
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00 01 31 55 CMP And, Houston, Apollo 9.
00 01 31 57 CC Go, Apollo 9.
00 01 31 59 CMP Roger. We just got a MASTER ALARM cryo PRESS here on the number 1 H2 tank. It's just off the lower limit here; you might want to take a look at that.
00 01 32 11 CC Roger, Apollo 9. We copy. We'll see what we can do for you.
00 01 32 26 CMP Okay, and the heater just came on, and it's going back up again. It looks like it's just tickling the MASTER ALARM there before it decides to heat up.
00 01 32 36 CC Roger, Apollo 9. Copy.
00 01 33 01 CC And, Apollo 9, Houston. That's probably SIM SUP just playing with the tolerances a little bit.
00 01 33 06 CMP Yes, could be.

BERMUDA (REV 2)

00 01 40 15 CC Apollo 9, this is Houston through Bermuda.
00 01 40 19 CDR Roger. Houston through Bermuda. Go ahead.
00 01 40 21 CC Roger. We'd like to uplink you a state vector there, Apollo 9. We - there is a discrepancy between your vectors and ours. We don't have a real good story for you at this time. It was sort of a slow diversion trend, but we would like to slip it in. There are some funnies about the lift-off time, and everything that we're working on, but at this time we'd like to give you a new vector.
00 01 40 43 CMP Okay. Understand you want to give us a new vector on the - Let me see - Stand by.
00 01 40 51 CMP Roger. POO in ACCEPT. You got it.
00 01 40 53 CC Roger. We'll go to work on it. Thank you.
00 01 42 46 CMP Houston, Apollo 9.
00 01 42 48 CC Go, Apollo 9.
Roger. I checked the O₂ purge before I noticed
I didn't check the H₂, so I got the purge heater
on for awhile, and I'm gonna check the H₂ purge.
Might be seeing that.

Roger. You're going to be checking H₂ purge;
and Apollo 9, I have a NAV check to go along
with this state vector when you are ready to copy.

Roger. Stand by on the purge, and stand by on
the NAV check.

Roger. At your convenience.

And, Apollo 9, this is Houston. The computer
is yours. The vector has been transferred,
and it looks good.

Roger. Thank you.

And ready to copy on the NAV.

Roger. Reading the NAV check. Time: 00229 all
zeroes minus 3081 plus 11622 1067. End of update.

Roger. Readback: 00229 all zips minus 3081
plus 11622 1067.

Roger. Houston confirms the update.

Okay.

And, Apollo 9, Houston. We copy your DSKY on the
ground.

Apollo 9, Houston.

Go ahead, Houston.

Roger. Just for your info here, we'll be sending
a command into the IU just to verify our response,
and this will have no effect on you. We are just
trying to troubleshoot our LVDC data, and we don't
want you to move the IU ACCEPT switch; leave it
in BLOCK.
Roger.

Houston, Apollo 9.

Houston, Apollo 9.

Go, Apollo 9.

Roger, Houston. Apollo 9. Do you - We're about ready to terminate our cabin purge. Is that okay with you?

Stand by one, Apollo 9.

Apollo 9, this is Houston. We concur. Go ahead and terminate.

Okay.

 Didn't work.

Roger. Copy.

Houston, this is Apollo 9.

Go, Apollo 9.

We're ready to extend the docking probe. Are you ready?

Oh boy, we are all ears down here. Please let us hear how that goes.

Okay. Fine. It's in work.

Roger.

We got a good one.

Roger. Copy. That makes us all happy.

Roger. It was just like the chamber; we heard it go out, and it took a couple or 3/10 of a second.

Roger. Copy.

And, Apollo 9, this is Houston. We'll fall off at Canaries here in about another minute and we'll see you over Transatrise around 09.
00 01 54 46  CP  Roger. Tananarive at 09.

TANANARIVE (REV 2)

00 02 09 34  CC  Apollo 9, this is Houston through Tananarive.
00 02 09 56  CC  Apollo 9, Houston through Tananarive.
00 02 10 37  CT  Tananarive, Houston. NET 1.
00 02 10 38  CT  Houston, Tananarive.
00 02 10 39  CT  Verify CAP COMM is uplinking properly.
00 02 10 41  CT  That's affirmative.
00 02 10 42  CT  Roger. Thank you.
00 02 11 03  CC  And, Apollo 9, this is Houston. We'll have you over Tananarive for about 5 minutes; we are standing by. I have not heard any transmissions from you here.
00 02 11 14  SC  Okay ...
00 02 11 30  CC  Okay. Apollo 9, Houston. I heard just the first part of that; I'll just stand by here.
00 02 15 24  CC  Apollo 9, this is Houston. We'll lose you in Tananarive here in about 1 minute. If you have tried to call me, I haven't received anything, but we'll see you over Carnarvon at 26.
00 02 15 42  CC  And, Apollo 9, that will be Carnarvon at 26.

CARNARVON (REV 2)

00 02 25 31  CC  Apollo 9, this is Houston through Carnarvon.
00 02 25 36  CDR  Roger. Houston. We're here.
00 02 25 38  CC  Roger. We read you loud and clear. We would like to have the up-telemetry IU switched to ACCEPT.
00 02 25 44  CDR  Go for the puro are anytime you want to run through it.
Roger. We want to take a look at you, and we will give you a GO on that shortly. We would like to have you go ahead and arm the logic at this time.

CDR
Roger.

CC
And would you confirm up-telemetry; are you ENABLED?

CDR
Negative. Up-telemetry IU is in BLOCK. Do you want to go to up-telemetry IU in ACCEPT?

CC
That is affirmative. We would like to have the up-telemetry IU to ACCEPT.

CDR
In ACCEPT.

CC
Understand.

CDR
Roger.

CC
And, Apollo 9, this is Houston. We would like to have you have the up-telemetry IU switched to BLOCK.

CDR
Up-telemetry IU to BLOCK.

CC
Very good. Thank you.

CDR
And, Houston, the logic on my Mark, 3, 2, 1.

CDR
MARK.

CDR
Two logic.

CC
Roger. We copy. Stand by one.

CC
Apollo 9, this is Houston. You are GO for pyro arm.

CDR
Roger. Understand, GO for pyro arm. Thank you.

CC
That is affirmative.

CC
Apollo 9, this is Houston. You are GO for TD and E.

CDR
Roger. Understand, GO for TD and E.

CDR
Houston, what time do we come into daylight?

CC
Do you mean on this pass or for the ejection pass?
This pass.

Okay. Stand by.

Apollo 9, Houston.

Go ahead.

Roger. You will come into daylight on this one at about 02 plus 39 plus 21.

Roger. Thank you.

Here I was all primed for your ejection sunrise time. You faked me out on this one.

Next time I'll ask.

Roger.

Houston, Apollo 9.

Go, Apollo 9.

We have a rather consistent behavior on this number 1 H₂ tank. It appears to light the cryo warning light every time it gets down there before the heater comes on. You might start thinking about how we're going to handle that for the sleep period because it keeps setting off the MASTER ALARM.

Roger, Apollo 9. Copy. And that is in work.

Okay. Thank you.

And, Apollo 9, this is Houston. We will go right on through an ARIA as soon as we come up off of Carnarvon on this one in about 20 seconds.

ARIA (REV 2)

Apollo 9, this is Houston through an honest-to-goodness ARIA. How do you read?

Awa-va-va-va! I got it?

Roger on the va-va's, Apollo 9.
We are going to come into parallel with the 8-IVB in about 6 or 8 seconds.

Houston, we're just about there.

Hello.

Apollo 9, this is Houston. Did you call?

Huntsville AOS.

Huntsville valid two-way lock.

Houston, Apollo 9.

Go, Apollo 9. This is Houston.

Roger. It's out there, and we're turned around and proceeding with the stationkeeping and docking.

Tremendous, Apollo 9. Thank you.

It's a big fellow.

Roger. Copy that.

Apollo 9, this is Houston. We're going to lose you here in about 45 seconds, and we'll see you over Hawaii in about 5 minutes at 51.

Roger.

And we may have an ARIA in here, but if it is like the last one, we won't hear much out of you.

Just a minute. As a matter of fact, we would be better without it.

Okay. We will see you at 51.

And, Apollo 9, this is Houston. We should have you through Hawaii. Standing by.
(Goes Net 1)

00 02 51 07  CDR  Roger.

Redstone (Rev 2)

00 02 52 25  CC  And, Apollo 9, Houston. We've got you through the Redstone. Standing by.

00 02 58 29  CDR  Roger.

00 02 58 34  CMP  Roger, Houston. We are about 25 feet now and ...

00 02 58 41  CC  Copy.

00 03 01 13  SC  That should do it.

00 03 02 07  SC  Alright, Houston. We're hard docked.

00 03 02 11  CC  Roger, Apollo 9. Understand hard dock.

00 03 02 15  CC  Good show.

00 03 02 27  CDR  Hello, Houston. Apollo 9. We had a MASTER ALARM when we did the docking when we made the contact there. And we had some problems with our RCS thrusters we'll tell you about later.

00 03 02 40  CC  Apollo 9, this is Houston. Understand you got a MASTER ALARM just as you docked, and I didn't copy about the RCS.

00 03 02 46  CDR  We'll tell it to you later, just a minute.

00 03 02 47  CC  Roger.

00 03 04 30  CMP  Apollo - Houston, Apollo 9.

00 03 04 31  CC  Go, Apollo 9.

00 03 04 33  CMP  Roger. We'll give you a quick rundown here. How much time do we have with you?

00 03 04 36  CC  We've got you for a long time here. We're coming across the states here - just over California now.

00 03 04 43  CMP  Okay. I've got it. We came out just right. The angles were all just right. We got turned off, turned around, and lined up, and didn't have any LEFT translation for some reason.

00 03 05 00  CC  Roger. Copy. No LEFT translation.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 03 05 06</td>
<td>CDR</td>
<td>Houston, check quad A service module RCS focus.</td>
</tr>
<tr>
<td>00 03 05 18</td>
<td>CC</td>
<td>Stand by a second, Apollo 9.</td>
</tr>
<tr>
<td>00 03 05 24</td>
<td>CC</td>
<td>Apollo 9, this is Houston. It looks okay to us. Do you have a question?</td>
</tr>
<tr>
<td>00 03 05 29</td>
<td>CDR</td>
<td>Roger. We just had a light on it, and it's difficult to tell with the helmets on whether we have any adjustment on it or not. Didn't see any motion - just wanted you to check.</td>
</tr>
<tr>
<td>00 03 05 38</td>
<td>CC</td>
<td>Roger, Apollo 9. Copy.</td>
</tr>
<tr>
<td>00 03 05 43</td>
<td>CDR</td>
<td>Okay. The pressures all look good up here.</td>
</tr>
</tbody>
</table>

END OF TAPE
Houston, our package temp on the quad A is running about 200. What do you have down there?

Stand by, Apollo 9, and let's check it.

Houston, 9. Do you want to go on with the recap?

That's affirmative, Apollo 9. Let's press ahead, and your COMM sort of cycles in and out. You are a little weak at times. We do confirm the temperature here however, and we will have some more words on that in a minute. And we are standing by for the rest of your recap.

Okay. When we got off, we were in pretty good shape and then for some reason we noticed that we didn't have any LEFT translation and tried to figure out why. Finally noticed that the primary quad C and secondary quad C isolation valves were closed, and the secondary Dog was closed, and by this time we had moved over somewhat to the side. It took us a while to get back after we got that sort out and probably used up quite a bit of gas getting us squared away, but the docking was smooth. The capture latches worked just right, there were no oscillations after we captured. We lined it up and did the retract, and it took about 10 seconds, and it sounded like we got a good solid lock.

Roger, Apollo 9. Copied all that real good.

And, Apollo 9, this is Houston. We will have another state vector for you over Bermuda.

Roger.

And you should be coming just about overhead, Apollo 9. You ought to be over Texas.

Roger.

Apollo 9, Houston.

Go ahead, Houston.

Roger. Could you give us POO in ACCEPT, please? We have a state vector for you, and I have a NAV
check when you are ready to copy. And we would also like to have your opinion as do you think you will have any problem continuing on the timeline through ejection with this situation.

00 03 14 13 CMP Okay. You have got POO in ACCEPT.

00 03 14 16 CC Roger.

00 03 16 28 CC Apollo 9, this is Houston. The computer is yours, and that quad A temp has dropped about 8 degrees now coming across the States, and we’re keeping an eye on it.

00 03 16 39 CMP Okay, Houston. Stand by. We’re briefing.

00 03 20 45 CC Apollo 9, Houston. We’ve got you for about another minute. We’ll see you over Ascension, around 28. We would like to have you to go BLOCK on your command module telemetry, and you don’t have to slip a NAV check. We’ve checked your vector, and it’s good.

00 03 21 30 CC Apollo 9, Houston. You’re way down in the mud. Try again.

ASCENSION (REV 3)

00 03 28 57 CC Apollo 9, this is Houston through Ascension. Standing by.

00 03 29 03 CMP Roger.

00 03 29 04 CMP Roger. We are mating the umbilicals right now.

00 03 29 07 CC Roger. Understand you are connecting the umbilicals.

00 03 29 58 CC Apollo 9, this is Houston. We are going to have you for about another minute here at Ascension, and then we’ll see you over Tananarive at about 44, and we would like to know the time of when you transfer to the CSM power, and I have a sunrise time any time you want it.

00 03 33 17 CMP Roger. We transferred to CSM power at 3 hours 33 minutes and 0 seconds.
Tape 3/3
Page 22

(0033 NET 1)

00 03 32 25 CC Very good. Thank you.
00 03 33 36 CMP Houston, what oscillation reading on the systems test meter through the LH power to about a half a volt to sometimes up to 3 volts. It's in slow oscillation maybe every 10 seconds or so.
00 03 33 51 CC Roger. Copy. It's varying from a half to 3 volts slowly. Thank you.
00 05 34 00 CMP Roger. Pops open, and pops back down sometimes to two.
00 03 34 04 CDR There is some smaller oscillations that occur at a period about every second. It's been about 2 or 3/10 of a volt.
00 03 34 18 CC Roger. Copy small oscillations 2/10 to 3/10. Thank you. And we'll see you over Tananarive, 44.
00 03 34 31 CMP Roger. And what was the sunrise time, Houston?
00 03 34 35 CC Sunrise time is 04 plus 08.
00 03 34 39 CMP Roger. 04 plus 08.

TANANARIVE (REV 3)

00 03 44 00 CC Apollo 9, Houston through Tananarive.
00 03 44 28 CC Apollo 9, Houston through Tananarive. Standing by.
00 03 44 39 SC ...
00 03 44 50 CC Okay, Apollo 9. I heard you answer me, but it's unreadable at this time.
03 03 44 56 CDR Roger. The tunnel is closed out, the hatch is in, we are preparing for ejection.
00 03 45 03 CC Roger. Copy. The hatch is closed out, and you are pressurizing.
00 03 48 20 CC Apollo 9, this is Houston. We're losing you here at Tananarive. We'll see you over Carnarvon at about 59.
Apollo 9, this is Houston through Carnarvon.

Apollo 9, Houston through Carnarvon.

Go ahead, Houston. Apollo 9.

Roger. We have got you now in good voice contact. We will be giving you your GO here shortly and take a look at you.

Okay. Very good.

And Apollo 9, we would like to have you arm the logic busses.

Roger, Houston. You ready?

That's affirm.

... logic coming on now. Two logic ON.

Copy. Stand by one. And, Apollo 9, you are GO for pyro arm.

Roger. Understood, and understand the ejection at 4 hours 11 minutes. Is that correct?

That's a - negative. We - I gave you the sunrise time here as 06 plus 08.

Roger. You want us to go on sunrise or at 04:11?

Apollo 9, this is Houston. We would like to have you go at sunrise.

Roger. Understand.

And, Apollo 9, Houston. That will put your evasive maneuver at 04 plus 11.

Roger.

Houston, 9.

Go, Apollo 9.

Listen, if you concur, we would sort of like to wait until we have good sunlight before we come off of that.
00 04 00 35 CC Roger. We concur with that. Use your judgment.
00 04 00 39 CDR Okay. Thank you.
00 04 00 41 CC And, Apollo 9, we're still showing your command module telemetry switch in ACCEPT. We would like to have you go BLOCK on that.
00 04 00 56 CDR Roger.
00 04 00 58 CC Roger. Thank you.
00 04 02 25 CC Apollo 9, this is Houston. You are GO for ejection.
00 04 02 29 CMP Roger. Go for ejection.
00 04 05 25 CC Apollo 9, this is Houston. You are coming off of Carnarvon here, but we will be monitoring your ejection through an ARIA.
00 04 05 37 CMP Roger. Those ARIA's make an awful lot of noise, Houston. We have trouble hearing each other.
00 04 05 42 CC Roger. Copy.
00 04 06 25 CMP ... very loud and making all kinds of noise and --
00 04 06 31 CC Apollo 9, Houston. Say again.
00 04 06 36 CDR Houston, Apollo 9. You are making very much noise in VHF, and it would be better if we do not do it this way.
00 04 06 45 CC Roger. Understand that you want the ARIA down. Is that affirmative?
00 04 06 50 CDR I think that would be better if the ARIA is out of it.
00 04 06 54 CC Okay. Copy.

HUNTSVILLE (REV 3)

00 04 14 30 CT Huntsville VOS.
00 04 14 54 CT Huntsville. Valid two-way.
00 04 15 18 CDR Houston, Apollo 9.
Go, Apollo 9. This is Houston.

Okay, Houston. You're coming in very weak, but be advised we had a successful ejection and we are presently separating very slowly from the S-IVB. We've got them in sight out of all of the windows.

Sounds beautiful. Could you give me your ejection time, please?

Okay, Houston. If you can read - the ejection time was 4 hours 8 minutes and 5 seconds.

Say the minutes again, please, Apollo 9. Just the minutes.

Huntsville does not have valid two-way. Clearing signal.

And, Apollo 9, this is Houston. If you read - we did copy your transmission of a successful ejection. You are moving away. We did copy the time, but we would like for you to verify the minutes - if you can try it again.

Houston, this is Apollo 9. Say again, please.

Roger. Would you give me your ejection time again, please?

Roger. It was 08:05.

Roger. We copy. Thank you, and we'll see you over Hawaii at about 24.

Roger.

And, Apollo 9, this is Houston. If you can read me, the S-IVB maneuver time is 25 plus 04.

Roger. 25:04.

Very good. We're talking to each other again.

Huntsville LOS.

Apollo 9, this is Houston through Hawaii.
Apollo 9, this is Houston. Standing by.

Apollo 9, Houston through Hawaii.

Apollo 9, Houston through Hawaii.

Roger, Houston. We've been sitting here watching the S-IVB maneuver, and it's just about 90 degrees to our line of sight now.

Roger. The COMM is beautiful now, Apollo 9; we had dropped our GSSS Conference was the delay. And I would like to pass you the ignition time for the S-IVB.

Roger. Go ahead.

Roger. Stand by one here. We might get a better one.

Apollo 9, Houston.

Go ahead, Houston.

Roger. We are showing the S-IVB restart at 04 plus 45 plus 56.

04:45:56.

That's affirmative.

Apollo 9, this is Houston. The S-IVB has completed its maneuver, and we would like to have a GO from you to release the maneuver inhibit - the restart inhibit.

Say that again, Houston. Apollo 9.

Roger. The S-IVB has completed its maneuver, and we are standing by for its ignition. We would like to have a GO from you to release the restart inhibit.

Roger, Houston. Apollo 9, here. We've just announced that we are quartering to the rear and above, and you have a GO for restart inhibit.

Apollo 9, this is Houston. You're fading. Stand by about a minute and we'll pick you up better.

REDSTONE (REV 3)

And, Apollo 9, this is Houston. We've got you now through the Redstone, and you were faded out on your last transmission there.

Roger. You have a GO to release the restart inhibit.

Roger, Apollo 9. We copy that. Thank you.

Houston, Apollo 9. Do you read me?

You are a little weaker than Rusty, Jim. Go ahead.

Okay. I just was wondering; you weren't answering some of my transmissions. We are quartering behind and above at the present time, and you do have that GO.

Okay. Thank you, Jim. We got it. Your last transmission was an AHIA at LOS coming off Hawaii there; we had about a 40-second break here.

Alright.

But, I've got you real good now.

And, Apollo 9, this is Houston. If you got the time, could you give me a guess at the range from the S-IVB?

It's a pretty tough question.

Okay. I thought it might be. I was just curious for a guesstimate.

We are about a couple thousand feet or so, I'd guess ...
Okay. Thank you.

Looks like it's going to be right down the tailpipe.

That ought to be a good view.

No smog in LA today.

Did you say that it was smoggy, Apollo 9?

Doesn't look like it; looks pretty clear.

Very good.

... I missed what Jim said there.

Houston, we're down what looks like about 1000 feet or so.

Understand you are now at 1000 feet. Is that affirmative? Does it look like you are closing?

Well, just climbing up above. He's just crossing the horizon with respect to us, so he's going to get up above us again and then come back around us.

Houston, we're going to be just about down his tailpipe. It looks like about 1000 feet or so.

Roger. Copy. Right down to tailpipe and about 1000 feet.

Does that look like a good place?

Stand by one. It's better than being right off the nose, but let's see what somebody says here.

Okay, Apollo 9, this is Houston. It's our understanding that the places not to be are directly above or below inside of 500 feet, so with that criteria, it sounds like you are doing okay.

Alright.
REDSTONE (REV 3)

00 04 38 53 LMP Houston, against the black sky you can really see the APS firing away.

00 04 39 00 CC Roger. Copy.

00 04 39 05 CC And, Apollo 9, when your lead cuts in its after-burner you're expected to keep up.

00 04 39 12 CDR No thanks.

00 04 39 14 CC Okay.

00 04 39 17 LMP Give us about an hour.

00 04 43 33 LMP Houston, Apollo 9. It looks like we have slid down enough below them now so they are not going to be thrusting right at us with the engine.

00 04 43 41 CC Roger. Understand you are a little below, and I will wait until after this burn, of course, but I do have your SPS-1 PAD when you get squared away after this burn. Okay?

00 04 44 03 LMP Houston, what time should we begin to see the ullaging of the venting?

00 04 44 11 CC Stand by, Apollo 9.

00 04 44 20 CC Apollo 9, this is Houston. You should see it start in about 15 seconds from right now.

00 04 44 26 LMP Okay. Thank you.

00 04 44 28 CC Roger.

00 04 44 40 CC Ullage ON, Apollo 9.

00 04 44 45 LMP Roger. Understand. Ullage ON, and we don't see any change yet.

00 04 44 50 CC Roger.

00 04 45 01 CC MARK.

00 04 45 02 CC One minute to ignition.

00 04 46 03 CC We show ignition on the E-IVB.

00 04 46 06 LMP It's on the way.
<table>
<thead>
<tr>
<th>Time</th>
<th>CDR</th>
<th>CC</th>
<th>LMF</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>00 04 46 15</td>
<td>CDR</td>
<td>It's just like a bright star disappearing into the distance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 46 24</td>
<td>CC</td>
<td>Is there quite a bit of debris kicked out there, Apollo 9?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 46 28</td>
<td>CDR</td>
<td>Looked like a real clean burn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 46 29</td>
<td>LMF</td>
<td>You could see a lot of stuff coming out when he just started up, but then it just went into a nice bright light.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 46 37</td>
<td>CC</td>
<td>Beautiful!</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 46 39</td>
<td>LMF</td>
<td>We got some movies, but I'm not sure they're going to be too good. He's pretty far out there.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 47 10</td>
<td>CC</td>
<td>And the S-IVB has shut down, Apollo 9?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 47 15</td>
<td>CDR</td>
<td>Roger. We're just a speck in the distance right now.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 47 18</td>
<td>CC</td>
<td>Okay. Now that we've got him out of the way, back with the business at hand. I'm ready to read SPS-MAD any time.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 47 27</td>
<td>CDR</td>
<td>Okay. Stand by just a minute.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 47 52</td>
<td>CC</td>
<td>Apollo 9, this is Houston. Could we have P30 and ACCEPT? We'd like to start you up a target lead.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 47 59</td>
<td>CMP</td>
<td>Roger. You got it.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 48 01</td>
<td>CC</td>
<td>Understand. We got it.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 48 02</td>
<td>CMP</td>
<td>Roger.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 48 10</td>
<td>CDR</td>
<td>Okay, Houston. Ready to copy the P30.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 48 13</td>
<td>CC</td>
<td>Roger. Starting with the P30, and there will be about a minute delay on the target lead. We're going to switch stations. Starting now on the maneuver PAD. SPS-1: 005 59 all zips, plus 00000 all zips all zips 00368 00324 0051 98 849, plus 100, minus 020 17 13.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 49 23</td>
<td>CMP</td>
<td>Houston, Apollo 9.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 49 27</td>
<td>CC</td>
<td>Go, Apollo 9.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>00 04 49 30</td>
<td>CC</td>
<td>Go, Apollo 9.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Roger. You cut out very badly in that. I got TIG and I got DELTA-V_y and DELTA-V_h and DELTA-V_C and that's all I got.

Okay. We'll try you again. Now are you reading me okay?

Roger. Reading you okay now. Stand by just a minute.

Okay. Go ahead again.

Say again, Apollo 9.

Roger. Go ahead with your PAD.

Okay. I won't read the TIG again. That's 55900, and reading the DELTA-V_y, plus 00368, and are you with me?

Yes I am, and that's as far as we got last time.

Okay. All zeros for DELTA-V_y, all zeros 00368 00324 0051 58 840, plus 100, minus 020 17 13 520 33 100.

Houston, Apollo 9.

Go, Apollo 9.

Roger. The last thing I got was 58 840; you got any more?

Roger. We'll try you again here. Stand by one here.

Okay. Apollo 9, Houston. How do you read?

Reading you five-square, Houston.

Okay. You're coming in a little weak. Understand you got up through CSM weight; is that affirmative?

That's affirmative.

Okay. Reading PITCH TRIM: Plus 100, minus 020 17 13 520 33 100. End of the PAD.
Roger. Readback: 00559 all zips, plus 00368 all zips 00368 00324 0051 58 840, plus 100, minus 020 17 13 520 33 100.

Houston confirms the PAD. I would also now like to give you your gimbal angles used in the PAD REFSD for PG-1.

Roger. Go.

Roger. It's roll 00, pitch 359, yaw 001.

Roger. Understand, 000 359 001.

And this is affirmative; Houston confirms.

Roger.

And is the computer yours? Did you get the P27 in?

The computer is yours, Apollo 9.

Roger. Thank you.

Okay.

ASCENSION (REV 4)

Apollo 9, this is Houston through Ascension.

Roger, Houston. This is Apollo 9. Reading you loud and clear.

Roger, Apollo 9. We'd like to update your state vector again, if you could give us POO and ACCEPT.

Roger. You have POO and ACCEPT.

Roger. And a couple of items: There is a bias in your X-PIPA, and we are taking a look at this. The only steps we would like to do at this time would be to recommend that you stay in average 6 as little time as possible. We are estimating that during the SPS-1 burn, there will be an error of about a foot and a half, and so the only thing we will do at this time is you just come out of average 6 as soon as possible, and we will talk about this later after the burn.

Okay. And we have another problem here. Our 8.
to have a steady-state flow around 7-8/10 pounds per hour. We don't have the vent open yet - the waste management vent, but we do have the LM pressurization on, and I'm wondering if you could give us a clue as to whether you think we have a leaky LM or what.

00 05 04 07 CC Roger. We copied the transmission, Apollo 9. And stand by for some words of wisdom on that.

00 05 04 17 CMP We're getting the MASTER ALARM light on every few minutes here, either from the hydrogen-cryo or the O₂ FLOW HIGH. It is almost like the simulator.

00 05 04 30 CC Roger. That is a shame.

00 05 04 44 CC Apollo 9, Houston.

00 05 04 48 CMP Go ahead.

00 05 04 49 CC Roger. We'd like to have the fans in H₂ tank I turned on manually at this time, and just leave it on. We will leave it on for a while and take a look at it.

00 05 05 01 CMP Okay. Very good. We'll turn the fans on.

00 05 05 03 CC Okay. And we would like to know if you can see the docking angle index when you were up in the tunnel.

00 05 05 11 CMP Negative. I didn't look.

00 05 05 14 CC Okay.

00 05 05 35 CC Apollo 9, this is Houston. The computer is yours and I have a state vector - I mean aNAV check to go along with that state vector.

00 05 05 46 CDR Roger. Stand by.

00 05 06 10 CMP Okay, Houston. Ready to copy your NAV check.

00 05 06 13 CC Roger. Disregard, Apollo 9. We have checked it here on the ground. Unless you want it, I won't read it to you.

00 05 06 29 CC Apollo 9, did you copy?

00 05 06 33 CMP ... Houston. We won't need it.
Okay. We won't read it. We are going to have you for about another minute at Ascension, and then we will see you over Tananarive at 19.

Roger.

Apollo 9, Houston.

Go ahead, Houston.

Roger. We would like to have you turn off the depressurization valve to see if that takes care of the O₂ HIGH FLOW.

Roger. We will catch that in a few minutes and advise you.

Okay.

Apollo 9, Houston.

Go ahead, Houston.

Roger. We want you to go back to 130 - 140 again to recompute that REFSMMAT after this uplink.

HELLO, APOLLO 9, THIS IS HOUSTON THROUGH TANANARIVE.

Apollo 9, this is Houston. If you read me, we'll see you over Carnarvon at around 32.

Hello, Apollo 9, this is Houston through Tananarive.

Apollo 9, this is Houston. If you read me, we'll see you over Carnarvon at around 32.

CARNAVON (REV 4)

Apollo 9, Houston through Carnarvon.

Roger, Houston.

We're reading you loud and clear.

... angles if you are ready to copy.

Go ahead.

... GET of 15, 1830, plus 00153, plus 00333, minus 00638.
(0033 REV 1)

00 05 33 21   CC   Roger, Apollo 9. I copy that.
00 05 33 26   CDR   Roger.
00 05 33 52   CC   Apollo 9, this is Houston. You are GO CPS-1.
00 05 35 57   LMP   Roger, Houston. ... GO for CPS-1.
00 05 37 03   CC   And, Apollo 9, Houston.
00 05 37 08   CDR   Houston, Apollo 9. Go ahead.
00 05 37 10   CC   Roger. Just a word of info to close out that item on the power going into the LM. That duty cycle has not settled down and is exactly the same as the duty cycle was prior to launch. So everything is good on the LM power. And it's 5 on and 28 off.
00 05 37 31   CDR   Real fine. Thank you.
00 05 37 33   CC   Roger.

GUAM (REV 4)

00 05 44 11   CC   Apollo 9, this is Houston through Guam. Standing by.
00 05 44 17   LMP   Roger, Houston. We're mushing through a checklist here.
00 05 48 03   CC   Apollo 9, Houston. I will have you here for about another 2-1/2 minutes, and I have got a couple of words of wisdom on your attitude on this burn - why you are going to be off a couple of degrees in pitch and a couple of degrees in yaw if you want me to give them to you.
00 05 48 18   LMP   Go ahead.
00 05 48 20   CC   Okay. Your REFSMAT is off slightly and we think this may have come about by the order in which you loaded the DAP in relation to the P52. However, we have taken a look at this and we are saying at burn attitude you are going to have zero roll, a pitch of 358, and a yaw of about 002, and this will give you the right burn. It's just you won't be at 000 on the bell.
00 05 49 05   CDR   Roger, Houston. Thank you very much.
00 05 49 08    CC    Roger.
00 05 49 56    CMP    Houston, this is Apollo 9.
00 05 49 58    CC    Go, Apollo 9.
00 05 50 01    LMP    We seem to have our O₂ thing in hand now. We have closed the tunnel thing and we also ... suit ... valve, and one of us had our helmet off for just a moment there and that was contributing to it, too. So it looks like we have the O₂ problem in hand.
00 05 50 26    CC    Roger. We copy that. Some of it was dropped out. I am about to lose you here. We will see you over Hawaii at 57.

HAWAII (REV 4)

00 05 57 43    CC    And, Apollo 9, this is Houston. Standing by for you burn.
00 05 57 48    CMP    Roger, Houston. Apollo 9. A minute 10 seconds, ready to go.
00 05 57 53    CC    Roger.
00 05 59 16    CMP    Burn complete.
00 05 59 18    CC    Roger. Copy. Burn complete.
00 05 59 42    CC    And, Apollo 9, Houston. I copy your residuals: plus 1.8, plus 0.5, minus 0.2.
00 05 59 48    CSP    Roger. That's affirmative. And the EMS was minus 4.2.
00 05 59 53    CC    Roger. Minus 4.2.
00 06 02 02    CC    Apollo 9, Houston. In about 30 seconds we'll lose you off Hawaii and have you back at Redstone about a minute later. There will be a break in there, and then we'll pick you up for a long pass.
Apollo 9, this is Houston through Redstone. We ought to have you now on a long stateside pass.

Apollo 9, Houston through Redstone. How do you read?

Houston, Apollo 9. How do you read?

You're down a little bit, Dave, but I'm reading you okay. We've got you through the Redstone now, and it should be a nice long pass.

Houston, Apollo 9. You are unreadable.

Roger. You're about the same. Stand by one here. I think we'll get better here in a couple of minutes.

Apollo 9, this is Houston. How do you read now?

Apollo 9, this is Houston. Trying again; how do you read?

Apollo 9, Houston. Do you read?

END OF TAPE
00 06 13 22  CC  Apollo 9, Houston through Texas. How do you read?
00 06 13 25  CDR  Roger. Houston, Apollo 9. We read you loud and clear. How about us?
00 06 13 28  CC  We're reading you five-square. We just went the S-IVB hyperbolic and got it out of your way.
00 06 13 31  CDR  Very good. We were reading you all along there. I guess you just weren't reading us.
00 06 13 35  CC  Roger. Guess we had some of our receivers tuned in on the S-IVB there, that I didn't know they had taken away from me.
00 06 13 47  CDR  Okay.
00 06 13 48  CC  When you get squared away after the burn, I've got your star count update for you.
00 06 14 13  CDR  Okay.
00 06 14 17  CDR  Okay, Houston. Go ahead with the update.
00 06 14 21  CC  Roger. Star count update: 006 49 4500 068 - 0680 if you want the decimal there - 2911 3302. End of update.
00 06 14 44  CDR  Roger. Understand. 006 49 4500 0680 2911 3302.
00 06 14 54  CC  That's affirmative. Houston confirms the update and would like to have you go ahead and open up the LI pressurization valve, if you concur.
00 06 15 04  CDR  Roger. We tried to get ahold of you before to tell you we're going to do it, so we'll open it up at this time.
00 06 15 10  CC  Okay.
00 06 15 25  CDR  Houston, Apollo 9.
00 06 15 28  CC  Go, Apollo 9.
00 06 15 31  CDR  How are we making out on RCS as opposed to MANUAL? What I'm wondering about is whether or not we should do the star count.
Roger. Stand by one.

Apollo 9, Houston.

Go ahead.

Roger. We're down a little bit, but we've got an excellent margin, and nobody is sweating it at all, Jim. We recommend that you go ahead and do this star check.

Okay.

Houston, Apollo 9.

Go, Houston.

Let me give you an UP on the SPS PU system there. Following the burn, I'm reading 89.2 percent in oxidizer and 93.7 in fuel and an unbalanced pegged on the decreased side.

Roger. Copy 89.2, 93.7, and the unbalanced pegged on the decreased side.

Roger. And for your information, the ISLV vent, SPS injector valve A-1 opens slower than A-2.


Apollo 9, this is Houston. We are about to lose you here. We will pick you up over Tananarive at 51.

Rogan. Tananarive at 51.

Hello, Apollo 9. This is Houston through Tananarive. Do you read?

...
Okay, Apollo 9, this is Houston through Tananarive. We're probably not getting you here. We got about another minute and a half, and if you can read me, we'll see you over Guam at about 17.

Roger, Houston. This is Apollo 9, and we're reading you loud and clear through Tananarive. We'll look for you over Guam. How do you read me?

Oh, we're getting you in here now. I didn't read you at all the first time or two around.

Okay, I heard your call a couple of times, but I guess we just weren't getting down to you.

Roger. It hasn't been too stern here off Tananarive today.

Okay. We're just taking a little time out to eat here right now. We haven't had anything to eat yet ...

Okay, our plan is that as we come over Guam and back across the States, why, we'll discuss all our systems problems and so forth before you go to sleep tonight.

Roger.

And we speak Sayonara at Tananarive. See you over Guam.

Roger.

Apollo 9, this is Houston through Guam.

Hello, Houston. Apollo 9, here.

Roger. We would like to have POO and ACCEPT, please. We are going to give you a state vector.

Roger. You have POO and ACCEPT.

Roger.
00 07 18 32 CC  And, Apollo 9, this is Houston. Can you talk a few minutes here? We are going to have you over Guam for about 5 minutes.

00 07 18 39 CDR  Sure, go ahead. What shall we talk about?

00 07 18 41 CC  Okay, stand by one just a second.

00 07 18 48 CDR  What I want to talk about is that X-PIPA bias.

00 07 18 52 CC  Okay, we will take that one first. We are showing an error in that X-PIPA of about 0.04 feet per second squared. The plan is to not do anything with that tonight, and we will update that tomorrow prior to the first burn.

00 07 19 11 SC  Okay, is it within the tolerance of what you can update?

00 07 19 13 CC  Yes it is. That is affirmative.

00 07 19 18 CDR  Okay, very good.

00 07 19 20 CC  Okay, that takes care of that. I would just like to ask a fast question. You haven't mentioned it. I assume that you have no reading on that RCS helium pressure that's still gone.

00 07 19 34 CDR  That is affirmative, and still reading FULL SCALE LOW.

00 07 19 37 CC  Okay, very good. Another item on this MASTER ALARM on the hard docking. We don't have you a good explanation; however, we do have some info in from Cape that this was found on spacecraft 106 when they docked, and they didn't find out why. But they did get an unexplained MASTER ALARM when they docked down there with 106.

00 07 20 05 CDR  Okay.

00 07 20 07 CC  And we are going to replay the data when you dock to see if we can get anything out of it; but we can not close the loop on that one at this time.

00 07 20 18 CDR  Okay. Do you have any idea what could have caused our primary and secondary propellant valves to go closed?
I think you must be looking at my sheet here, Jim, because that was my exact item coming up next I would like to ask you. We feel that two explanations, one was a stray electrical current there that actually did it, or do you feel that you could have bumped the switches when you were changing seats?

No, I don't think so because, I don't think we could have bumped them because we did an RCS check after that, and it was dark in here but I looked through all of the quads and I looked at all the talkbacks. The talkbacks looked okay. It is possible but not very probable that I missed all three of those talkbacks. I was wondering if we couldn't have had the joint from the separation between the service module and the SIA caused them to go closed. I can't imagine that we would only have one of the talkbacks on the D-quad go closed for any other reason.

Okay, that was something we wanted to verify - that the talkback that was closed on quad Delta was the secondary propellant.

Roger. C had primary and secondary closed, D or Delta had just the secondary closed.

Okay, we copy that, and we agree with you. We are really at a loss how the secondary propellant only talkback could have gotten in that condition.

Okay.

So that is something that we will have to think about here over the night.

All right. Be advised of one other thing. Sort of keep track of the venting - cabin vent. We didn't go back to waste the vent overboard until 07:15. We didn't get that open again until then.

And you know when we closed it, it was just prior to the docking.
Roger. Okay, and that is okay. Next item is, I would just like to - We are closing this out about that IM power cycling. That is running, as I mentioned before, just exactly on the cycle that we would expect and the way it was going on the PAD.

Okay, fine.

Okay, we have some other things. We will pick them up here over Hawaii at about 32. I have a minute left, and I have a N/A check to go with this state vector we just passed you.

Stand by one. We are going to have to sort through the food bags for a piece of paper.

Okay. Understand. And the computer is yours.

Okay, Houston. Go ahead with the N/A check.


Roger. Understand. 00810 all zips 92719, plus 02980.

Okay, Apollo 9. You went over the hill with everything confirmed except the altitude, and we will see you over Hawaii.

HAWAII (REV 5)

Greetings, Apollo 9. This is Houston through Hawaii.

Roger. Houston, Apollo 9.

Roger. I didn't get to confirm all your N/A checkout. If you ran it, you have probably discovered the sign was wrong on the longitude.

Oh, we're glad you knew that.

Say again, Apollo 9.

Roger. We discovered that.
00 07 32 53 CC  
Roger. And I guess the – Did the rest of it go okay?

00 07 32 56 CMP  
That's affirmative. Right on the money.

00 07 32 59 CC  
All right. And are you free to talk now?

00 07 33 06 CMP  
Roger. Go ahead.

00 07 33 08 CC  
First, is this cryo tank. What we would like to have you do at this time is turn off fans – the fans and heaters in both H₂ tanks. And want to let the pressure drop down to 200 and then have you manually maintain that at 200 until you power down. And after you're powered down, just before sacking out, we are going to turn on the fan in H₂ tank 1, and the estimates on this one is that it will slowly build up the pressure and when you wake up in the morning it will have built back up to 235 and it will keep the MASTER ALARM from coming on through the night.

00 07 33 58 CMP  
Okay.

00 07 34 05 CC  
Okay. Are we squared away on that, Apollo 9?

00 07 34 09 CMP  
Okay, you want us to turn the heaters and fans off on both the H₂ tanks, and when do you want us to do that, now?

00 07 34 15 CC  
You can do that right now.

00 07 34 17 CMP  
Okay. Fine.

00 07 34 21 CC  
Okay. Very good. We would also – have you started a charge on battery B?

00 07 34 30 CMP  
Negative, we weren't going to start the charge until we went to sleep. ... charge on battery B.

00 07 34 43 CC  
Okay. We will go ahead and agree with that, Apollo 9.

00 07 34 49 CMP  
Okay. We're going – You're going to call us and tell us to turn it on just before we go to sleep. Is that right?

00 07 34 54 CC  
Okay.
And Apollo 9, this is Houston. You are GO for 19 dash 1.

Roger. Understand we are GO for 19 dash 1.

Okay, and this 02 FLOW HIGH readings you were setting - We consider that a closed item. How do you feel on this one, Apollo 9?

I think it is a closed item also.

Okay, and on Rusty's comment on SPS-1, our data shows that both ball valves opened right on the money - opened together.

Okay, fine. We may have just had a sticky gage in the cockpit. How about PI-CON valves that we have on the quantity gage?

Okay. This one we will have to look at some more. We don't believe that it is a valid reading at this time, Apollo 9. That - On that short of a burn, we feel that the PI-CON worked for such a short time that it probably didn't get a valid reading, and we don't believe that.

Yes. That sounds pretty logical.

Okay. And on SPS-1 everything - It was a nominal burn. GNC is real happy; the PC and everything else looks real good, so that - Looks like we are in fine shape on it.

Okay. Very good.

Okay, we are about to lose you here for about a couple of minutes and we will see you over the Redstone about 38.

REDSTONE (REV 5)

Okay. Apollo 9, this is Houston. We should have you through to Redstone now.

Apollo 9, this is Houston through the Redstone. How do you read?
00 07 38 47 CMP You are weak but clear, Houston. Go ahead.
00 07 38 50 CC You are coming in clear, are. Okay. We would like to have you go back to BLOCK on your ON telemetry.
00 07 40 02 CMP Roger. BLOCK. Let me ask you a question about the other H₂ tank. If we run them both down to 200, and we turn the fan on in H₂ tank number 1, what are we going to do with tank number 2?
00 07 40 15 CC We expect it will --
00 07 40 25 CMP I didn't get that answer.
00 07 40 29 CC Apollo 9, this is Houston. I copied that; would you stand by, one?
00 07 40 31 CMP Roger.
00 07 41 11 CC Apollo 9, Houston.
00 07 41 14 LMP Go ahead.
00 07 41 15 CC Okay. Copy your question, and what we're -- What we're saying is that the pressure will stay equal in tank 2 just due to the heat leak, even though we are feeding primarily out of tank 1, but that pressure should come up right along with tank 1.
00 07 41 35 LMP Okay.
00 07 41 42 CC And also we would like -- Could you verify that the surge tank is on the line?
00 07 41 51 LMP Roger. The surge tank is.
00 07 42 04 CC Okay. Very good, we just noticed that coming up a little slow.
00 07 42 18 CC Yes. It sure is coming up slow, isn't it?
00 07 42 26 LMP Stand by.
00 07 42 18 CC And, Apollo 9, we are showing you about 60 degree yaw now; just wanted to mention that.
And, Apollo 9, this is Houston. That just about closes out my list here. I hit it briefly back there, unless you have any questions about my comments on that 2-degree pitch and yaw on the attitude for EPS-1.

We have nothing. What was your comment about ...

Stay again, Apollo 9.

Were you saying you were going to take the gimbal ... off?

Boy, you are really coming in scratchy here on this one, Apollo.

Okay, I think we have it - I think we understand what you said.

Okay. And that cleans us up here, Apollo 9. Have you got anything you would like to toss in here across this PAD? This is about the last time we plan on doing much talking to you.

No. I don't - I guess it is just the general comment we were pretty well crowded today to get all of these things in, so we sort of missed lunch.

Roger. I could tell you were really humping up there. Pretty busy day.

And Apollo 9, Houston. We'd like to verify the canister change at 6:30.

It's in the process of being changed right now.

Roger. Copy.

Apollo 9, Houston.

Apollo 9, Houston.

Apollo 9, Houston. How do you read?
FREITORIA (REV 6)

00 07 46 26  CDR  Go ahead, Houston. Apollo 9. We are reading you loud and clear.
00 07 46 32  CC  Okay. We have got you in here now. Two other items; we would like to get an E memory dump from you to give us some homework here tonight if you can give us a Mark and take that.
00 07 46 43  CDR  ... E memory dump ...
00 07 46 47  CC  Wait. Stand by, Apollo 9; our telemetry just dropped out.
00 07 46 51  CDR  Okay. We would like to know when you would like us to start charging the battery.
00 07 46 57  CC  Okay. You can start it - you can start it any time prior to sacking out. We are going to lose you here in about another minute and the only other time we will talk with you before sack time will be over Tananarive which will hit there at 24. So, you can - You can start anytime you want.
00 07 47 16  CDR  Okay, fine. Do you want that E memory dump now or do you want to just skip it?
00 07 47 20  CC  No, we are standing by now. Go ahead and let her run.
00 07 47 23  CDR  Okay. Stand by.
00 07 47 44  CMP  It's - Houston it's ... memory dump is on the way.
00 07 47 48  CC  Okay. Roger. Copy. And one other item, over Tananarive, if you can, we would like to have a FRA readout from each one of you.
00 07 48 31  CC  And we will see you over Tananarive at about 24 or 25.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(Tape 6/8)

Page 6

TEXAS (REV 6)

00 07 48 35 CDR Roger. Thank you, and we will get a PRD report as soon as we figure out what it is. And we're charging battery D right now for you.

00 07 48 49 CC Okay. And that's a dosimeter reading over Tananarive.

TANANARIVE (REV 6)

00 08 25 02 CC Apollo 9, this is Houston through Tananarive.

00 08 25 07 CMP Roger. This is Apollo 9. Go ahead.

00 08 25 10 CC Roger. I am not reading you very good at all, but are you reading me well enough to take your block data. I am ready to send that if you can read it.

00 08 25 20 CMP Roger. Stand by just one.

00 08 25 24 CC Okay.

00 08 25 44 CMP Okay, Houston. Go ahead.

00 08 25 47 CC Roger. Reading block data number 2: 008 Bravo, plus 256, plus 1450, 013, 1431, 29, 28, 010. Okay, Charlie Charlie, minus 195, minus 1617, 015, 0251, 29, 28, 011. Alfa Charlie, plus 008, minus 0750, 015, 4024, 29, 28. And am I coming through well right, Apollo 9?

00 08 27 37 CMP Roger. What was the first area?

00 08 27 42 CC Okay. I've still got some more for you, but my first area was 009 3 Bravo.

00 08 27 56 CMP Roger. Ready to continue.

00 08 27 59 CC Okay, continuing on: 012 Alfa Charlie, plus 101, minus 0321, 017, 1349, 29, 28, 0132. Alfa, plus 250, minus 0264, 018, 5057, 29, 28, and the last one 014 Alfa Charlie, plus 308, minus 0279, 000, 2410, 29, 28. That is the end of the block data, and your SPS trim angles for this: pitch minus 137, yaw plus 135, and that is the end of the block data. Before you start the readback, there are a couple of other comments for you.
<table>
<thead>
<tr>
<th>Time</th>
<th>Source</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 08 30 00</td>
<td>CMP</td>
<td>Okay. Go ahead.</td>
</tr>
<tr>
<td>00 08 30 03</td>
<td>CC</td>
<td>Roger. We'd like to have you verify that you will do a waste water dump down to 25 percent prior to the rest period.</td>
</tr>
<tr>
<td>00 08 30 13</td>
<td>LMP</td>
<td>Roger. Waste water dump down to 25 percent prior to rest period.</td>
</tr>
<tr>
<td>00 08 30 19</td>
<td>CC</td>
<td>That is affirmative, and we'd like to have a dosimeter reading, if you've got it.</td>
</tr>
<tr>
<td>00 08 30 30</td>
<td>LMP</td>
<td>Roger. Stand by.</td>
</tr>
<tr>
<td>00 08 30 55</td>
<td>LMP</td>
<td>Okay. The LMP dosimeter is 8001.</td>
</tr>
<tr>
<td>00 08 31 03</td>
<td>CC</td>
<td>Roger. Go - go ahead.</td>
</tr>
<tr>
<td>00 08 31 09</td>
<td>LMP</td>
<td>... 001.</td>
</tr>
<tr>
<td>00 08 31 12</td>
<td>CC</td>
<td>Roger. I copy LMP 8001. Say the next one.</td>
</tr>
<tr>
<td>00 08 31 16</td>
<td>LMP</td>
<td>CDR is 3102.</td>
</tr>
<tr>
<td>00 08 31 22</td>
<td>CC</td>
<td>Roger. And the CEP?</td>
</tr>
<tr>
<td>00 08 31 24</td>
<td>LMP</td>
<td>We'll have to do ... is all packed up.</td>
</tr>
<tr>
<td>00 08 31 32</td>
<td>CC</td>
<td>Roger. Copy. No reading for the CEP. Thank you. And we've only got about 20 seconds here before we leave. On this surge tank coming up, we say if you would bring the KEPRESS pack on the line and give us a reading on that, it might help us troubleshoot that.</td>
</tr>
<tr>
<td>00 08 32 01</td>
<td>CC</td>
<td>And we're going to lose you here, Apollo 9, at the end of the pass. The next pass is scheduled over Hawaii at 05, which is right at the beginning of your rest period.</td>
</tr>
</tbody>
</table>

END OF TAPE
Apollo 7, Houston. About 1 minute to LOS. Looks like the last time we'll be talking to you this evening.

Roger. That's Apollo 9.

Sorry about that.

That's all right. New guys are that way.

Okay. And --

Roger. And, Houston, we are purging. Is that what you want?

That's affirmative.

We're presently in the process of purging O₂ fuel cells.

Affirmative.

And is your H₂ tank 1 fan on at this time?

We'll bring it on now. We noticed it's 200.

Okay.
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
Good morning, Apollo 9, Houston.

Good morning, Houston. This is Apollo 9.

Roger. Loud and clear. Looks like the night was in good shape. We didn't notice any anomalies.

Very good. I guess we have to wake up now, right?

Yes. It's about that time.

9, Houston. We've got about 2 minutes left here of Mercury, and then we'll pick you up at Antigua at 02. If you feel like talking, I've got a couple of comments for you.

Okay. You say we'll be at Antigua at 02? Did you have anything you wanted to tell us, Ron?

No. I was just going to remind you in your powerup there in the cryo stratification, when you cycle your fans just to note the pressures on them.

Okay. You want us to break the fans out one at a time, is that right?

That's affirmative. And to note the pressures as you bring them up.

Roger.
Apollo 9, Houston through Antigua.

Roger. Houston, Apollo 9.

Roger. I read you loud and clear. I've got a bunch of updates if you're ready to copy some of them. I've got a flight plan, consumables, and a block data.

Roger. Stand by.

Houston, Apollo 9. Go over the flight plan.

Roger. Time: 24:44, page 3 dash 15, delete MCC 00/NO-00 for 33 dash 1.

Roger. 24:44, 315, delete MCC 00/NO-00 for 33 dash 1.

Affirmative. At time 23 plus 34, page 3 dash 14, add MCC 00/NO-00 for 33 dash 1.

Roger. 23:34, page 314, add the MCC 00/NO-00 for 33 dash 1.

Affirmative. And that's the flight plan update.

Roger. What's your next?

Roger. Your consumables.

Okay. Go ahead with the consumables.

GET is 018 8130 6440 8840 8636 564 4331 36 39, now. Houston over.

Roger. Copy 018 8130 6440 8840 8636 564 4331 36 39.

Apollo 9, Houston. Readback correct.

Roger. And ready for your block data.

Roger. Area is 0151 Bravo, plus 267, minus 0670 021 529 3671 0161 Bravo, plus 324, minus 0670 023 2832 3670 0171 Bravo, plus 335, minus 0670 025 0225 3668 0181 Bravo, plus 318, minus 0663 026 3758 3527.
00 19 09 40 CC Apollo 9, Houston through Vanguard. It's a real low elevation here. I'll pass the rest of block data at 12, over Canary.

00 19 09 52 CMP Lost you at 0181 B ...

00 19 12 35 CC Apollo 9, Houston through Canaries.

00 19 12 43 CMP On the 018 dash 1 Bravo block data, I got down through the TIG and then lost you - if you want to go from there.

00 19 12 54 CC Roger. The TIG is 026 3758, the DELTA-Vc is 3627, area 0191 Bravo, plus 258, minus 0692 028 11 50 3627 020 4 Alfa, plus 332, minus 1655 031 07 17 3620, and I have some trim angles if you want them.

00 19 14 09 CMP Roger. Stand by. Go ahead with the trim angles.

00 19 14 18 CC Roger. Area 15: pitch minus 134, yaw plus 135, the next four - the next four areas: pitch minus 080, yaw plus 130. For area 20: pitch minus 090, yaw minus 071.

00 19 15 07 CMP Roger. Copy that. Drop one bit on the 017 dash 1 Bravo TIG, the last digit.

00 19 15 17 CC Roger. 25 seconds.

00 19 15 24 CMP Okay. You ready for the readback?

00 19 15 26 CC Affirmative. Go.

00 19 16 28 CMP Okay. 015 dash 1 Bravo, plus 267, minus 0670 021 5249 3571 0161 Bravo, plus 324, minus 0670 023 2803 3570 0171 Bravo, plus 335, minus 0670 025 0225 3668 018 1 Bravo, plus 318, minus 0663 026 3758 3627 019 1 Bravo, plus 258, minus 0692 026 1150 3627 020 1 Alfa, plus 332, minus 1655 031 0717 3620. And for the trim angles area of 15: pitch minus 134, yaw plus 135. Area 16 through 19: pitch minus 080, yaw plus 130. For area 20: pitch minus 090, yaw minus 071.
Apollo 9, Houston. Your readback is correct. I got about 2 minutes left here; we're missing a little data from the powerdown last night.

Roger. What would you like? We got that.

Say again, Houston.

Okay. What we need is your command module RCS injector temperatures and your pyro A and B batteries and BATT C voltage. Before you give that, though, we'd like to configure your H2 tanks here.

Roger. How would you like them?

Okay. H2 tank 2 heater in AUTO, H2 tank 1 heater OFF, and both fans OFF.

Roger. H2 tank 1 fan OFF, tank 2 fan to AUTO, H2 fans both OFF.

Negative. That's H2 tank 2 heater in AUTO, both fans OFF, and tank 1 heater OFF.

Roger. I just read it backwards to you. H2 heater number 2 in AUTO and number 1 OFF and the fans are both OFF.

Roger.

And --

Apollo 9, Houston. S-band up.

I have the injector temperature if you want it.

Roger. Go.

MADRID (REV 13)

Apollo 9, Houston through Madrid. S-band.

Apollo 9, Houston through Madrid. S-band volume up.
00 19 20 11 CMP Roger. Houston, 9. Looks like we have a good lock now. Did you get the battery readings?

00 19 20 16 CC Negative.

00 19 20 18 LMP Okay. EATT C was 37, gyro A was 37, gyro B was 37, and that was on the powerdown last night.

00 19 20 27 CC Roger. And I didn't get your injector temp, command module temp either.

00 19 20 31 LMP Okay. The injector temps - I'll give you system test meter readout.

00 19 20 36 CC Affirmative.

00 19 20 38 LMP All of them were FULL SCALE HIGH except C, and that was reading 5 volts.

00 19 20 44 CC Roger. Six Charlie with 5 volts.

00 19 20 46 LMP That's correct.

00 19 20 48 CC Okay. Next thing is, on your cryo surge tank pressure, you noticed it took a long time to come up and then all of a sudden it came on up. Did you jiggle any valves or anything?

00 19 21 00 LMP Yes ...

(CARNARVON (REV 13))

00 19 50 43 CC Apollo 9, Houston through Carnarvon.

00 19 50 47 CDR Roger. Houston, Apollo 9. Stand by one.

00 19 51 03 CDR Houston, 9. Go.

00 19 51 06 CC Roger. We listened to your OJT during P52 last night but didn't copy any gyro torquing angles. We could use those if you would copy them down.

00 19 51 18 CDR Very well. Stand by.

00 19 51 37 CDR Okay. Houston, 9. Are you ready to copy?

00 19 51 40 CC 9, go - Or Houston, go.

00 19 51 43 CDR Roger. GST of 08 24 30, plus 00100, plus 060002, minus 00108.
00 19 52 02  CC  Houston.  Copy.
00 19 52 06  CDR  And I'll give you a rundown on the $H_2$ and $O_2$ cryo pressures when we ran the fans if you've got a pencil.
00 19 52 16  CC  Houston.  Go.
00 19 52 19  CDR  Okay.  $H_2$ 1: when we turned the fan off, it was 228 for the pressure, and right now it's about 228.
00 19 52 31  CC  Roger.
00 19 52 33  CDR  $H_2$ 2: when we turned the fan on, it was 242. After 3 minutes of fans it was 242.
00 19 52 44  CC  Roger.  Sounds good.
00 19 52 47  CDR  $O_2$ 1: when we started out with the $H_2$, it was 816 by the time we got to the $O_2$, and it was 890 when the fans were turned on; it was 880 when the fans were turned off.
00 19 53 03  CC  Roger.  Copy.  890 to 880.
00 19 53 07  CDR  That's correct.  And $O_2$ 2: when the fans were turned on it was 880, and when they were turned off it was 870.
00 19 53 17  CC  Roger.  880 to 870.  And S-band volume up at 56.
00 19 53 23  CDR  Roger.  It's up now.
00 19 53 33  CDR  And, Houston, 9.  We're down through the CMC subtests and getting ready for a PS1.  Do you want those CMC subtests numbers?  They're on the DSKY.
00 19 53 48  CC  Roger.  We have them.

HONEYSUCKLE (REV 13)

00 19 57 48  CC  Apollo 9, Houston through Honeysuckle.
00 19 57 55  CDR  Roger.  Houston, Apollo 9.  Loud and clear.
00 19 57 58  CC  Roger.  Same.  We never did get what you did on those cryo valves.  I tried to get that surge tank up.
(GCA NET 1)

00 19 58 06 LMP All I did was move the surge tank knob back and forth a little bit on the console, here, and then I went to bed. And I think that may have done it.

00 19 58 18 CC Roger. That did it.

00 19 58 20 LMP And did it come up pretty fast after that, Ron?

00 19 58 22 CC Affirmative.

00 19 58 24 LMP Okay. Well, we never did get our FLESS tank filled, so we're going to be filling that here along the - along the way today. It only has about 200 or 300 psi in it.

00 19 58 34 CC Roger. We understand.

00 19 58 53 EC Houston, Apollo 9.

00 19 58 55 CC Houston. Go.

00 19 58 56 LMP Roger. We're still charging battery B. What's the status of that? Do you want us to continue or stop or what have you?

00 19 59 03 CC Affirmative. Go ahead and continue on it. We estimate it will probably be up to charge at about 22 hours or just before SPS number 2 burns, and we'll tell you at that time to turn it off.

00 19 59 16 LMP Okay. Very good.

00 20 02 28 CC Apollo 9, Houston. Thirty seconds L03; Mercury at 08.

00 20 02 32 CDR Roger.

MERCURY (FLY 13)

00 20 12 09 CC Apollo 9, Houston through Mercury. Standing by.

00 20 12 12 CDR Roger, Houston.

00 20 12 14 CC Roger.

00 20 13 44 CC Apollo 9, Houston. We indicate you're right close to gimbal lock.

00 20 13 51 CDR That's affirmative.

END OF TAPE
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 20 36 17</td>
<td>CC</td>
<td>Apollo 9, Houston through Antigua.</td>
</tr>
<tr>
<td>00 20 36 40</td>
<td>CC</td>
<td>Apollo 9, this is Houston through Antigua.</td>
</tr>
<tr>
<td>00 20 36 43</td>
<td>CMP</td>
<td>Roger. Houston, Apollo 9. How do you read?</td>
</tr>
<tr>
<td>00 20 36 45</td>
<td>CC</td>
<td>I read you loud and clear. Good morning.</td>
</tr>
<tr>
<td>00 20 36 50</td>
<td>CMP</td>
<td>Good morning. We were wondering whether maybe you want to give us the updates first, or whether you want an E-memory dump first?</td>
</tr>
<tr>
<td>00 20 37 03</td>
<td>CC</td>
<td>We do not need an E-memory dump.</td>
</tr>
<tr>
<td>00 20 37 07</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>00 20 37 13</td>
<td>CMP</td>
<td>Okay. We're ready to accept your update, then, any time, Houston.</td>
</tr>
<tr>
<td>00 20 37 19</td>
<td>CC</td>
<td>Roger. Stand by one on that. I have an SPS-2 PAD here for you any time you're ready to copy, and we'll have the loads ready for you in a minute.</td>
</tr>
<tr>
<td>00 20 37 33</td>
<td>LMP</td>
<td>Stand by. He's getting it.</td>
</tr>
<tr>
<td>00 20 37 36</td>
<td>CMP</td>
<td>Okay. Go ahead. Ready to copy.</td>
</tr>
<tr>
<td>00 20 37 39</td>
<td>CC</td>
<td>Roger. SPS-2: 022 12 03 00, plus 00993, minus 08 446, plus 00 176 08 506 08 457 1512, and stand by one.</td>
</tr>
<tr>
<td>00 20 38 37</td>
<td>CC</td>
<td>Apollo 9, we're ready to uplink at this time, and then I'll finish the PAD while they're doing that.</td>
</tr>
<tr>
<td>00 20 38 43</td>
<td>CMP</td>
<td>The computer is yours.</td>
</tr>
<tr>
<td>00 20 38 45</td>
<td>CC</td>
<td>Okay. We have the computer. And starting again, I finished up on the burn time which was: 15 12 58 0514, plus 20 21 00, minus 0 20 21 20 640 13 200, plus 01 23, plus 05 6516 45. End of update.</td>
</tr>
<tr>
<td>00 20 39 38</td>
<td>CMP</td>
<td>Okay, Houston ...</td>
</tr>
<tr>
<td>00 20 40 00</td>
<td>CMP</td>
<td>... 08506 08507 ... 3 58504, plus 100, minus 020 21 2084 0 13200, plus 1 - rather - plus 0013, plus 0540 0 ... I beg your pardon - 1645.</td>
</tr>
</tbody>
</table>
Apollo 9 ... The COMM on that was extremely bad. I only got about three lines of the whole blooming smear. Let's stand by one. I think we are going to hand off here, and maybe we can try it again.

Vanguard (RXV 14)

00 20 40 40 CC Apollo 9, this is Houston. Do you read?

00 20 41 16 SC Houston, Apollo 9.

00 20 41 29 SC Houston, Apollo 9.

00 20 41 44 SC Apollo 9, this is Houston. Do you read?

00 20 41 49 SC Roger. This is Apollo 9 here, Houston.

00 20 42 02 SC Houston, this is Apollo 9.

00 20 42 23 SC Houston, Apollo 9.

00 20 42 30 CC Okay. Apollo 9, this is Houston. If you read me, I cannot get you. I can hear that you are transmitting; you are way, way down. The site is reporting no VHF downlink. You might check that, but I don't understand why our S-band isn't any better either.

00 20 42 53 SC Okay. Can you read now?

00 20 42 57 CC Apollo 9, this is Houston. I can barely read you. I just barely copied it.

00 20 43 05 SC Roger ... S-band ...

00 20 44 03 CDR Houston, Apollo 9. How now?

00 20 44 06 CC Apollo 9, you are very, very weak. I can't get your readbacks, but I'd like to give you the NAV check again. The NAV check I gave you was wrong. We're starting off good today, and I'd like to - If you can copy, I'd like to read you the NAV check again. It should be: minus 2801, minus 16997 1228.

00 20 44 55 CDR Okay. How can you read me?

00 20 44 58 CC I can just hear you transmitting, and that's about all.
(Goss Net 1)

Canary (Rev 14)

00 20 46 21  CMP  Houston, Apollo 9. How do you read now?
00 20 46 26  CC  Hello. Apollo 9, Houston. Do you read now?
00 20 46 37  CMP  Houston, 9. Read you five-by.
00 20 46 39  CC  Great! We've got you through Canaries now. Evidently, we couldn't get Vanguard and Antigua back through Goddard. Did you copy my correction on the NAV check?
00 20 46 48  CMP  Roger. If you read, I got a minus 2891, minus 16997 122.8.
00 20 46 58  CC  Roger. That ought to check a lot better, and I'm reading you five-square now. We've got good COMM through Canaries here for about the next 5 minutes.
00 20 47 08  CMP  Roger. Did you read the readback on the SPS-2 PAD?
00 20 47 15  CC  Okay. Go ahead.
00 20 47 17  CMP  Okay. 02212 03 00, plus 00993, minus 08446, plus 00176 08506 08547 1512 58502, plus 100, minus 020, 2120840 13200 - And you've already got the NAV check.
00 20 47 58  CC  Roger. I confirm the update. One small correction. The last number in the CSM weight is 4, vice 2 as you read, but that really doesn't matter.
00 20 48 09  CMP  Yes. I guess I wrote it right and read it wrong.
00 20 48 13  CC  Okay.
00 20 48 14  CMP  58504.
00 20 48 16  CC  That's affirmative.
00 20 48 27  CC  And, Apollo 9, the computer is yours. We have given you a target load, a state vector, and a Venk 66.
00 20 48 41  CMP  Roger. Copy.
00 20 49 19  CC  Apollo 9, Houston.
00 20 49 21  CMP  Go.
Roger, Houston. Go.
Okay. We're got about 3 minutes here. We would like to update that PIPA bias if we can have the computer again.
Okay. The computer is yours, and while you're doing that, I'd like to know what you would like us to do with battery B. We are still charging it, and it's now down to about 0.4.
Roger. Last word I had was we wanted to run the battery charge; it'll probably run up to almost the time of SFS-2.
Okay. Thank you.
And we're indicating about 0.43 or so, and we'd like to let it run awhile and cut it off on our indication.
Okay.
And, Apollo 9, we'll be handing over to Madrid, so have your S-band volume up.
Apollo 9, Houston. The computer is yours. The PIPA bias is in.
Roger. Thank you.

MADRID (REV 14)

And, Apollo 9, this is Houston. We're about 30 seconds from LOG Madrid, and we'll see you over Carnarvon at 21.
Roger. Carnarvon at 21.

CARNARVON (REV 14)

Apollo 9, Houston through Carnarvon.
Hello, Houston. Apollo 9.
I read you five-square.
00 21 21 36  CDR  Roger.

00 21 21 47  CDR  Just had an interesting sidelight here, Houston. Whenever we give the command module/EMU combination a pulse of DIRECT ACCELERATION COMMAND to attitude control system, we get lot of coupling from pitch to yaw and back to pitch. I suspect this stoker test may be fairly exciting.

00 21 22 08  CC  Roger. I guess it must be a lot more noticeable than on the simulator, then.

00 21 22 16  CDR  Sure is!

00 21 22 18  CC  (Laughter) Stand by for a ride.

00 21 22 33  CDR  And, Houston, another little interesting sidelight; when we woke up this morning and got the RMAGS ready - and after drifting all night - Our highest drift rate was approximately 1/10 of a degree per second.

00 21 22 49  CC  Roger, Apollo 9. Copy.

00 21 24 47  CWP  Houston, Apollo 9.

00 21 24 49  CC  Go, Apollo 9.

00 21 24 51  CWP  Do you still want us to cycle our H2 and O2 tanks prior to the burn, or do you want to just leave them alone?

00 21 25 03  CC  Apollo 9, Houston. We do not want them cycled prior to the burn. Just let them go as is.

00 21 25 10  CWP  Okay. Very good.

00 21 27 18  CC  Apollo 8, Houston.

00 21 27 22  CDR  Go ahead.

00 21 27 23  CC  Roger. You can terminate the charge on battery B. And for your info, we took 10 AMP-hours out and put seven back in.

00 21 27 34  CDR  Roger.

00 21 27 59  CC  Apollo 9, Houston. Like to make sure you have your S-band volume up. We will be picking up Honeysuckle in about a minute.
<table>
<thead>
<tr>
<th>Time</th>
<th>CDR</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 21 28 10</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>HONEYSUCKLE (REV 14)</strong></td>
</tr>
<tr>
<td>00 21 35 44</td>
<td>CC</td>
<td>And, Apollo 9, this is Houston. We are 1 minute to LOS Honeysuckle. We'll see you over Mercury at 41.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>MERCURY (REV 14)</strong></td>
</tr>
<tr>
<td>00 21 36 36</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>00 21 42 26</td>
<td>CC</td>
<td>Apollo 9, Houston through Mercury.</td>
</tr>
<tr>
<td>00 21 42 33</td>
<td>CDR</td>
<td>Roger. Houston, Apollo 9.</td>
</tr>
<tr>
<td>00 21 42 35</td>
<td>CC</td>
<td>Sterling! You are loud and clear.</td>
</tr>
<tr>
<td>00 21 42 39</td>
<td>CDR</td>
<td>Roger. We're in process of donning our helmets and gloves here for the burn.</td>
</tr>
<tr>
<td>00 21 42 45</td>
<td>CC</td>
<td>Roger. Understand.</td>
</tr>
<tr>
<td>00 21 43 20</td>
<td>CC</td>
<td>And, Apollo 9, this is Houston. I believe you went over the hill at Honeysuckle, there, before I got you, but you are GO for SPS-2.</td>
</tr>
<tr>
<td>00 21 43 24</td>
<td>CMP</td>
<td>Roger. Understand we are GO for SPS-2. Thank you.</td>
</tr>
<tr>
<td>00 21 43 26</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>00 21 47 40</td>
<td>CC</td>
<td>Apollo 9, Houston. One minute LOS Mercury, and we'll see you over Texas at 04.</td>
</tr>
<tr>
<td>00 21 47 47</td>
<td>SC</td>
<td>Roger. Texas at 04.</td>
</tr>
</tbody>
</table>
TEXAS (REV 15)

00 22 04 41 CC Apollo 9, this is Houston through Texas. Standing by for your burn.

00 22 04 45 CMP Roger.

00 22 10 20 CC Apollo 9, Houston.

00 22 10 22 CDR Houston, go.

00 22 10 23 CC Roger. We are showing your scale in five, five.

00 22 10 26 CDR Roger. Understand five, five will shift to five and one when we get ready for PESTROKER.

00 22 10 31 CC Roger. Thank you.

00 22 14 35 CMP Houston, we have your residuals.

00 22 14 37 CC Apollo 9, I've got minus 0001, plus 0007, and plus 00003.

00 22 14 48 CMP Okay. That's pretty good, and the DELTA-V counter was minus 5.0.

00 22 14 52 CC Say it again. Minus 5.0.

00 22 14 56 CMP Minus 5.1.

00 22 14 58 CC Minus 5.1.

00 22 15 09 CC And it looked pretty smooth, Apollo 9.

00 22 15 17 CC And, Apollo 9, Houston. Our first catch shows you 169 by 103.

00 22 15 37 CC And I copy your on-board noun at 44, Apollo 9.

VANGUARD (REV 15)

00 22 17 21 CC Apollo 9, Houston through the Vanguard. How do you read?

00 22 17 26 CDR Loud and clear, Houston. How do you read us?
00 22 17 28 CC That's about a thousand percent improvement over the last pass. Reading you loud and clear. Our earthband track now shows you 192 by 107. Looks like we are about to agree with you.

00 22 17 39 CDR Roger. How's our PIPA bias?

00 22 17 45 CC Stand by.

00 22 18 19 CDR Houston, Apollo 9.

00 22 18 21 CC Go, Apollo 9.

00 22 18 24 CDR Roger. ESTROKER looks pretty smooth. We had a 40 percent ... about 30 percent of 1 degree, and the MAX rate in pitch was about a tenth of a degree, and there didn't appear to be any coupling in the yaw. It all damped out probably about 5 seconds after the ESTROKER stopped.

00 22 18 45 CC Roger, Apollo 9. Copied. Sounds great.

00 22 18 53 CDR Okay. Houston, Apollo 9 here. SPS PU sensor light came on during the burn because of the large unbalance we had. However, it immediately jumped back down, and we are presently reading 69.25 percent oxidizer and 69.8 percent fuel, and the unbalance is reading decrease about 30 pounds.

00 22 19 22 CC Roger, Apollo 9. Copied. Sounds like things are shaping up.

00 22 19 29 CDR We still don't have an indicated helium pressure, though.

00 22 19 34 CC Well, maybe if you kick that transducer again, you'll get that back.

00 22 19 39 CDR If you'll tell us where to kick, we'll try it.

00 22 19 43 CC Roger. In work.

00 22 19 49 CC And at your convenience I have your gimbal angles for SPS-3 using your SPS-2 REFORMAT.

00 22 19 58 CDR Roger. Stand by.

00 22 20 01 CDR Okay. Ready to copy.

00 22 20 05 CC Roger. Reading: roll 024, pitch 001, yaw 353.

00 22 20 21 CDR 024, 001, 3 ...
00 22 20 25  CC  Roger. 353 on the jaw, and I'd like to make sure your B-band volume is up. We'll be handing over to Honeysuckle in about 3 minutes - 3 or 4 minutes. I mean Madrid - Sorry about that.

00 22 23 09  CC  Apollo 9, Houston.

00 22 23 10  CDR  Go ahead, Houston.

00 22 23 12  CC  Roger. We're showing PIPA bias as minus 0.02 feet-per-second squared.

00 22 23 21  CDR  Roger. It looks like we counted up about - almost a foot per second there in that 30 seconds we were waiting for the burn to start.

00 22 23 31  CC  Roger. Copy. And, Apollo 9, Houston. That looks like it's within tolerance, so we accept that.

00 22 23 46  IMP  Roger, Houston. And be advised the count in R-3 was positive. Also there prior to the burn, not negative.

00 22 23 58  CC  Roger. Copy.

00 22 24 20  CC  And, Apollo 9, this is Houston. Fido is real happy with that burn; says it's completely nominal. Looks like he won't even have to retarget for SPS-3. You do good work.

00 22 24 35  CDR  Roger. And I assume you'll give us a GO for the structural demonstration before we get there. Right?

00 22 24 42  CC  That's affirmative.

00 22 24 44  CDR  Okay.

00 22 25 04  CHP  Houston, Apollo 9.

00 22 25 06  CC  Go.

00 22 25 07  CHP  Roger. For your information on the clock, the burn shut off about 8/10 of a second early.

00 22 25 16  CC  Roger. Copy.
00 22 26 39 LMP Hey, Smokey.
00 22 26 41 CC Roger. Smokey here.
00 22 26 44 LMP I'll call you again in a minute.
00 22 26 47 CC Say again.
00 22 26 56 LMP Hey, Smokey.
00 22 26 57 CC Go.
00 22 26 58 LMP Have you ever been attacked by a band of wild elephants?
00 22 27 02 CC Negative.
00 22 27 04 LMP You ought to see what it looks like in here with these six big black hoses.
00 22 27 09 CC (Laughter) Roger. Copy.
00 22 27 16 LMP Did you ever dream about octopuses?
00 22 27 20 CC Speaking of dreaming, how did the night go?
00 22 27 25 LMP I guess we did okay for a first cut.
00 22 27 28 CC Okay. Sounds real good. I'm going to lose you here at Madrid in about 30 seconds, and we'll see you over Carnarvon at 54.
00 22 27 35 LMP Stu, one thing we were having a problem with was a lot of radio chatter coming up from the ground.
00 22 27 40 CC Okay. We'll see if we can stop that tonight.
00 22 27 48 CDR What did you do ... pass.

CARNARVON (REV 15)

00 22 54 17 CC Apollo 9, this is Houston through Carnarvon.
00 22 54 21 LMP Go ahead, Houston.
00 22 54 23 CC Roger. You're making it five-square. Standing by.
00 22 54 27 LMP Okay. We're chlorinating our water.
Very good. You are chlorinating your water.

That's a little behind schedule on that, but that's what we're doing.

And, Apollo 9, Houston. Remind you on your S-band volume, we'll be going over to Honeysuckle in about 2 minutes.

Roger.

Apollo 9, Houston. I've got a question for you when you've got time, at your convenience.

Apollo 9, Houston. Do you read?

Apollo 9, Houston. How do you read through Honeysuckle?

Houston, say again.

Roger. I've got a question for you when you get time.

Yes. Go ahead.

Okay. Just to ease our mind here to make sure we're working on the same procedures, we're curious about loading the DAP. We'd like to verify that you are doing that prior to the P30, P40 program.

The last time we did it after P30, but prior to P40.

Okay. We would like to have you load the DAP prior to both P30, and P40 prior to your P52.

Okay. We'll do that.

Okay. Very good.

I guess we also have a question on whether you want us to load the PITCH TRIM and YAW TRIM you send us up next time, which looks like it will be somewhat different from what the DAP ended up with on the SP2-2.
Tape 15/6
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(COSS NET 1)

00 23 06 58 CC Okay. Would you say the first part of your question again, Dave?

00 23 07 04 CMP Roger. We've looked at the nominal SPS-3 PITCH TRIM and YAW TRIM for the gimbals, and they look somewhat different from what we ended up with after SPS-2. I guess the question is, do you want us to load your numbers or our numbers?

00 23 07 19 CC Okay. Copy. We'll give you that info, and I have the PAD.

00 23 07 25 CMP Okay. Stand by.

00 23 07 40 LMP Houston, do you have a PAD at this time?

00 23 07 43 CC That's negative, Apollo 9.

00 23 07 46 LMP Okay.

00 23 10 34 CC And, Apollo 9, this is Houston. We're about a minute to LOS at Honeysuckle, and we'll see you over Mercury about 15.

00 23 10 43 LMP Roger.

MERCURY (REV 15)

00 23 15 55 CC Apollo 9, this is Houston through the Mercury. Standing by.

00 23 16 00 CMP Roger. Go ahead.

00 23 16 02 CC Roger. Just checking in. You are coming in five-square. Sounds like the Mercury is working good.

00 23 16 08 CMP That's a very pleasant surprise.

00 23 16 11 CC Roger.

00 23 16 13 CMP How's the weather in Houston, Smokey?
Would you believe that there was ice on the windshield this morning?

No, I wouldn't.

Well, I speak with a straight tongue.

Is the place washed away yet?

No, we are keeping all the water out, and everything's pretty good. It's just a little chilly.

Very good.

I wish we could say the same.

What - Does that mean you are running hot, or you're not dry?

We're a tad damp on occasion.

Ah-so. Copy.

There's nothing wrong. Those are human errors.

Roger. Smokey understands.

You've never made one; you've just heard about them. Is that right?

That's a negative.

Sounds like you all are too relaxed today. We'll have to put you to work tomorrow. You better save it up.

This is bad enough today just trying to figure out how we eat and sleep.

Houston, Apollo 9.

Go, Apollo 9.

I got some data here on our little interruptions last night. Seems like we were going over some station that was transmitting VHF-D from a tower clearing people to land, and it was daylight when we went over, and I have got some times. I doubt if it will do any good, but you can have them anyway.
00 23 20 06 CC Okay. Go ahead.
00 23 20 08 CMP We picked up some at 10:18, 10 hours and 18 minutes. Again at 11:57; again 16:35; again at 10:12. And the first couple sounded somewhat like Chinese.
00 23 20 31 CC Roger. Understand the first couple was a Navy tower.
00 23 20 35 CMP Something like that. I'm not an expert in that particular branch, but it was strange.
00 23 20 40 CDR I'll give you a clue. They've got a runway that's 112, and they have a taxiway 112. They fly a whole bunch of different kinds of airplanes - Mohawks, and C-47 and Ol's.
00 23 20 54 CMP And if you really wanted, you could call Green Hornet 35 or Black Hawk 15.
00 23 21 03 CC Roger. Copy all that. You know I thought you were jesting awhile ago when you said about the transmissions interrupting you.
00 23 21 12 CMP Negative. Every hour and a half. We had about a two 6 or 7 minute passes. Chris ought to incorporate these guys in the network.
00 23 21 24 LMP Actually, it was one of the better tower operators I've heard. The guy really had a lot of traffic, and he was doing pretty good.
00 23 21 56 CC Okay - Okay, Apollo 9. This is Houston. We'll do a little work on this to see what's going on. Yes, I didn't realize you had this, and it is on the DSE. We'll take a look at it.
00 23 22 12 CDR Okay. Good.
00 23 22 25 CC I guess it's all right just as long as you don't have to get clearance through the - through that tower. And I am going to lose you in Mercury in about a minute and we'll see you over Guaymas around 3½.
00 23 22 37 CDR Okay.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

GUAYMAS (REV 15)

00 23 35 14 CC Roger. I haven't heard anything.
00 23 35 23 LMP Okay. Stand by. Houston, how do you read Apollo 9?
00 23 35 27 CC Apollo 9, this is Houston. Reading you loud and clear.
00 23 35 37 CC Apollo 9, this is Houston. I read you loud and clear.
00 23 35 41 LMP ... you copy fast.
00 23 35 51 LMP Houston, Apollo 9.
00 23 35 53 CC Apollo 9, I'm reading you loud and clear. How are you?
00 23 35 56 LMP Same. Ready to copy.
00 23 35 58 CC Roger. You'll have to stand by here; don't have it yet. Let me give you an estimate of when it's going to come out of the trench.
00 23 36 05 LMP Okay.
00 23 36 35 CC Okay. Apollo 9, Houston. We've got the PAD all ready with the exception of the star data, and we ought to have it for you in another 4 or 5 minutes. We've got you now on a nice long stateside pass here.

MILA (REV 16)

00 23 43 20 CC Apollo 9, Houston.
00 23 43 23 CMR Go ahead, Houston.
00 23 43 24 CC Roger. We would like to give you a state vector and a target load, if you will go POO in ACCEPT.
00 23 43 30 CMR Roger. It's yours.
00 23 43 33 CC Understand it is ours.
00 23 43 35 CMR That's affirmative.
Apollo 9, Houston. I have your SPS-3 PAD.
Roger, Houston. Ready to copy.
Roger, Heading SPS-3: 025 17 38 00, plus 00 151, minus 25 707, minus 00 00 2 25 707 25 640 4 419 51 207, plus 118, minus 017 21 12 010 21 600, minus 21 45, plus 16 667 16 10. End of update.
Okay. You ready for the readback?
Go.
Roger. 05 17 38 00, plus 00 151, minus 5 707, minus 00 25 707 5 60 4419 51 207, plus 118, minus 017 21 120 10 21600, minus 21 45, plus 16867 1610.
Roger. I think you got it all there, Rusty, but I want to confirm a couple of them. Seemed like you were cutting out on the two on the time. It's 025 DELTA-V_y is a minus 25707, and DELTA-V_z minus 00 002, and DELTA-V_c 25 640.
Roger. We've got that.
Okay. Second.
And, Apollo 9, the computer is yours. You have your target load and the state vector in both slots.

VANGUARD (REV 16)
Roger. Did you happen to notice the PITCH and YAW TRIM that we have in the DAP at this time, after the last burn?
Roger. It looked like we were running pretty close.
Apollo 9, Houston.
Go ahead.
Roger. Just for your info, we did take your values and use them. That's why they checked so well.
Okay.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 23 48 53</td>
<td>CC</td>
<td>We're shaping up.</td>
</tr>
<tr>
<td>00 23 48 56</td>
<td>COP</td>
<td>DAP wins again.</td>
</tr>
<tr>
<td>00 23 49 38</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>00 23 49 42</td>
<td>CDR</td>
<td>Go ahead, Houston.</td>
</tr>
<tr>
<td>00 23 49 44</td>
<td>CC</td>
<td>Roger. The data from the SPS-2 burn on the PISTROKES looks real nominal with rigid body results. Max rate and pitch was about 2 seconds after initiation and peaked out about a minus 0.15. The yaw was real low, and everything was essentially nominal, and you are GO for a full amplitude on SPS-3.</td>
</tr>
<tr>
<td>00 23 50 17</td>
<td>CDR</td>
<td>Okay. And we'll give you a full structural demonstration.</td>
</tr>
<tr>
<td>00 23 50 21</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>00 23 50 23</td>
<td>CDR</td>
<td>It's sort of interesting. The RCS quads, when they fire, even in the middle of impulse, and particularly when we are moving around in ADAPT, you can feel the whole thing shake and vibrate. It really feels just like o ... When the SPS burns, it's pretty solid.</td>
</tr>
<tr>
<td>00 23 50 42</td>
<td>CC</td>
<td>Roger. Copying.</td>
</tr>
<tr>
<td>00 23 51 09</td>
<td>CDR</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>00 23 51 10</td>
<td>CC</td>
<td>Go, Apollo 9.</td>
</tr>
<tr>
<td>00 23 51 15</td>
<td>CC</td>
<td>Apollo 9, Houston here. Go ahead.</td>
</tr>
<tr>
<td>00 23 52 07</td>
<td>CC</td>
<td>Apollo 9, this is Houston. I didn't copy your last transmission. If you will just hang loose for just a couple of minutes we will be over the Canaries, and I'll be able to read you then.</td>
</tr>
<tr>
<td>00 23 52 18</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
</tbody>
</table>

**CANARY (REV 16)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 23 54 45</td>
<td>CC</td>
<td>Apollo 9, Houston through Canaries. How do you read?</td>
</tr>
<tr>
<td>00 23 54 58</td>
<td>CDR</td>
<td>Read you five-by.</td>
</tr>
</tbody>
</table>
00 23 55 00  CC  Roger. Apollo 9, you have a GO for 33 dash 1.
00 23 55 04  CDR  Roger. Understand GO for 33 dash 1.
00 23 55 08  CC  And I'm reading you five-square, and I missed your last transmission when we were mixed up on the Vanguard there.
00 23 55 16  CDR  Roger. I was just commenting that the machinery here is very interesting because with the ECS quad, you can feel the whole structure bend and vibrate, just one or two propulsions; yet with the BPS, it seems pretty solid. You can hardly feel any bending at all.
00 23 55 34  CC  Roger. Copy. Thank you.
00 23 55 36  CDR  Houston, Apollo 9.
00 23 55 38  CC  Go, Apollo 9.
00 23 55 40  CDR  What the time for this burn? We have 25:17:38:20 in our computer, and I just have 25:17:38 here.
00 23 55 56  CC  Apollo 9, this is Houston. Go with the time in the computer.
00 23 56 02  CDR  Okay.
00 23 58 07  CC  Apollo 9, Houston.
00 23 58 08  LMP  Go ahead, Houston.
00 23 58 09  CC  Roger. We would like to have you confirm this onboard. It appears here that the evaporator appears to be drying out. If this is true, we would recommend just shutting it down, not to service it at this time.
00 23 58 22  LMP  Okay. We can confirm that onboard, and I'll go ahead and shut it down.
00 23 58 28  CC  Roger. Understand.
01 00 00 22  CC  Apollo 9, Houston.
01 00 00 25  LMP  Go ahead.
01 00 00 26  CC  We're about a minute and a half EOS Canaries, and Teanaway is down this pass. We'll see you over Carnarvon at 30.
(GOSS NET 1)                                        Tape 16/5
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01 00 00 36   LMP   Roger.  Carnarvon at 30.
01 00 00 55   LMP   Houston, do you still read Apollo 9?  If you do,
                   we would like to advise you that we did get the
                   secondary water flow control OFF yesterday.
01 00 01 05   CC    Roger.  Copy that.  And I should be able to copy
                   you for about another 45 seconds or so.
01 00 01 12   LMP   Okay.

CARNARVON (KCV 16)                                  

01 00 28 30   CC    Apollo 9, Houston through Carnarvon.  Standing by.
01 00 28 34   LMP   Roger.
01 00 30 12   CDR   Houston, are you ready for torquing angle?
01 00 30 15   CC    Go ahead.
01 00 30 18   CDR   Roger.  Plus 232, minus 473, minus 841.  24:28:00.
01 00 31 48   CC    And, Apollo 9, Houston.  We copy that.  The time
                   24:28:00.
01 00 31 56   CDR   Roger.
01 00 36 28   CC    And, Apollo 9, Houston.  Like to have you bring
                   up your S-band volume.  We'll be going over the
                   Honeysuckle in about a minute and a half.
01 00 36 37   LMP   Roger.  S-band is up.
01 00 36 40   CC    Copy.

HONEYSUCKLE (REV 16)                                

01 00 41 35   CC    Apollo 9, Houston.
01 00 41 37   LMP   Go ahead, Houston.
01 00 41 38   CC    Roger.  You are 00 for SPS-3.
01 00 41 41   LMP   Roger.  Understand.  GO for SPS-3.
01 00 45 45   CC    And, Apollo 9, this is Houston.  We are going to
                   lose you here at Honeysuckle in about 30 seconds.
The COM through the Huntsville is reported to be a little bad here. If we don't make contact there, we'll see you at the Redstone at 02.

Huntsville (REV 16)

01 00 47 14 CT Huntsville. Valid two-way.
01 00 47 17 CC Say again, Apollo 9.
01 00 47 58 CC And, Apollo 9, this is Houston. We'll have you through the Huntsville here for about 5 minutes. If the noise gets to blasting you, try to let us know. We'll just turn it off.
01 00 48 14 CDR Roger, Houston. How do you read?
01 00 48 17 CC You're down in the mud a little bit; I can copy.
01 00 51 40 CC And, Apollo 9, Houston. Coming off the Huntsville in about 1 minute. We'll see you over Redstone about 02.

END OF TAPE
And, Apollo 9, this is Houston through the Redstone. Standing by for your burn.

Roger.

Houston, Apollo 9.

Roger, Apollo 9. I copy the residuals at plus 26, minus 21, and minus 25.

Roger. That's pretty close, and we have a minus 6.6 on the DELTA-V counter. And the burn was nominal, stroker was mild.

Roger. Copy minus 6.6 on the DELTA-V, and we were monitoring here - It looked real smooth, and everything looked great.

Here's our orbit, Houston: 274.5 by 109.6.

Roger. Copy that, and it - The burn looks real good here. We will have you the onboard reading, but it's going to be real nominal. And we will have the ground orbit for you shortly.

Dave, did you have to do much flying on that MTVC?

Roger. We had a pretty good transient in roll, but when I switched over I believe because the EMAGS were caging zero, and we were sitting in the edge, the DAP did bend about 5 degrees over. We were ... by the time we got to the switchover, our GIMBAL TRIM was almost two, and we trimmed a little over one in pitch, which gave a little transient at pitch. And we had about a half a degree in trim and yaw, which gave a little transient in yaw, but pretty easy to damp out all of A and move just about like the simulator.

Roger. Thank you.
GOSS 9, 17/2

REBAUDA (REV 17)

01 01 25 00 LMF And, Houston, we've got a couple of other system things we're going to have to tell you about here before you go over the hill.

01 01 25 04 CC Roger. Go ahead. We have got several minutes.

01 01 25 08 LMF Okay. We would like you to take a look at fuel cell 3. At the present time, the fuel cell 3 O2 flow is high. I'm reading 0.78 in it, and the H2 flow at the same time is 0.072, so we may have a leaky fuel cell 2 purge valve or something.

01 01 25 31 CC Roger. Copy.

01 01 25 34 CMP Kind of resembles all over during a burn, and we are presently 500 pounds on the increase side. The light must have come on at least 6 or 7 times. I went to AUXILIARY on it, and the light came on and off there also. I switched back to NORMAL, and we are presently reading 23.1 and 21.1, AUX and fuel, respectively.

01 01 26 02 CC Roger. Copy that. And 23.1 and 21.1.

CANARY (REV 17)

01 01 27 12 CC And, Apollo 9, Houston. I have your gimbal angles for SP8-4 using this REFSMAT.

01 01 27 20 CMP Go ahead.

01 01 27 25 CC Roger. Roll 017, pitch 001, yaw 355.

01 01 27 37 CMP Roger. 017, 001, 355.

01 01 27 42 CC That's affirmative, Apollo 9.

01 01 36 02 CC And, Apollo 9, Houston. We are about a minute from LG3 on Canaries, and we'll see you over Tananarive about 48.

01 01 36 09 LMF Okay. Houston, Apollo 9, here.

01 01 36 16 CMP What's our average, Houston?
Roger. Stand by. We haven't got that out of FIDO yet.

Okay. And also, Houston, you might have some words to say after you look at the data there on the SPSP sensor. Both normal and AUX have a pretty high increase. I'd like to know if you want to go DECREASE on the next burn.

Roger, Apollo 9. We are going to have some work on the FOGS for the SPS-4.

Okay.

And, Apollo 9, Houston. We're losing you here. We'll see you over Tananarive with a preliminary orbit - I hope.

TANANARIVE (REV 17)

Apollo 9, Houston through Tananarive.

Okay. Apollo 9, Houston. I think you are trying to answer me, but you are unreadable. Our orbit is showing you in a 271.8 by 109.5.

Roger. How do you read ...?

You are essentially unreadable, Apollo 9; I can detect you are transmitting.

Apollo 9, Houston. We are going to lose you at Tananarive in about a minute, and we'll see you over Carnarvon at 05.

Roger, Houston. How do you read us now?

I missed that, Apollo 9. Say again.

Are you able to read us now?

I can make you out now - barely. Before, I couldn't read you at all.
Okay. We'll see you at 05 at Carnarvon.

Roger.

Apollo 9, Houston through Carnarvon.

Roger. Houston, Apollo 9.

Roger. You are loud and clear, and we've got you here at Carnarvon for about 10 minutes.

Beautiful. This must be one of those long passes.

Roger. I guess you copied the orbit we're showing you in over Tananarive.

Roger. We did, and I'd like to update you on the malfunction procedure. Stand by just one.

Roger.

Okay. We've gone through malfunction 1-Golf, and we've worked our way through steps 1, 5, and 6, and we're presently standing by to see if the cryo quantity decreases abnormally. And be advised, if you are ready to copy, I've got some data on the purge flow.

Roger. I copied malfunction 1-Golf, your steps, and I'm standing by to copy.

Okay. In step 5 there, when I purged fuel cell 3, the $O_2$ flow increase was much greater than normal. In fact, it went OFF SCALE HIGH, so I don't know how much of an increase I got, but the increase went from 0.65 to OFF SCALE HIGH.

Roger. Copy. From 0.65 to OFF SCALE HIGH on the $O_2$ flow, purged fuel cell 3.

Roger.

Apollo 9, Houston.

Go ahead, Houston.
01 02 08 45  CC  Roger. Just a couple items on the flight plan. In regards to this subject, at about 29:45 there is an O2 purge on the fuel cells shown, and we would like to have you do that over a ground station so we could watch it.

01 02 09 02  CMP  Okay. You want us to purge over a ground station on that 29:45 purge.

01 02 09 07  CC  That is affirmative.

01 02 09 10  CC  And -

01 02 09 13  SC  ...

01 02 09 14  CC  Go, Apollo 9.

01 02 09 16  CMP  Roger. I beg your pardon. Would you like that over Hawaii?

01 02 09 20  CC  Hawaii will be fine.

01 02 09 23  CMP  Okay.

01 02 09 25  CC  And one other item on the flight plan.

01 02 09 28  CMP  Why don't we do that over Carnarvon, and that way if you have any good news for us or any instructions, you can give them to us at Hawaii and not interrupt our rest period.

01 02 09 41  CC  Roger. That's a sterling idea, Apollo 9.

01 02 09 47  CMP  Okay.

01 02 10 22  CC  Apollo 9, Houston.

01 02 10 26  CDR  Go ahead.

01 02 10 27  CC  Roger. One other item on the flight plan. Along in here any time, we would like to have you re-service the waterboiler.

01 02 10 39  LMP  Okay.

01 02 10 50  CC  Okay. And that is to just leave it off, Apollo 9. Just reservice it and leave it off.

01 02 10 55  LMP  Okay. I understand you want to reservice it and leave it off.
That is affirmative, and we are also picking up trouble with the DSE voice. We are showing about four discrete tones wiping out the voice on it, and we would like to have you verify your VHF configuration there; just as a first cut at it. We have got a handle on the problem.

Okay. We are in SYNTAX Alfa and everything else is off.

Apollo 9, Houston. Would you bring up your S-band volume. We are going to go over to Honeysuckle in a couple of minutes.

And for your info, FIDO tells us that we are within seconds of the proper setup on the rendezvous right now.

Roger. Good news. ...

We want to fix it before we get there.

(Laughter) Roger.

Apollo 9, Houston.

Houston, Apollo 9.

Roger. Could you trip your surge tank for us, please?

Roger. We're just filling the PLSS tank there.

Roger. Understand. Thank you.

Houston, we just filled the PLSS tank up to 600, and we've let the surge tank build back up again. We want to work that up this time.

Roger. Copy. We concur; we just wanted to verify our reading here on the surge tank.

Roger.
### COSS NET 1

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 02 18 18</td>
<td>CC</td>
<td>Just peering over your shoulder.</td>
</tr>
<tr>
<td>01 02 18 20</td>
<td>LMP</td>
<td>Yes. We didn't think you were watching.</td>
</tr>
<tr>
<td>01 02 18 23</td>
<td>CC</td>
<td>Big brother is ever watching.</td>
</tr>
<tr>
<td>01 02 18 27</td>
<td>CDR</td>
<td>Good.</td>
</tr>
<tr>
<td>01 02 18 29</td>
<td>CMP</td>
<td>How about big sister?</td>
</tr>
<tr>
<td>01 02 18 31</td>
<td>CC</td>
<td>Negative. Just old Screwy.</td>
</tr>
<tr>
<td>01 02 18 38</td>
<td>LMP</td>
<td>Hey, has old Golden Throat made it back yet?</td>
</tr>
<tr>
<td>01 02 18 41</td>
<td>CC</td>
<td>I haven't seen or heard from him.</td>
</tr>
<tr>
<td>01 02 18 49</td>
<td>CMP</td>
<td>How about Sonny? Is he there?</td>
</tr>
<tr>
<td>01 02 18 51</td>
<td>CC</td>
<td>I understand he is in the local area, but I haven't seen him over here yet.</td>
</tr>
<tr>
<td>01 02 18 57</td>
<td>CMP</td>
<td>Tell him we send our love.</td>
</tr>
<tr>
<td>01 02 18 59</td>
<td>CC</td>
<td>All right. Sure will.</td>
</tr>
<tr>
<td>01 02 21 25</td>
<td>CC</td>
<td>Apollo 9, Houston. We are about to come off with Honeysuckle, and we're going to try the Huntsville again this time through a satellite, so we'll see how, if the COMM has improved any.</td>
</tr>
<tr>
<td>01 02 22 58</td>
<td>CT</td>
<td>Two-way lock.</td>
</tr>
</tbody>
</table>

### HUNTSVILLE (REV 17)

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 02 23 27</td>
<td>CC</td>
<td>Apollo 9, this is Houston through the Huntsville. How do you read?</td>
</tr>
<tr>
<td>01 02 24 49</td>
<td>CC</td>
<td>Apollo 9, this is Houston through the Huntsville ... transmitting now ... trying to evaluate the COMMAND. Pretty noisy to me. Can you read me at all?</td>
</tr>
<tr>
<td>01 02 25 19</td>
<td>CC</td>
<td>Apollo 9, this is Houston. If you can read me and you've got the time, could you give me a short count, Houston.</td>
</tr>
<tr>
<td>01 02 25 35</td>
<td>LMP</td>
<td>3, 2, 1; Apollo 9 out.</td>
</tr>
<tr>
<td>01 02 25 40</td>
<td>CC</td>
<td>Roger, Apollo 9. I copied the 3, 2, 1.</td>
</tr>
</tbody>
</table>
And, Apollo 9, this is Houston. ... giving you a short count - maybe try to help set up their equipment. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Houston out.

Apollo 9, Houston. Do you read?

I read you weak, but clear.

Okay. Understand. Weak, but clear, and I copied you about the same on that one.

And, Apollo 9, Houston. Just for your info - We're trying these tests - trying to get some COMM set up here looking ahead to rendezvous day.

How do you read now?

Okay. You are coming through real weak; I can make it out, however.

That's the same for you. You are coming through clear but very weak.

Okay. Understand. Clear, but weak. Are you getting this background static?

There is some background static, but not tremendous.

Roger. Copy.

And, Apollo 9, this is Houston. We'll have you over Hawaii at about 34, and at that time, we would like to get a long count from you from about 15 seconds while we work some ground COMM equipment at that time. I'll give you a GO on your count.

Roger. Apollo 9.

END OF TAPE
HAWAII (REV 17)

01 02 35 07 CC Apollo 9, Houston through Hawaii. How do you read?
01 02 35 13 LMP You're coming in about four-by-five, Houston.
01 02 35 18 CC Apollo 9, say again.
01 02 35 22 LMP Roger. You are coming in five-square now.
01 02 35 25 CC Real good. Stand by one here; let me check — see if we are ready for your long count.
01 02 35 38 CC Okay. Apollo 9, this is Houston. We would like to start in about 30 seconds. And what we need is — we are trying to get this equipment set up for rendezvous day, and we need a long, slow count, up to about 15 seconds. Bring it on pretty slow here for us, because we will be changing some ground antenna configurations during your count.
01 02 36 01 LMP Roger.
01 02 36 09 CC Okay. Apollo 9, Houston. You can begin the count any time.
01 02 36 16 LMP Okay. Long ... starting: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 9, 8, 7, 6, 5, 4, 3, 2. Did I miss any?
01 02 36 50 CC Roger. We copied all that except for 1, but we really — it was really enlightening down here. We switched some configuration right about 5 and you went down at a fairly low level; you popped right up to five-square, and we'd like to repeat this test again in about a minute — minute-and-a-half.
01 02 37 18 LMP Okay. We'll choose that five-square configuration for rendezvous.
01 02 37 22 CC That's affirmative.
01 02 37 30 CC In fact, we might just do you one better; we might just use that from now on, as well as the rendezvous.
01 02 37 39 LMP What did you all do, turn on the receiver?
01 02 37 42  CC  That's about it.
01 02 38 13  CC  Apollo 9, Houston. We would like to have you repeat that test, please.
01 02 38 18  LMP  Okay. Long count coming: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1. How was that?
01 02 38 48  CC  That was real good, appreciate that, think we got some good data there.
01 02 38 54  CDR  Good little performance, didn't he?

TExAS (REV 18)

01 02 51 10  CC  Apollo 9, Houston.
01 02 51 11  LMP  Go ahead, Houston.
01 02 51 14  CC  Roger. We'd like to uplink you a state vector in the target load if you'll give us FOO in ACCEPT.
01 02 51 21  LMP  Okay. You've got it.
01 02 51 23  CC  Okay. And if you'd drag out your pads, I'll have an SPS-4 PAD for you in about 1 minute.
01 02 51 30  LMP  They're cut; just say when.
01 02 51 32  CC  Okay.
01 02 53 17  CC  Apollo 9, Houston. I have SPS-4 PAD.
01 02 53 39  CC  Apollo 9, Houston. I have SPS-4 PAD ready to read.
01 02 53 42  LMP  Roger. Houston, Apollo 9. How do you read? We are ready to copy.
01 02 53 46  CC  Roger. Reading you five-square. Reading: 028 244030, minus 00012, minus 03 009 all sips 03 009 029 45 0283 32743, plus 150, minus 069 26 245 60 25 100, minus 17 37, plus 139 70 2092. End of update.
01 02 55 24  CMP  Houston, Apollo 9. Do we have time for the readback?
That's affirmative; we've got time here. We may have a handoff here to Bermuda, but go ahead; it shouldn't break us up.

Okay. Reading back: 028 244030, minus 00012, minus 03 009 all zip 03 009 029 45 0283 32743, plus 150, minus 069 26 245 60 25 100, minus 17 37, plus 139 70 2092. Over.

BERMUDA (REV 18)

Roger. Houston confirms that, and we went right through that handoff without losing a digit.

Fantastical. Hey Smokie, got a minute?

Hey, when we flew across Texas a minute ago I looked down and I thought I saw a whole bunch of flags flying in Nassau Bay. And if I did, would you thank all those people down there for us?

All right; sure will. They probably heard you here over our friendly radio station.

Alrighty; tell them we all think it's pretty neat.

All right. And Apollo 9, the computer is yours; we have sent you a state vector and a target load.

Roger. Understand. We got the computer state vector and a target load.

Houston, this is Apollo 9. We did another realign before SPS-3 before we got the torqueing angles and the times; we'll give it to you when we get the other ones that we haven't already. Houston, you still with us?

Roger. I copy that. Apollo 9, I'm trying to look back at - the last time we got them from you was 24 plus 28 plus 00.
(GOSS NET 1)

01 02 57 45 CMP Yes, we have some delta ones here, Houston. You ready to copy?
01 02 57 49 CC Roger. Go ahead.
01 02 57 52 CMP Okay. Plus 00006, plus 00010, minus 00022, and the time was 24 31 00.
01 02 58 10 CC Roger. Copy. Thank you.
01 02 58 14 CMP That was the second alignment before that burn.
01 02 58 17 CC Roger. Understand.
01 02 58 21 CDR Figure that one and make sure.
01 03 00 23 CC Hey, we're getting better.
01 03 00 27 LMP Last time you were perfect.
01 03 00 30 CC Okay.
01 03 00 32 CDR If you keep this up you will figure out where we are.
01 03 00 37 CC Hey, I was just looking at the difference in the - in your vectors on the tube here, and it is almost all zeros. You've really got a winner on board there.
01 03 00 49 LMP You mean our computer?
01 03 00 53 CC That's affirmative. Yes, in a comparison between your onboard vector and the ground vector is almost no error between the two. CMP has really been tracking good.
01 03 01 05 CMP Say, one thing I'm still a little concerned about is, every time average G comes on at T minus 30 there, we're picking up almost a foot per second in that 30 seconds waiting for the burn to start.
01 03 01 19 CC Roger. We copied your query on that before, and everybody says that that is well within the tolerance. I looked through the checklist here and it says as long as it is less than 2 feet per second in 5 seconds, it's OK.
01 03 01 37 CMP Yes, but we want to be perfect.
CC 01 03 01 39  I see. You want to trim those --

CDR 01 03 01 40  I guess we've just never seen this much before in SIMs.

LMP 01 03 01 42  It is sort of unusual to see anything, really.

CC 01 03 01 49  Yes. We agree with that. I guess that's probably a good thing; we ought to load some in the simulator.

CMF 01 03 01 57  Probably be a good idea.

CC 01 03 01 58  Hey, if you got a minute for a question, I'm curious about your windows. Are they fogged up? How is your visibility?

LMP 01 03 02 08  I just took a picture of the left hand rendezvous window and it's starting to fog up around the sides. It looks like some sort of film on the outside of the outer pane - or the inside of the outer pane; it's hard to tell. It has moved in from the edge about a half an inch, now, on the far right side and all the way down and about 4 inches down from the top on the left side from the top of the apex. And the hatch window has got a big circle in the middle of it. It's beginning to fog up.

CC 01 03 02 46  Roger. Copy that. Sounds like the problem's still with us, then.

LMP 01 03 02 53  And windows 4 and 5 are clear. I don't see any trouble with them at all. And be advised that hatch window - it's a pretty light coating, still.

CC 01 03 03 06  Roger. Understand.

CMF 01 03 03 07  It almost looks like it goes away when the sun shines on that - that and window number 1.

CC 01 03 03 14  Roger. Copy. And --

CDR 01 03 03 19  Window number 1 seems to fog up periodically, but I'd say for the most part really they are pretty good.

CC 01 03 03 30  Roger. Understand. And I got a few words of wisdom on the cryo tanks for tonight.
(GOSS NET 1)

01 03 03 40 CMP Okay. Go ahead.

01 03 03 43 CC Roger. You are starting to fade out on me a little bit. We still got some time here with you, but tonight we'd like to just about repeat the plan that we did last night. At this time go ahead and turn off the heaters in both H₂ tanks. Allow the pressure to drop to 175 psig, and use the heaters to keep the pressure from going below 175, and then prior to the sleep period we'll turn on the fans and H₂ tank number 2. We hope that it will keep the pressure up during the night.

01 03 04 28 CMP Okay. We've got the heaters off now and you want us to let it go down 175 - keep it to 175 using the heaters, and then tonight use H₂ fan number 2 rather than 1.

01 03 04 44 CC That's affirmative.

01 03 04 48 CMP Roger.

(CANARY (REV 18))

01 03 09 00 CC Apollo 9, Houston. We are showing a pretty big middle gimbal angle there.

01 03 09 06 CMP Roger. We got a ...

01 03 09 36 CMP Houston, Apollo 9. What's your temperatures on the quads for the burn here - on the roll quad?

01 03 09 44 CC Roger, Apollo 9. Copy. Stand by.

01 03 09 47 CMP Okay. We've been using E and D because they show highest up here, but if you have any other preferences, let us know.

01 03 09 55 CC All right. Understand. You are going to plan on using Baker and Delta unless we advise you otherwise.

01 03 10 00 CMP That's affirm.

01 03 10 02 CC Okay.
And, Apollo 9, Houston. We are losing you at Canaries. We will see you at Tananarive about 25. Excuse me - Ascension here coming up real soon. Sorry about that.

ASCENSION (KEX 18)

Apollo 9, Houston. Do you read?

Houston, Apollo 9.

Go ahead, Apollo 9.

Roger. You called?

Yes. We've got one other question for you on the FGSS system. Rusty commented that he switched from PRIME or NORMAL to AUX. We would like to know if the meter changed when you switched, and if it did, the readings before and after.

Okay. The answer is yes. It did change. The unbalance tended to decrease but then it came back up again, and it also caused the MASTER ALARM to go on and off and so I switched back to NORMAL. Both NORMAL and AUX indicate an increase in the oxidizer unbalance. I can't give you a quantity reading on the auxiliary system because it was moving. For your information, during the burn the oxidizer unbalance jumped all around.

Okay, Apollo 9. We copied that. Thank you very much.

Okay. And if you can't think of anything better to do with it, we might consider shutting it off on some of these later burns, because it's taking a lot of time to reset the MASTER ALARMS in the middle of a burn.

Roger, Apollo 9. We've been considering that and unless we can come with something better, that is probably going to be our recommendation. We are still trying to troubleshoot it; that is the purpose for this question.

Okay. Besides that, it changes the pulse rate, too.
I'm sorry, Apollo 9. Change of what? I didn't catch your last statement.

I say, the MASTER ALARM changes the heart rate.

(Laughter) Roger. Understand. We didn't notice that down here. You looked cool as a cucumber.

Sweaty palms.

TANANARIVE (REV 18)

Apollo 9, this is Houston through Tananarive.

Okay. I'm reading you okay - just standing by here. We'll have you for about 8 minutes across Tananarive.

Roger. Do you want to copy the torquing angles?

Roger. Go ahead.

Okay. Plus 00298, minus 00374, minus 00649.

Roger. I copy.

Beginning of the time will be 27 28 00.

Roger. Copy time 27 28 00, and I copied angles.

Roger.

And, Apollo 9, we'll see you over Carnarvon in about 42.

CARNARVON (REV 18)

And, Apollo 9, Houston through Carnarvon.

Roger.
01 03 42 05  CC  And you're loud and clear. And, Apollo 9, I would like to close a loop on an item I mentioned a while back about the DSE voice interference. Evidently that was a ground playback problem; we've run your last dump through and it's real good, so that DSE voice is okay.

01 03 42 26  CDR  Okay, fine.

01 03 43 50  CC  And, Apollo 9, Houston. Another item: fuel cell 3 02 flow looks normal to us. It's settled back down.

01 03 43 59  CMP  Yes, it does look like it is coming down again.

01 03 44 22  LMP  And, Houston, Apollo 9. Do you plan to have us charge BATT A tonight?

01 03 44 30  CC  Copy, Apollo 9. Stand by.

01 03 44 38  CC  And, Apollo 9, that is affirmative.

01 03 44 42  LMP  Roger. Thank you.

01 03 46 16  CC  Apollo 9, Houston.

01 03 46 20  LMP  Go ahead.

01 03 46 21  CC  Roger. Another question on our FUGS problem. Have you tried the test switch on this?

01 03 46 32  LMP  That's a negative.

01 03 46 36  CC  Roger. Understand. Have you got time to run that for us now, Rusty? If we so request it?

01 03 46 46  LMP  Sure do.

01 03 46 48  CC  Okay. Stand by one. Okay. Okay, Rusty. We would like to have you do that. I'm sure you are familiar with this procedure, but we would like to have you know your values now so you can return to those. And a caution on this is to not stay in position 1 or position 2 longer than 10 seconds. And we would like it run in both NORMAL and AUX.

01 03 47 15  LMP  Okay. Understand you want to do it in both NORMAL and AUX, and let me know when you are ready. You want test 1 and test 2 in both of them.
That is affirmative. And as I say, note here that you will have to note your values so you can bring it back to your present values now.

Okay. I'll give you about 8 seconds. We are starting and - you ready to go?

Roger, Apollo 9. We can't - We can't monitor this; we would just like to have you do it on board and we would like to have you go up and down, back to the present values and NORMAL and PRIMARY, and then the same thing in AUX. And give us a few words of wisdom as you proceed through it.

Okay. In work.

Okay.

Okay, Houston. I just ran test 1 in PRIMARY, rather in NORMAL, and in 10 seconds I got no motion at all. The MASTER ALARM light did come on after about 5 seconds, but no motion at all on the counters and for that reason I don't think I will go down to test 2. I may not be able to get it back up where it belongs.

Roger. We copy that. Stand by one. That's a pretty definite test of some sort, so stand by one, Apollo 9.

Roger. And any time you want to give me a GO, I'll go ahead and run the same test in AUX.

Okay. Stand by.

And Apollo 9, this is Houston. We're about to lose you here at Carnarvon. We'll see you at Huntsville at about 59.

Roger. Do you want me to try and test it in AUX or are you still thinking about it?

Well, our plan is that we're going to have you disable these - the PUGS for this burn and we'll talk about that over the Huntsville or Hawaii; we're coming up on 30 minutes of the burn, and we figure we should just go ahead and chuck it for this one.

Okay.
Apollo 9, this is Houston through the Huntsville. When do you read?

Huntsville M&O, Houston CAP COMM. How do you read?

Houston CAP COMM, Huntsville M&O. Read you loud and clear. We have not established valid two-way lock yet with the spacecraft.

Roger. Understand. Would you give me a call when you do?

Roger. Wilco.

Hello. Houston, Apollo 9.

Apollo 9, Houston. You are loud and clear.

Weak, but --

Apollo 9, this is Houston. I read you loud and clear. How me?

Okay, Apollo 9, this is Houston. I think you are reading me. We are recommending that we turn the FUGS off for this burn. We would like to have you turn the SPS gaging switch off. We would like to have you pull 2 circuit breakers on panel 6; they are the heater gaging circuit breakers MAIN A, MAIN B.

And, Apollo 9, this is Houston. I am not reading you at all.

Houston CAP COMM, this is the Huntsville M&O. At the time we were talking to the spacecraft we had valid two-way lock, and we've lost it presently.

Roger. You say I did have two-way lock at the time of my transmission?

Roger. During the brief transmission you had two-way lock; presently you do not have it. The signal is very weak.
(GOSS NET 1)

01 04 02 12  CC  Roger. Understand. Thank you.
01 04 03 09  LMP  Houston, Apollo 9. How do you read now?
01 04 03 12  CC  Apollo 9, this is Houston. I read you loud and clear. Did you copy my last transmission?
01 04 03 17  LMP  That's a negative. You were way down in the mud.
01 04 03 20  CC  Okay. We're recommending that you disable the FJOS for this burn. We would like to have you turn the SPS gaging switch off, and pull the two circuit breakers on panel 8, labeled SPS HEATER GAGING, MAIN A, MAIN B.
01 04 03 40  LMP  Roger. SPS gaging OFF, and the breakers are OPEN.
01 04 03 44  CC  Okay. Very good. Thank you, Apollo 9.
01 04 03 48  LMP  Roger.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

CC CDR

Roger.

CC

And, Apollo 9, this is Houston. We are losing you over the Huntsville; we'll see you over Hawaii at 10.

CDR

Houston, this is Apollo 9. You are breaking up very badly, lots of noise, and the S-band's cutting you out there.

CC

Roger. We'll see you over Hawaii at 10.

CDR

Roger. Hawaii at 10. You came through pretty good that time if you want to try again.

CC

No, I was just telling you we were LOS.

HAWAII (REV 18)

CC

Apollo 9, this is Houston through Hawaii. Standing by.

CDR


CC

Roger. You are loud and clear, and we'll have your GO/NO-GO shortly. Let everybody take a look at your data.

CDR

Okay.

CC

Apollo 9, this is Houston. You are GO for SPS-4.

CDR

Apollo 9. Roger.

CC

And, Apollo 9, Houston. I copy your residuals as plus 00003, plus 00035, plus 00032.

GFP

Roger. That's correct for the DELTA-V curve, that's a minus 6.2.

CC

Roger. Minus 6.2.

CC

And, Apollo 9, Houston. I copy the order.

CMP

Roger.
(COSS NET 1)

01 04 26 27 LMP Roger.
01 04 26 30 CMP That was a good burn.
01 04 26 32 CC Roger. Understand. Looks good here.
01 04 26 35 CMP You're really ...
01 04 27 11 LMP And, Houston, do you want us to begin charging BATT A?
01 04 27 19 CC That's affirmative, Apollo 9. Let's start charging battery A.
01 04 27 24 LMP Okay.
01 04 28 41 CDR Houston, this is Apollo 9.
01 04 28 45 CC Go, Apollo 9.
01 04 28 47 CDR We just want to advise you that the command and service module now weighs less than the LM.
01 04 28 52 CC Roger. Copy.
01 04 29 01 CC Hey, Jim, I think you must like the heavy jobs. Soon as you got this one lighter - How tomorrow you are going to crawl into the heavy one.
01 04 29 08 CDR Yes. I always have been in favor of heavies.
01 04 29 11 CC (Laughter) Roger.
01 04 29 16 CMP You notice the way we end up, though, at the end of the run.
01 04 29 19 CC Okay.

TEXAS (REV 19)

01 04 32 58 CC Apollo 9, Houston.
01 04 33 00 LMP Go ahead.
01 04 33 01 CC Roger. Our CCM dropped down there a little bit right when you were commenting on your MASTER ALARM during the burn. Would you repeat that?
01 04 33 07 LMP Roger. The comment was that it was a real good burn and we didn't have any MASTER ALARMS that time.
Roger. Well, the white hats picked up one on that.

We had one caution light, but it was on before the burn, so I guess that's okay.

That's right.

SIM SUP must be falling down on his job.

We'll talk to him about that; see what he can do for you tomorrow.

... No thanks - okay?

Okay.

BERMUDA (REV 19)

Houston, did you call?

Apollo 9, Houston.

Go ahead, Houston. Apollo 9.

Roger. Just for your info, that Y-residual on that burn took out those few seconds that we were off on the rendezvous and now we are trying to measure it in centiseconds.

Good. We've got just the computer that can take centiseconds.

Okay.

I have something to tell you; he's going to have to. If that doesn't work, you can just make the numbers smaller and smaller.

Okay.

Houston, Apollo 9.

Apollo 9, go.

Are you going to leave the SPS gaging circuit down for the rest of the flight?
01 04 37 53  CC  We haven't really decided on that yet, Apollo 9. I guess it depends on how our troubleshooting goes.

01 04 37 59  CMP  Okay. We will just stand by for whatever you want to do, then.

APOLLO 9 (REV 19)

01 04 38 02  CC  Roger. If we can come up with some good ideas, we will work on it.

01 04 38 07  CMP  Roger.

01 04 38 19  LMP  Houston, Apollo 9.

01 04 38 23  CC  Apollo 9, go ahead.

01 04 38 25  LMP  Roger. We would like to know what your plans are for purging of the fuel cells, if any.

01 04 38 30  CC  Roger. We would like to have that O₂ purge as we talked about before over Carnarvon. And stand by here; we will see if we got any other on that. And we would like to have an E memory dump at this time. We're standing by now on your mark.

01 04 38 50  LMP  Okay. 3, 2, 1.

01 04 38 52  LMP  MARK.

01 04 38 53  LMP  E memory dump.

01 04 39 25  LMP  Houston, we are going to fill the PISS tank again so the surge will be coming down.

01 04 39 30  CC  Roger. Understand.

01 04 40 30  CC  And, Apollo 9, this is Houston. We've got about 1 more minute at Antigua, and then we will see you over Ascension at 46.

01 04 40 42  LMP  Roger. Ascension 46.

ASCENSION (REV 19)

01 04 46 55  CC  Apollo 9, Houston.

01 04 47 07  CC  Apollo 9, Houston through Ascension.
<table>
<thead>
<tr>
<th>Time (hh:mm:ss)</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 04 47 12</td>
<td>CDR</td>
<td>Roger. Houston, Apollo 9.</td>
</tr>
<tr>
<td>01 04 47 14</td>
<td>CC</td>
<td>Hello. Tremendous COMM this pass. We'd like to have POO in ACCEPT. We'd like to give you a state vector.</td>
</tr>
<tr>
<td>01 04 47 21</td>
<td>CDR</td>
<td>Roger. You've got it.</td>
</tr>
<tr>
<td>01 04 47 23</td>
<td>CC</td>
<td>Understand.</td>
</tr>
<tr>
<td>01 04 47 50</td>
<td>CC</td>
<td>And, Apollo 9, Houston. I have a NAV check to go along with the state vector ...</td>
</tr>
<tr>
<td>01 04 48 01</td>
<td>CMP</td>
<td>Roger. Go ahead with your NAV check.</td>
</tr>
<tr>
<td>01 04 48 03</td>
<td>CC</td>
<td>Roger. Reading NAV check: 029 40 all zips, plus 12 27, plus 16 044 135 8.</td>
</tr>
<tr>
<td>01 04 48 35</td>
<td>CMP</td>
<td>Roger. Reading back: 029 49 all zips, plus 12 27, plus 16 044 135 8.</td>
</tr>
<tr>
<td>01 04 48 46</td>
<td>CC</td>
<td>Roger. Confirm the update.</td>
</tr>
<tr>
<td>01 04 49 23</td>
<td>CC</td>
<td>Apollo 9, Houston. You have both the state vector clocks loaded. The computer is yours.</td>
</tr>
<tr>
<td>01 04 49 30</td>
<td>CMP</td>
<td>Roger. Computer's ours; thank you.</td>
</tr>
<tr>
<td>01 04 50 10</td>
<td>LMP</td>
<td>You guys were perfect again.</td>
</tr>
<tr>
<td>01 04 50 15</td>
<td>CC</td>
<td>Roger. I see it on there now. With a little practice, by gosh, we may make it yet.</td>
</tr>
<tr>
<td>01 04 50 27</td>
<td>LMP</td>
<td>Roger. And we're ready for block data any time you got it.</td>
</tr>
<tr>
<td>01 04 50 31</td>
<td>CC</td>
<td>I'm sorry about that, Rusty. We don't have that yet. We'll try to catch that - I know it's through your eat period here, but we're going to have to catch it over Carnarvon, some spot over there, during the next hour.</td>
</tr>
<tr>
<td>01 04 50 44</td>
<td>LMP</td>
<td>Okay. Fine.</td>
</tr>
<tr>
<td>01 04 50 54</td>
<td>LMP</td>
<td>And, Houston, we're going to be powering down the G&amp;W here.</td>
</tr>
<tr>
<td>01 04 50 59</td>
<td>CC</td>
<td>Roger. Understand. Any time.</td>
</tr>
<tr>
<td>01 04 51 03</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
</tbody>
</table>
And, Apollo 9, if you would like to do that O₂ purge now that would be one less thing you would have to do next hour. We've still got you here at Ascension for almost 6 minutes.

Okay. We'll run through that O₂ purge right now.

Roger. Understand you are starting an O₂ purge. Very good.

And, Apollo 9, Houston. Just for your info - why we're late on the block data is the weather has turned pretty bad in some areas and we had to shift the areas.

Roger.

In fact, it looks like we are going to have to keep you flying or either land you out here in - off Redfish Isle in Galveston Bay.

Why don't we just stay up for a few days?

Okay. That sounds like a good idea.

The food and bubbly are holding out all right.

Tremendous. And Apollo 9, another thing I would like to get from you would be your RCS quad - your onboard readout, quantity, and your thruster temp.

Roger. I'll be right down with them.

Okay.

Okay. Purge is complete.

Roger. Copy purge complete.

Houston, here is the RCS quantity if you want to copy.

Roger. Go ahead.

A quad is 79 percent, B is 82, C is 79, D is 82.

Roger. I copy 79, 82, 79, 82.

That is all.
And, Houston, stand by on the injector temps for just a second.

Roger. Understand.

Houston, Apollo 9. We'll get you with the injector temps on next station.

Roger. We're about to lose you here at Ascension and the next station is Tanariva at about 04, but our COSM has been pretty bad. I won't even try to talk with you unless you contact us, and I'll contact you next over Carnarvon at 19.

CARNARVON (KSV 19)

Apollo 9, this is Houston through Carnarvon. Standing by.

Okay, Houston. You're coming in five-square. How ya?

Oh, it's sterling. Five-square.

Okay. And we've got some readouts for you. Did you copy the RCS?

We copied the RCS quantities.

Okay. Here are the BATT voltages: BATT C, 37.0; pyro A, 37.1; pyro B, 37.1; and I've got the injector temperatures for you.

Roger. I copy the battery voltages; go with the injector temperatures.

Roger. 5C and D, OFF SCALE HIGH; 6A and B, OFF SCALE HIGH; 6 Charlie and Delta are, respectively, 4.0 and 4.6.

Roger. Copy 5 Charlie and Delta, OFF SCALE HIGH; 6 Alfa and Bravo, OFF SCALE HIGH; and Charlie and Delta, 4.0 and 4.6.

That's Charlie.

Okay. And we'd like to confirm with you that before you shut out you'll turn the fan on in H2 tank 2.
Roger. We will, and be advised that it doesn't look like we're going to get down to 175.

Roger. We confirm that. And another thing, we'd like to recommend that tonight you turn your VHF B receiver off. We will be guarding that frequency on the ground, and we will be monitoring the spacecraft, and if we can't get through to you on A - VHF A - we'll use the CWM ALERT.

Okay. We'll turn Bravo off. You want us to stay just in SIMPLEX A.

That is affirmative. SIMPLEX Alpha and turn off your VHF B.

Okay. We're SIMPLEX Alpha at this time, and we're ready with the block data then.

Roger. It'll still be a little bit - the weather is shifting those sites around. I do not have the block data for you yet; and I would like to confirm that we will be monitoring B-frequency if you need to bring it up in transmit.

Roger. Understand you'll be listening on B also. Thank you.

Roger.

Apollo, Houston.

Go ahead. Houston, Apollo.

Roger. I've only got about 2 minutes here at Carnarvon. I'd like to start the block data, though, and finish it up over Guan.

Okay. Ready to copy.

Roger. Sending block data: 021 4 Alpha, plus 325, minus 1610 02 2.4 34 3859; 022 4 Charlie, plus 259, minus 1610 03 1 910 3859; 023 4 Charlie, plus 145, minus 1573 03 56 03 4856; 024 Alpha Charlie, minus 216, minus 0070 03 24 11 5397. I believe I've lost you.
01 05 33 35  CC  Apollo 9, Houston. Do you read through Guam?
01 05 33 40  LMP  Houston, Apollo 9. Roger. We read you; how are you?
01 05 33 43  CC  Roger. I read you five-square. How far did I get?
01 05 33 47  LMP  Okay. I got to the last line in 24 Alfa Charlie, and I got a 53 there, and that is all.
01 05 33 54  CC  Okay. The last line in Alfa Charlie is 5397, and reading on the next one: 025 4 Charlie, minus 178, minus 1620 039 13 13 8020. The last one: 026 Alfa Charlie, minus 042, minus 0260 039 33 59 4000. That's the end of the update. I would like to go back to the third line and 4 Charlie - 023 4 Charlie, the third one I read. The third line in that should be minus 1625. And the - your SP4 trim angles: pitch, minus 0.9, yaw, minus 0.7.
01 05 35 36  LMP  Okay. A readback on them all. Do we have enough time to read them all back?
01 05 35 40  CC  Apollo 9, before you start the readback, we would like to have you turn on the $H_2$ purge heaters; and what we are working up to is just before your rest period, it looks like we are going to have to purge to get the pressure in $H_2$ cryo tanks down to 175.
01 05 36 03  LMP  Roger. We've got the $H_2$ purge heater on.
01 05 36 07  CC  Understand. And I am ready for the readback.
01 05 36 14  LMP  Roger. 021 dash 4 Alfa, plus 325, minus 1610 032 44 34 3359; 022 4 Charlie, plus 259, minus 1610 034 19 01 3359; 023 4 Charlie, plus 145, minus 1625 035 56 03 4656. Are you still with us?
01 05 36 59  CC  Roger. We've got 3 minutes left.
01 05 37 02  LMP  Okay. 024 Alfa Charlie, minus 216, minus 0070 036 24 11 5397; 025 4 Charlie, minus 178, minus 1620 039 13 13 8020; 026 Alfa Charlie, minus 042, minus 0260 039 33 59 4000. Pitch 0.9, yaw 0.7. That is a minus and a minus.
01 05 37 53  CC  That is affirmative. Houston confirms that update. We still have about 2-1/2 minutes left in this pass and we will see what our words of wisdom are on the tanks, and that should be the last time we will have to talk to you tonight, I believe.

01 05 38 07  CHP  Okay.

01 05 38 10  CDR  Can we talk to you if we want to?

01 05 38 26  CC  Okay, Apollo 9. The way we would like for you to do it is, after your time is up on the heater, to go ahead and do a purge as required to get it down to 175; and discontinue the purge, turn the heaters off and turn the fan on in tank 2.

01 05 38 44  LMP  Roger. Understand when the 20 minutes are up, you want us to purge H₂ on all three fuel cells until the cryo gets down to 175. Discontinue the purge, turn the fan on in tank 2, and back out.

01 05 39 02  CC  That is affirmative. One other item I would like to get, if you can give it to us, is a dosimeter reading.

01 05 39 09  LMP  Roger. Stand by; I'll give you mine. ...

01 05 39 40  CC  Apollo 9, if that was a transmission, I didn't get it.

01 05 39 52  CC  Apollo 9. Do you read Houston?

END OF TAPE
Apollo 9, Houston through Hawaii.

Go ahead. Houston, Apollo 9.

Roger. If you'll give me a dosimeter reading, I'll be quiet for the rest of the night.

Roger. The dosimeter for Dave, 6102. My dosimeter is packed down in the bottom of my seat. If you really want it, I'll unpack it. If you don't need it, I'll delay it until tomorrow and give it to you.

That's negative. We don't want you to unpack it and the first one was for Dave, is that right?

6102 is Dave's.

Okay. I got that.

You already got Rusty's, didn't you?

And I did not get Rusty's. Could you give me that one?

Oh, okay. Just a minute.

That's 8002.

Roger. 8002. And with that we'll close out. What we'd like to have you do in the morning would be to give us an evaluation of your sleep in hours, if you could, for tonight and the first night. We don't want to bother you with that now, and unless you have something else, why, Smokey bids you a fond night's sleep.

Okay. Thanks very much. Would you tell my family I said, "Hello."

Roger. Will do that.

Apollo 9, this is Houston. You don't even have to answer me, but if you don't get that filter changed as shown on the 30 hours, you're going to have a MASTER ALARM before your rest period ends.
<table>
<thead>
<tr>
<th>Time</th>
<th>Node</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 06 16 43</td>
<td>IMP</td>
<td>Roger, Houston. Understand. If we don't get the LION canister changed before 30 hours we'll have a MASTER ALARM before the end of our rest period!</td>
</tr>
<tr>
<td>01 06 16 58</td>
<td>CC</td>
<td>That's affirmative. It's shown in the flight plan and I just wanted to remind you before we got too far into the rest period.</td>
</tr>
<tr>
<td>01 06 17 04</td>
<td>CDR</td>
<td>That's all right. You know what I told you about little reminds.</td>
</tr>
<tr>
<td>01 06 17 10</td>
<td>CDR</td>
<td>Anytime your little heart desires to remind us, you do that.</td>
</tr>
<tr>
<td>01 06 17 27</td>
<td>CDR</td>
<td>How are things in Houston, there, Smokey?</td>
</tr>
<tr>
<td>01 06 17 30</td>
<td>CC</td>
<td>Say again.</td>
</tr>
<tr>
<td>01 06 17 31</td>
<td>CDR</td>
<td>How are things in Houston? Now that we're not working I want to talk to you.</td>
</tr>
<tr>
<td>01 06 17 35</td>
<td>CC</td>
<td>Negative. We refuse to talk to you; it's a rest period. The only thing we want is you to answer one question. Did you happen to move the B3 thruster switch - B1 thruster switch?</td>
</tr>
<tr>
<td>01 06 17 44</td>
<td>CDR</td>
<td>Roger. I did.</td>
</tr>
<tr>
<td>01 06 17 46</td>
<td>CC</td>
<td>Okay. Very good. That solves that problem and we've reminded you of the canister and that will keep you from getting a MASTER ALARM and we're not going to answer you anymore.</td>
</tr>
<tr>
<td>01 06 17 55</td>
<td>CDR</td>
<td>What are you, a smart guy?</td>
</tr>
<tr>
<td>01 06 17 58</td>
<td>CC</td>
<td>No, sir.</td>
</tr>
<tr>
<td>01 06 17 59</td>
<td>CDR</td>
<td>Which one of those good teams is on right now, Gold or White or Orange?</td>
</tr>
<tr>
<td>01 06 18 03</td>
<td>CC</td>
<td>It's the G-squared team, good Gold.</td>
</tr>
<tr>
<td>01 06 18 08</td>
<td>CDR</td>
<td>Good Gold.</td>
</tr>
</tbody>
</table>

END OF TAPE
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

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REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND TRANSCRIPTION

Tape 26/1
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(GOSS NET 1)

GUAM (REV 25)

01 15 20 24 CC Good morning, Apollo 9. Houston calling.
01 15 20 45 CDR Good morning, Houston. Apollo 9.
01 15 20 48 CC Roger. I'm a long ways away, so you can't hit me for waking you up.
01 15 20 53 CDR Say again.
01 15 20 54 CC I'm a long ways away, so you can't swing and hit me on waking up.
01 15 21 09 CDR Okay. How's everything looking down there?
01 15 21 07 CC It's looked beautiful all night; kept it so quiet here that we didn't have too much to do.
01 15 21 13 CDR Oh. Very good.
01 15 21 20 CC I have a lot of good information here: flight plan update, consumables, and some block data when you get around to copying some of it.
01 15 21 30 CDR Okay. Stand by one.
01 15 22 49 CDR Okay, Houston. Go with your flight plan update.
01 15 22 57 CC Roger. At time about 39 plus 55, primary glycol accumulator refill. Fill to 50 to 55 percent, LMP 2 dash 7 step 4. Over.

HUNTSVILLE (REV 25)

01 15 23 53 CDR ... 39, plus 55 primary glycol accumulator refill; fill to 50 to 55 percent ...
01 15 24 12 CMP Houston, 9. Did you get the readback?
01 15 24 15 CC Houston. Roger. Came through kind of weak, but it was okay. Change. Move S-band conference MSFN relay up to 44 plus 18 over Honeysuckle. Systems page 27. Over.
01 15 25 00 CDR Okay. Move S-band conference MSFN S-band relay up to 44 plus 18 over Honeysuckle. Systems page 27.
Tape 26/2
Page 121


01 15 25 45  CDR  Roger. Move CSM one-way relay up to 45 plus 38 over Carnarvon. Systems page 31.

01 15 25 56  CC  Roger. That's all of the general things. We're going to try to give your state vector and your reference - REPSIMATS; we'll send it over Guam at 40 plus 51.

01 15 26 13  CDR  Roger. 40 plus 51 for the state vector REPSIMATS.

01 15 26 19  CC  Roger. And I have your consumables.

01 15 26 25  CDR  Roger. And the consumables. Okay.

01 15 26 28  CC  GET 039 75 17 76 22 81 22 76 22 528 44 36 31 39. Over.

01 15 27 11  CDR  Okay. 039 75 17 76 22 81 22 76 22 528 44 36 31 39.

01 15 27 35  CC  9, Houston. Your readback is correct.

01 15 27 38  CDR  Roger.

01 15 28 39  CMP  Houston, 9. Did you want to go through the block-data, too?

01 15 28 42  CC  Roger. I have it if you're ready.

01 15 28 45  CMP  Okay. Go.

01 15 28 47  CC  Roger. 027 Alfa Charlie, plus 090, minus 0310
041 15 03 3529; 028 2 Alfa, plus 249, minus 0264
043 02 57 3001; 029 Alfa Charlie, plus 317, minus
0285 044 16 3560; 030 2 Charlie, plus 340,
minus 0290 046 24 14 3859; 031 2 Charlie, plus 321
minus 0320 047 58 31 3859; 032 2 Lima, plus 253,
minus 0330 049 34 33 4358. Your SPS trim: pitch
minus 0.9; yaw, minus 0.7. Over.

ASCENSION (REV 26)

01 16 12 19  CC  Apollo 9, Houston through Ascension.

01 16 12 39  CC  Apollo 9, Houston through Ascension.
(GOSS NET 1)

01 16 13 00 CC Apollo 9, Houston.
01 16 13 21 CC Apollo 9, Houston.
01 16 13 26 LMP Go ahead.
01 16 13 28 CC Roger. If you haven't already done it, we'll set up our hydrogen tank 1 and 2 heaters to AUTO and the fans OFF for the day.
01 16 13 42 LMP Okay. Heaters 1 and 2 to AUTO and the fans OFF.
01 16 13 45 CC Roger. And I have your block data if you're ready to copy.
01 16 13 50 CMP Okay. Stand by one, please.
01 16 13 52 CC Roger.
01 16 13 56 CMP Houston, how long's this pass?
01 16 13 59 CC They got a keyhole; we only have about a minute and a half here yet.
01 16 14 04 CMP Okay. Stand by.
01 16 14 23 CMP Okay. Go ahead, Houston. How about starting with 28 dash 2A?
01 16 14 28 CC Roger. 028 dash 2A Alfa, plus 249, minus 0264 043 02 57 3001; 029 Alfa Charlie, plus 317, minus 0285 044 46 10 3569; 030 2 Charlie, plus 340, minus 0290 046 24 14 3859. And, 9, Houston. You still with me?
01 16 16 13 CC Apollo 9, Houston.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)  

GUAM (REV 27)

01 16 52 33  CC  Apollo 9, Houston through Guam.
01 16 52 43  CDR  Roger. Houston, Apollo 9. Go.
01 16 52 45  CC  Roger. We see you have P00. Request ACCEPT.
01 16 52 49  CDR  Roger. You got ACCEPT.
01 16 52 53  CC  Roger. We'll send your state vector and your EFTSMAT up to you.
01 16 52 58  CDR  Okay.
01 16 53 01  CC  We might continue with block data when you get a chance there.
01 16 53 04  CDR  Okay. Stand by one, please.
01 16 54 55  LMP  Houston, Apollo 9.
01 16 54 57  CC  Houston. Go.
01 16 54 59  LMP  Okay. I copied up through the DELTA-V\textsubscript{C} on 030 dash 2 Charlie. Do you want to go from there?
01 16 55 07  CC  Roger. DELTA-V\textsubscript{C} on 030 dash 2 Charlie 3\textsuperscript{rd}59 031 dash 2 Charlie, plus 321, minus 0320 047 58 31 3\textsuperscript{rd}59; 032 2 Bravo, plus 253, minus 0330 049 34 33 4\textsuperscript{rd}58. And your SPS trim: pitch minus 0.9, yaw minus 0.7. Over.
01 16 55 21  LMP  Roger. Understand. I'll read them all back to you if your ready.
01 16 55 24  CC  Roger. Go.

HUNTSVILLE (REV 27)

01 16 55 28  LMP  How do you read now; you fading on me?
01 16 55 30  CC  Roger. Loud and clear.
01 16 55 34  LMP  Okay. 027 Alfa Charlie, plus 090, minus 0310 041 16 03 3589; 028 dash 2 Alfa, plus 249, minus 0264 043 03 57 3001; 029 Alfa Charlie, plus 317,
01 16 57 52    CC    Apollo 9, Houston. Your readback correct.
01 16 58 04    CC    Apollo 9, Houston. The computer is yours.
01 16 58 08    LMP   Okay. I understand. And did you copy all that?
01 16 58 11    CC    Affirmative. Your readback was correct, and I have a NAV check for you.
01 16 58 17    LMP   NAV check. Okay. Go ahead.
01 16 58 20    CC    Roger. 042 00 0000, plus 2858, plus 00646 1126. And this is 30 minutes prior to NAV update.
01 16 58 49    LMP   Roger. 042 0000, plus 2858, plus 00646 1126.
01 16 58 59    CC    Apollo 9, Houston. You readback correct.
01 16 59 02    LMP   Roger.

MERCURY (REV 27)

01 17 01 11    CC    Apollo 9, Houston.
01 17 01 50    CC    Apollo 9, Houston.
01 17 01 53    CDR   Houston, Apollo 9. Go ahead.
01 17 01 57    CC    Roger. I have a new CSM weight for your DAP data load.
01 17 02 01    CDR   Okay. Go.
01 17 02 03    CC    Roger. CSM weight 30571.
01 17 02 15    CDR   Apollo. Roger. 30571 for CSM weight.
01 17 02 19    CC    Affirmative.
01 17 09 34    CC    Apollo 9, Houston. I have your AOF star observation PAD.
(GOSS NET 1)

01 17 09 41  CDR  Okay. Stand by, please.

01 17 09 43  CC  Wilco.

01 17 10 21  SC  Okay. Houston, Apollo 9. Go with the AOT PAD.

01 17 10 24  CC  Roger. GET 043 plus 55 plus 00; AOT detent 2; NAV star, 15 Sirius. CSM gimbal angles: roll 079, pitch 358, yaw 309. Comments: earth in field of view until 43 plus 55. Over.

01 17 11 17  CDR  Okay. Copy that. At 043:55:00; AOT detent 2; NAV star, Sirius 15. Roll 079, pitch 358, yaw 309. Earth in field of view until 43 plus 55.

01 17 11 37  CC  Apollo 9, Houston. Correct.

01 17 11 40  CDR  Okay.

01 17 16 49  CDR  Houston, Apollo 9.

01 17 16 51  CC  Houston. Go.

01 17 16 53  CDR  Okay, when you sent us a REFSMAT, did you put it in the preferred location?

01 17 17 00  CC  Affirmative.

01 17 17 02  CDR  Okay. Thanks; just wanted to make sure.

01 17 17 04  CC  Roger.

01 17 18 47  CC  Apollo 9, Houston. About 1 minute to LOS. I've got some S-band antenna checks, gimbal angles, and times, if you want them.

01 17 18 57  LMP  Okay. I guess as good a time as any.

01 17 19 00  CC  Okay. The first one, GET: 44 plus 06 plus 00; pitch 188, yaw 070. GET: 44 plus 08 plus 00; pitch 169, yaw 044. GET: 44 plus 10 plus 00; pitch 159, yaw 017.

01 17 19 45  LMP  Okay. S-band 44:06, pitch 188, yaw 070; 44:08, pitch 169, yaw 044; 44:10, pitch 159, yaw 017.

01 17 20 00  CC  Roger. Correct. And Canaries at 52.
(GSS NET 1)

CANARY (REV 27)

01 17 52 08  CC  Apollo 9, Houston through Canaries.
01 17 52 11  CDR  Roger. Houston, Apollo 9. Go.
01 17 52 16  CC  I read you loud and clear. Everything looks good down here. You have a GO for IVT.
01 17 52 22  CDR  Roger. I understand a GO for IVT. Thank you. We're mashing along.
01 17 52 27  CC  Roger.
01 17 57 17  CC  Apollo 9, Houston. One minute to LOG. S-band up for Honeysuckle at 37; will try ARIA at 29.
01 17 57 57  CDR  Roger. Honeysuckle at 37 and ARIA at 29, and S-band up at Honeysuckle.
01 17 58 02  CC  Roger.
01 17 58 11  CC  Have a good day. Will see you this evening.
01 17 58 14  CDR  Okay. Thank you, Ron.
01 17 58 16  CC  Roger.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOES NET 1) Tape 28/1
Page 127

ARIA (REV 27)

01 18 31 49 CC Roger. Apollo 9, this is Houston through ARIA 1. How do you read?

HONEYSUCKLE (REV 27)

01 18 38 31 CC Apollo 9, this is Houston through Honeysuckle. Standing by.
01 18 38 45 CDR Roger. Houston, this is Apollo 9 here. Go ahead.
01 18 38 50 CC Roger. Copy. We're just standing by.
01 18 38 53 CDR Okay. We're still trying to do a P51 here. We haven't started clearing the tunnel, so we're running quite a bit late.
01 18 44 19 CC And, Apollo 9, Houston. We'll see you over Mercury in about 3 minutes.
01 18 44 25 CDR Roger.

MERCURY (REV 27)

01 18 48 03 CC Apollo 9, Houston. We've got you through Mercury.
01 18 48 05 CMP Houston, Apollo 9. Say again.
01 18 48 06 CC Roger. We've got you through the Mercury solid; have you for about another 8-1/2 minutes.
01 18 48 12 CMP Roger. We've just completed a P51 and 52, and we'll be mashing on.
01 18 48 16 CC Roger.
01 18 53 15 CMP Houston, Apollo 9.
01 18 53 18 CC Go, Apollo 9.
01 18 53 21 CMP Roger. We're going to be pretty busy here for the next few minutes. If you see us getting toward gimbal lock, let us know.
01 18 53 23 CC Roger. We'll only have contact with you for the next 3 minutes, and then our next station is Antigua at 17.
Apollo 9, this is Houston through Antigua. Standing by.

Okay, Houston. We have the tunnel clear now, and we're starting the transfer.

Roger. Copy.

Houston, the docking tunnel index angle is plus 2.1.

Roger. Copy plus 2.1. Thank you.

Houston, Apollo 9.

Go, Apollo 9.

Since we're running so far late here, you might take a look at the flight plan and see what needs to be changed. I haven't had time to do that.

Roger. We're working on that now. We can give you some recommendations later on.

Roger.

Houston, just for your info, tunnel clearing went pretty much according to plan.

Roger. I understand that tunnel clearing went real well and just for info, we're looking ahead. We're just saying press right on down the line right now, Jim, and we may just slip the docked DPS the REV.

But I think with your activity in there, you may just make up a good bit of this time.

Houston, Apollo 9.

Go, Apollo 9.

Apollo 9, Houston. Go ahead.

Houston, Apollo 9.
Go ahead, Apollo 9. Houston is reading you loud and clear.

Roger. Another little piece of info for you. The drogue looks as good as new. There was a very small pencil line about 4 inches long, and that's about all we could see on it.

Roger, Apollo 9. Copy.

This is Apollo, Houston. Apollo 9.

Go, Apollo 9.

One little problem we might advise you of here, you might think about it. On the optics on the drive - The manual drive of the optics, the shaft seems to hang up around 64 degrees when you try to drive it manually. Seems to drive okay automatically. The feedback, the readout on the LEB, the mechanical readout is frozen at 64 degrees. The numbers read 64.0, and we haven't been able to get that to move since yesterday. Once you get past the 64-degree mark, it seems to work okay.

Roger, Apollo 9. Houston copies.

Okay.

And, Apollo 9, Houston. We'd like to have you bring up your S-band volume; we'll be working Madrid.

Roger, S-band up.

Houston, Apollo 9.

Go, Apollo 9.

Okay. I've got the gyro torquing angles for the P52 if you're ready to copy.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 19 35 00</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>01 19 35 02</td>
<td>CMP</td>
<td>GET: 42:48:00, minus 01172, minus 00 099, plus 00413.</td>
</tr>
<tr>
<td>01 19 35 20</td>
<td>CC</td>
<td>Roger, Apollo 9. I copied those. Thank you.</td>
</tr>
<tr>
<td>01 19 35 24</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>01 19 37 21</td>
<td>CC</td>
<td>Okay, Apollo 9, Houston. We're going to lose you at Madrid in about a minute, and we'll see you over Carnarvon at 04.</td>
</tr>
</tbody>
</table>

END OF TAPE
APOLLO 9 AIR-TO-GROUND TRANSCRIPTION

(GOSB NET 1)

CARNAHON (REV 26)

01 20 03 25 LMP (SPIDER) Okay, how do you read on SIMPLEX A?
01 20 03 27 CMP (GUMDROP) Five-square.
01 20 03 33 LMP (SPIDER) VHF B transmitter has come - I mean VHF B transmitter is sensational.
01 20 03 40 CMP (GUMDROP) Your - Spider, this is Gumdrop. Do you read?
01 20 03 54 LMP (SPIDER) Gumdrop, Spider.
01 20 03 57 CDR (GUMDROP) Go ahead, Spider. Gumdrop here.
01 20 03 59 LMP (SPIDER) Roger. Do you want the tape off now, also?
01 20 04 00 CMP (GUMDROP) It doesn't say so. Seems like a good idea, though.
01 20 04 06 LMP (SPIDER) Yes. Tape coming off.
01 20 04 10 CC And, Spider, Gumdrop --
01 20 04 12 CDR (GUMDROP) Okay. We're configuring the CSM now for the --
01 20 04 15 LMP (SPIDER) Go ahead, Jim.
01 20 04 17 CDR (GUMDROP) -- IM data, and we want you to go to TELEMETRY LOW.
01 20 04 20 LMP (SPIDER) Roger. We're TELEMETRY LOW.
01 20 04 22 CDR (GUMDROP) VHF B transmitter to DATA and VHF B receiver OFF.
01 20 04 25 LMP (SPIDER) Roger. Got it.
01 20 04 28 CMP (GUMDROP) Okay. We've already done the antenna checks.
01 20 04 31  LMP  (SPIDER)  Just a second.
01 20 04 35  CC  Spider, this is Houston. Could you give us high bit rate, please?
01 20 04 40  LMP  (SPIDER)  Roger. Houston, Spider. High bit rate. How do you read, Houston?
01 20 04 44  CC  I read you five-square. And, Gumdrop, I'm copying you five-by-five.
01 20 04 48  LMP  (SPIDER)  Roger.
01 20 04 52  CDR  (GUMDROP)  Okay. I've got the tape off here now. Was there any noticeable difference between the antennas?
01 20 04 56  LMP  (SPIDER)  Oh, a little bit, but I had a lot of noise in the 6-band when I tried it.
01 20 05 00  CDR  (GUMDROP)  Okay. Let's just stay where we are; this is good over here.
01 20 05 03  LMP  (SPIDER)  Roger. Good here, too.
01 20 05 06  CDR  (GUMDROP)  Okay. I'm going to be coming over now, so I'll see you in a minute.
01 20 05 09  LMP  (SPIDER)  Okay. Now wait a minute. I've got to get my hose hooked up here, Jim.
01 20 05 13  CDR  (GUMDROP)  Roger.
01 20 05 17  LMP  (SPIDER)  Gumdrop?
01 20 05 18  CDR  (GUMDROP)  Go ahead.
01 20 05 19  LMP  (SPIDER)  Roger. We're going to have to transfer me onto the ECS first. First few steps there are mine, I think.
01 20 05 25  CDR  (GUMDROP)  Okay. Let me go back here and get these.
01 20 05 40  CDR  (GUMDROP)  Yes. When you get ready to transfer over, let us know; we'll turn your suit flow off.
01 20 05 46  LMP (SPIDER)  Okay. Stand by. Let me advise.
01 20 05 48  CDR (GUMDROP)  Okay.
01 20 05 52  CC  Gumdrop, Houston.
01 20 05 54  CDR (GUMDROP)  Go ahead.
01 20 05 56  CC  Roger. We're trying to do a little planning here. We'd like to have your opinion on how you're doing on the timeline. And we're looking, trying to size up whether or not you're more than an hour behind it.
01 20 06 10  CDR (GUMDROP)  Just a minute, and let me see. We're just about ready to start the CDR transfer, which is supposed to take place at 43:08, and we're at 44:06.
01 20 06 21  LMP (SPIDER)  ... to my suit, there, ... Gumdrop.
01 20 06 24  CDR (GUMDROP)  Okay. Just a minute. We'll get it off. So we're running just about an hour behind.
01 20 06 31  CC  Okay. Copied.
01 20 06 34  CDR (GUMDROP)  We haven't run into any glitches yet, so we're going right along here. Maybe we can pick up some time here in a minute.
01 20 06 41  CC  Roger. Copy.
01 20 06 45  CDR (GUMDROP)  It's okay, Rusty; suit flow coming off now.
01 20 06 47  LMP (SPIDER)  Okay.
01 20 06 58  CMP (GUMDROP)  Okay. Then the LMP's supposed to take his suit isolation valve and let his suit flow when you get plugged in?
01 20 07 16  LMP (SPIDER)  Okay ... I'm in suit flow.
01 20 07 19  CDR  You're in suit flow. Okay we'll ... the umbilical here.
(GUMDROP)

01 20 07 25  CDR  Okay, we're going to pass the ISO over to you in
(GUMDROP)  just a minute, soon as we get the --

01 20 07 31  LMP  All right.
(SPIDER)

01 20 07 32  CC  Spider, Houston. We'd like to have DFI ON when

01 20 07 39  CDR  And did you get that, Rusty? They want the
(GUMDROP)  DFI ON. And, Spider, configure the cabin with

01 20 07 52  LMP  Okay, Houston. We got the DFI ON, and be advised
(SPIDER)  we had a MASTER ALARM with DFI ON, and I don't have

01 20 08 01  CC  Roger. Copy.

01 20 08 06  CDR  Okay. And I'm going to disconnect here. I'll
(GUMDROP)  be on my way over in a minute, Rusty.

01 20 08 11  LMP  Okay. Stand by. Okay. I'm ready.
(SPIDER)

01 20 08 15  CDR  Okay. I'll put the checklist away, and I'll
(GUMDROP)  take my helmet off and be over in a minute.

01 20 10 45  CC  Spider, Houston. When you get a chance, we'd

01 20 10 55  LMP  Roger. I'll be with you in just a second.
(SPIDER)

01 20 10 59  CC  Roger. And, Gumdrop and Spider, like to ensure

01 20 11 08  CDR  ... Gumdrop.
(GUMDROP)

01 20 11 18  LMP  And, Houston, this is Spider.
(SPIDER)

01 20 11 19  CC  Go.

01 20 11 21  LMP  Roger. For your information, the SUPERCRIT
(SPIDER)  pressure is reading zero at the moment.
(GOSS NET 1)

01 20 11 28 CC Roger. Copy. We're reading 686, Spider.
01 20 11 35 LMP (SPIDER) Okay.

HONEYSUCKLE (REV 28)

01 20 12 00 CMP (GUMDROP) Houston, Gumdrop.
01 20 12 02 CC Go, Gumdrop.
01 20 12 06 CC Go ahead, Gumdrop. Houston here.
01 20 12 23 CMP (GUMDROP) Houston, Gumdrop.
01 20 12 25 CC Gumdrop, Houston. I'm reading you loud and clear. Go ahead.
01 20 12 28 CMP (GUMDROP) Okay. The noise is gone now. Would you keep an eye on the gimbal angles, please?
01 20 12 34 CC That's affirmative. We'll watch them for you. And we'll have you over Honeysuckle here for 10 minutes.
01 20 12 39 CMP (GUMDROP) Very well. Thank you.
01 20 13 32 LMP (SPIDER) Houston, Spider.
01 20 13 33 CC Go, Spider.
01 20 13 37 CC Spider, Houston. I'm reading you loud and clear.
01 20 13 47 CMP (GUMDROP) Spider, Gumdrop. He's reading you.
01 20 13 55 CC Spider, this is Houston. I'm reading you loud and clear.
01 20 14 07 CMP (GUMDROP) Spider, Gumdrop.
01 20 14 14 C? (GUMDROP) He reads you five-by.
01 20 14 32  CMP (GUMDROP)  Houston, Gumdrop. Did you copy to Spider?
01 20 14 35  CC  That's a negative, Gumdrop. Maybe you'd better relay it.
01 20 14 39  CMP (GUMDROP)  DF1 is OFF, and the R and D is OPEN.
01 20 14 44  CC  Roger. Copy.
01 20 14 52  CC  And, Gumdrop, you're 30 degrees yaw. We're watching it for you.
01 20 14 55  CMP (GUMDROP)  Okay. Thanks.
01 20 15 55  CC  And, Spider, Houston. We'd like to have R and D instrumentation circuit breaker Baker IN as soon as you can.
01 20 16 08  CMP (GUMDROP)  Spider, Gumdrop. R and D instrumentation circuit breaker Baker IN when you have a chance.
01 20 16 22  CMP (GUMDROP)  You say it is IN?
01 20 16 24  CC  Okay. Thank you, Gumdrop.
01 20 16 29  CC  And, Gumdrop, you're 40 degrees yaw. We're watching it.
01 20 16 32  CMP (GUMDROP)  Okay. Thank you.
01 20 19 37  LHF (SPIDER)  Houston, this is Spider. If you read, be advised that we got good signal strength on S-band, but we're getting some static and a steady tone.
01 20 19 47  CC  Roger, Spider. And we're reading you loud and clear now. Honeysuckle had you on a side lobe. We've got you in good voice, and we're getting data.
01 20 20 13  CDR (SPIDER)  Hello, Gumdrop. This is Spider. How do you read?
01 20 20 16  CMP (GUMDROP)  Five-square. How me?
01 20 20 17  CDR (SPIDER)  Loud and clear. Let me check a couple of the other buttons here.
(GOSS NET 1)

01 20 20 19  CMP  (GUMDROP)  Okay.

01 20 20 21  CDR  (SPIDER)  How do you read me on this one?

01 20 20 22  CMP  (GUMDROP)  Five-square.

01 20 20 23  CDR  (SPIDER)  Okay. Let me try ... check the VOX.

01 20 20 43  CDR  (SPIDER)  Hello, Gumdrop. This is Spider. How do you read?

01 20 20 47  CMP  (GUMDROP)  Sounds good.

01 20 20 48  CDR  (SPIDER)  Do you read me now, all right?

01 20 20 49  CMP  (GUMDROP)  Five-square.

01 20 20 52  CDR  (SPIDER)  That's good.

01 20 20 53  CC  And, Gumdrop, Houston. Copied all three of those.
You're coming through loud and clear, Jim.

01 20 21 07  CC  And, Gumdrop, this is Houston.

01 20 21 08  CMP  (GUMDROP)  Go.

01 20 21 09  CC  We're going to drop off with Honeysuckle, here.
You've got 60 degrees, and you've got about a tenth of a second rate.

01 20 21 26  CC  Gumdrop, Houston. You've got about 60 degrees of yaw.

MERCURY (REV 28)

01 20 23 05  CMP  (GUMDROP)  Who's in the tunnel now?

01 20 23 09  CDR  (SPIDER)  Stand by. We're going to check ...
01 20 23 12 CMP (GUMDROP) Okay.

01 20 23 17 CMP (GUMDROP) ... Spider ...

01 20 23 40 CC Spider and Gumdrop, we've got you through Mercury now.

01 20 23 50 CDR (SPIDER) Roger, Houston. Spider here. How do you read?

01 20 23 54 CC I'm reading you okay, Spider.

01 20 23 58 CDR (SPIDER) Okay. We sure had a lot of static and noise coming up on the o-band there over Carnarvon.

01 20 24 06 CDR (SPIDER) Or make that Honeysuckle.

01 20 24 09 CC Roger, Spider. We'll try to solve that. You were coming through here loud and clear after we got a main lobe lock on.

01 20 24 19 CDR (SPIDER) ... all. I had a keyhole static and a steady high tone on it.

01 20 24 26 CC Roger. Understand you had a high tone.

01 20 24 37 CC And, Gumdrop, we're showing you at 60 degrees.

01 20 24 40 CMP (GUMDROP) Roger. Thanks. I've got a hold of it now, and I think the trend looks like we'll clear it fine. Thank you.

01 20 24 47 CC Roger. Thanks.

01 20 26 29 CDR (SPIDER) And, Gumdrop to Spider.

01 20 26 31 CMP (GUMDROP) Go ahead.

01 20 26 32 CDR (SPIDER) Roger. We're ready to start reinstalling.

01 20 26 35 CMP (GUMDROP) Okay. Drogue's in.

01 20 27 25 LMP (SPIDER) Dave, I guess you don't need me for anything more in the tunnel here. I'll go ahead and close up our hatch.
I'd like for you to check the capture latches.
Okay.
I'm up here waiting for you.
Be right up.
Yes. I see your problem.
Boy, I tell you these hoses are really something.
Houston, Spider.
Go, Spider.
Roger. We're picking up an awful lot of noise
and static on the S-band again here.
Roger. Understand. Gumdrop, are you getting
it also?
Roger. Not bad.
Did you say you were not getting it bad there?
No, I'm not getting it bad; Gumdrop sounds clear.
Sounds like your standard S-band pass, Houston.
Okay. Copy that. Did you copy, Spider?
Yes ... I copied.
Okay, Davy. I'm right here.
Okay.
Okay. That looks like it did it.
Okay. I give a pull, and it feels solid.

Yes. On all three ...

Okay.

Fine. See you later; I'm going to close the door.

All righty. Have a nice time.

We will.

I'll get dinner ready when you're ready.

Man, am I hungry!

Houston, Gumdrop.

Go, Gumdrop.

How much longer do we have you here?

Okay. We're going to have you here for about another 5 minutes, and then we're coming up over Antigua at about 53. And I would like to pass to Spider, also, that we would like to try to pick up a nominal flight plan at Antigua with the secondary S-band check. We are recommending eliminating the COMM checks and whatever you have to do to pick up the flight plan at that time.

Okay, Houston. We read you. This is Spider.

Okay.

What time is that pass at Antigua?

Okay. Antigua will be at 53.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 20 31 39</td>
<td>CDR (SPIDER)</td>
<td>Roger. We'll be ready for you.</td>
</tr>
<tr>
<td>01 20 31 40</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>01 20 31 41</td>
<td>CMP (GUMDROP)</td>
<td>Gumdrop copies.</td>
</tr>
<tr>
<td>01 20 31 42</td>
<td>CC</td>
<td>And, Spider, we have no good data for that ACT star visibility check. We'll have to eliminate that, and so you could leave your rendezvous radar stowed if you want to.</td>
</tr>
<tr>
<td>01 20 32 00</td>
<td>CDR (SPIDER)</td>
<td>Roger. Understand.</td>
</tr>
<tr>
<td>01 20 32 02</td>
<td>CC</td>
<td>And we'll see you over Antigua, docking on ready.</td>
</tr>
<tr>
<td>01 20 32 09</td>
<td>CDR (SPIDER)</td>
<td>Roger.</td>
</tr>
<tr>
<td>01 20 32 12</td>
<td>CC</td>
<td>And, Gumdrop, I know with all the activity I'd like to remind you of your CO₂ cartridge change that's due at 44:10.</td>
</tr>
<tr>
<td>01 20 32 21</td>
<td>CMP (GUMDROP)</td>
<td>Roger. I'll have to get the tunnel closed up first, but I'll get it first chance.</td>
</tr>
<tr>
<td>01 20 32 25</td>
<td>CC</td>
<td>Roger. No sweat. I just wanted to pass it to you.</td>
</tr>
<tr>
<td>01 20 32 29</td>
<td>CMP (GUMDROP)</td>
<td>Okay. Thank you.</td>
</tr>
<tr>
<td>01 20 32 36</td>
<td>CC</td>
<td>Spider, this is Houston. Would you go low bit rate?</td>
</tr>
<tr>
<td>01 20 32 40</td>
<td>CDR (SPIDER)</td>
<td>Roger. Go on low bit rate.</td>
</tr>
</tbody>
</table>

**ANTIGUA (REV 29)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 20 53 51</td>
<td>CC</td>
<td>Hello, Spider. This is Houston. How do you read?</td>
</tr>
<tr>
<td>01 20 53 54</td>
<td>LMP (SPIDER)</td>
<td>You're five-square, Houston. How me?</td>
</tr>
<tr>
<td>01 20 53 56</td>
<td>CC</td>
<td>Oh, you're coming in great, Spider. How are you doing?</td>
</tr>
</tbody>
</table>
01 20 54 04  CC  And, Spider, we're standing by for the secondary S-band check at your convenience.
01 20 54 09  LMP  (SPIDER)  Roger. Power AMP going off now.
01 20 54 12  CC  Roger.
01 20 54 25  CMP  (GUMDROP)  And, Houston, Gumdrop here. The tunnel is closed off, and everything works just like it should.
01 20 54 31  CC  Roger, Gumdrop. Thank you.
01 20 54 41  CDR  (SPIDER)  And, Houston, this is Spider. How do you read?
01 20 54 45  CC  We're reading you loud and clear, Spider. We've had a data drop out here; let's hang loose and see if we can get our data check.
01 20 54 54  CDR  (SPIDER)  Roger.
01 20 55 02  CMP  (GUMDROP)  I could hear your data drop out.
01 20 55 03  CC  Very good.
01 20 55 14  CC  And, Spider, this is Houston. Could you give us high bit rate?
01 20 55 18  CDR  Roger. Going high.
01 20 55 36  CC  Okay, Spider. We'll have to hang loose here for a minute. I'm getting your VHF down. We don't have a good lock on S-band.
01 20 55 43  LMP  (SPIDER)  Roger.
01 20 55 48  CC  And while we are waiting, could you comment on if you accomplished the - With the exception of the COMM check, are you up on the flight plan now?
01 20 56 00  CDR  (SPIDER)  We got the glycol check done and a suit integrity check done. We have not accomplished a regulator check or the rest of the COMM or the daylight star visibility.
01 20 56 12  CC  Okay. We are scrubbing the daylight star visibility and the COMM check. How about your ascent batteries'
Roger. The ascent batteries checked out okay, and the pyros. You ready to copy?

Go ahead.

Roger. 36.8, 37.5 - A and B.

Roger. Copy. 36.8 and 37.5. Thank you.

Roger.

And for your information, the ascent batteries were sharing just about equally.

Roger. Understand.

And, Spider. We have got our data check. Let's go on with the secondary S-band check, step 2.

Roger. Power AMP going to SECONDARY.

Roger.

Okay. And we are on secondary transmitter/receiver. How do you read?

Roger. I'm reading you loud and clear. Let me verify that it is S-band, Spider.

Okay.

And, Spider, this is Houston. Let's go on to step 3.

Roger.

And Houston. We are back in primary primary, and be advised on the primary transmitter/receiver, I've got a squeal.

Roger. Understand you're primary primary, and there is a squeal. You're coming through loud and clear here without any static at all. Let's stand by for a data. I will give you a call.

Roger.
(GOSS NFT 1)

01 20 59 08 CC And Spider. Also, we'd like to - at your convenience get an E memory dump in here. It's a little ahead of schedule, but we'd like to get it now if you can give us a VERB 74 sometime on your Mark.

01 20 59 20 CDR (SPIDER) Roger. Stand by.

01 20 59 30 CDR (SPIDER) Okay. 3, 2, 1.

01 20 59 32 CDR (SPIDER) MARK.

01 20 59 39 CC Roger. We got your - we got your Mark. We'll stand by and see if we got it. We might have you repeat it again shortly; and let me see if we are through with this check.

01 20 59 59 CC Spider, this is Houston. We have completed the secondary S-band check.

01 21 00 04 CDR (SPIDER) Roger.

01 21 00 15 CC And, Spider. If you have still got the squeal on primary, let's go secondary on your transmitter/receiver.

01 21 00 23 CDR (SPIDER) Roger. It has gone away now. We'll see how it works.

01 21 00 27 CC Okay. Thank you.

01 21 02 07 CC Spider and Gumdrop, this is Houston. We'll have you now for another 12 minutes.

01 21 02 15 CMP (GUMDROP) Gumdrop. Roger.

01 21 02 18 CDR (SPIDER) Spider. Roger

01 21 04 46 CC Spider, Houston. We'd like to know when you are going to deploy the landing gear. We'd like to have a Mark on it and would like to get it before we lose you at Madrid in about 8 minutes, if possible.

01 21 04 59 CDR (SPIDER) Right away.
It will be pretty close to the end.

Okay. Understand.

Hey, Gumdrop, this is Spider. We're going to deploy the landing gear in a few minutes here, so you'll probably feel a big bang.

Sounds good.

Roger.

You might stand back and give me a minute, will you?

Gumdrop and Spider. Insure S-band volume up. We'll be going over to Madrid shortly.

Okay. How long do we have before you want the gear down?

We're ready any time.

How long do we have?

Okay. You've got about another 5 minutes before we'll lose you at Madrid.

Okay.

And, Spider. For your info we - DPI, we cannot read at Madrid, so we've only got about another minute here on Canaries to monitor that gear.

Okay, Dave. We'll do it very quickly.

Okay.

Okay.
(GOSS NET 1) Tape 29/16
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01 21 10 53 CDR (SPIDER) Okay. Houston, this is Spider. You ready?

01 21 11 03 CC We're ready.

01 21 11 06 CDR (SPIDER) Houston, Spider. Do you read?

01 21 11 09 CC Spider, this is Houston. Read you loud and clear. We are ready. Go ahead and deploy the gear.

01 21 11 16 CDR (SPIDER) 3, 2, 1.

01 21 11 18 CDR (SPIDER) MARK.

01 21 11 26 CMP (GUMDROP) Spider, Gumdrop.

MADRID (REV 29)

01 21 11 27 CDR (SPIDER) Dave, ... I've got ...

01 21 11 44 CMP (GUMDROP) Spider, Gumdrop. Okay. I think they copied you. They were listening when you said 3, 2, 1; then I got a break lock ...

01 21 11 53 CC Gumdrop -

01 21 11 56 CMP (GUMDROP) We've got one out here too, boy ...

01 21 11 56 CC Gumdrop and Spider, we copied you. We heard talk back gray, and you got a visual on the gear.

01 21 12 31 CMP (GUMDROP) By the way, can you see me out your overhead window? Go ahead, don't let me bother you.

01 21 12 54 CC Spider, this is Houston. Could you give us low bit rate?

01 21 12 56 IMP (SPIDER) Roger. Going low bit rate, and we are going to CAL right now.

01 21 12 55 CC Roger. Understand. We will see you over Carnarvon at 39.
(GOSS NET 1)  

01 21 13 04  CDR  Okay. Did you get that gear extension, Houston?
(SPIDER)  

01 21 13 07  CC  That's affirmative, Spider. It came through loud and clear. We are showing the relay closed, and I copied all your transmissions.

01 21 13 14  CDR  Thanks, Dave.
(SPIDER)  

01 21 13 15  CMP  Roger.
(GUMDROP)  

01 21 13 24  CC  Gumdrop, this is Houston. Could you give us your up-telemetry switch, your command to RESET and back to FORMAL?

01 21 13 42  CC  Gumdrop, Houston. Could you give us RESET, back to FORMAL on your command reset?

01 21 14 16  CC  And we will see you at Carnarvon at 39, Gumdrop and Spider.

END OF TAPE
Hello, Gumdrop and Spider. This is Houston through Carnarvon.

Roger. Go.

... I would like to go private with you.

You cut each other out there. Say again, please.

I'll get it, Dave. Houston, this is Spider. I would like to go private with you, please.

Roger. Understand. Will do.

Okay, Spider. It will be a couple of minutes here.

Okay.

Spider, this is Houston. Do you read?

Roger. I read you.

Okay. We're all configured for a private talk, Jim.

Hello, Houston. This is...

Hello, Spider. Did you call? This is Houston.

Gumdrop, this is Houston. How do you read through Honeysuckle?

Roger, Houston. You're five-by.

Roger. I believe Spider called. We may be having S-band troubles with him again. Can you read me, Spider?
(GOSS NET 1)

Tape 30/2
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01 21 53 40 CMP (GUMDROP) Spider, Gumdrop. Could you try and call Houston? They're reading you.

01 21 53 44 CDR (SPIDER) No, I'm not reading Houston at all. Roger, I just wanted to tell them that we're going to try to complete that TV pass over Houston with the PLSS. And at that time, we're going to try taking the PLSS apart, and that will be the end of the OMM check.

01 21 53 59 CC Spider, this is Houston. I copy that, and what I'm recommending is that we configure for that mode 10 over Mercury. We will have about an 11-minute pass over Mercury, and we will get all set up then, and then we will be ready to go when we come into the States.

01 21 54 25 CMP (GUMDROP) Okay. Spider, Gumdrop. What he wants you to do is - He understood that you said. He would like for you to configure for the mode 10 over Mercury so you can get all set up to get about an 11-minute pass here.

01 21 54 41 CC Gumdrop, this is Houston. If they will not be ready for that, it's no problem. We've still got you here at Honeysuckle for about 5 minutes. We will have you at Mercury for 11.

01 21 54 52 CMP (GUMDROP) Okay. He got it, Houston. He said "Roger," and I assume they'll be able to do that for you.

01 21 54 56 CC Okay. Very good.

MERCURY (REV 29)

01 22 01 58 CC Hello, Spider. This is Houston. Could you give a high bit rate, please?

01 22 02 07 CMP (GUMDROP) Spider, Houston wants high bit rate.

01 22 02 26 CC Gumdrop, Houston. Did he copy you?

01 22 02 29 CMP (GUMDROP) Roger. He said he'd get it in just a minute.

01 22 02 31 CC Okay. Evidently, I'm not getting anything out of him. I'll check the site.
(GOSS NET 1)  

01 22 02 36  CHP  (GUMDROP)  Okay.

01 22 02 39  CDR  (SPIDER)  This is Spider.

01 22 02 46  CHP  (GUMDROP)  Houston, Gumdrop. Spider says he's reading you five-by now.

01 22 02 50  CC  Roger. Understand. Spider, can you give me a transmission? How do you read me?

01 22 02 55  CDR  (SPIDER)  I'm reading you loud and clear. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.

01 22 02 59  CC  Okay. I'm reading you real good. We've got 8 minutes in this pass, and if you'd like to get set up for the LM two-way relay and adjust your VOX and so forth, I can give you a count any time you want it and get yours. Let me know when you are going to that configuration.

01 22 03 30  CDR  (SPIDER)  Roger, Houston. We'll be with you in a minute. Stand by.

01 22 03 34  CC  Roger. Standing by.

01 22 04 14  CDR  (SPIDER)  And, Houston, we're going FM now.

01 22 04 16  CC  Roger. Go on FM.

01 22 04 28  CC  And, Gumdrop and Spider, be advised I'm going to go to our test configuration, which will be LM B-band only back to Houston. And, Mercury M and O, this is Houston CAP COB4. Would you inhibit my VHF uplink and remote LM B-band only.

01 22 05 07  CC  And, Spider, this is Houston. If you read, could you give me antenna number 2, B-band antenna number 2?

01 22 05 19  CDR  (SPIDER)  Roger. You've got 2. Do you want 1?

01 22 05 22  CC  Negative. Leave it in 2 right now, and I'm reading you okay.

01 22 05 26  CDR  (SPIDER)  Okay. Roger. That's what you had all along.
(GOSS NET 1)

01 22 05 29 CC Okay.

01 22 05 49 CMF (GUMDROP) Why don't you go ahead and do it?

01 22 05 59 CDR (SPIDER) ...

01 22 06 03 CMF (GUMDROP) Take it off; what the hell.

01 22 06 17 LMF (SPIDER) How'd you hear me?

01 22 06 18 CC Okay, Spider. I got just the last part of that. How about a short count?

01 22 06 25 LMF (SPIDER) Were we active there?

01 22 06 30 CC Okay, Spider. It's breaking --

01 22 06 33 LMF (SPIDER) It's in one?

01 22 06 44 CDR (SPIDER) ... COMM SC audio close.

01 22 06 47 CDR (SPIDER) Roger. Just a minute.

01 22 06 58 CDR (SPIDER) Unstowed.

01 22 07 04 CDR (SPIDER) Audio for the LMF side. S-band and TI. ICS OFF. Relay ON. ... outside RCS transmitter.

01 22 07 19 CMF (GUMDROP) RCS transmitter.

01 22 07 20 CDR (SPIDER) Just VOX to about 8.

01 22 07 21 CMF (GUMDROP) VOX to about 8.

01 22 07 26 CDR (SPIDER) EF 8 a TR.

01 22 07 27 CMF (GUMDROP) A to TR.
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(ROSS NET 1)  

01 22 07 30  

CDR  
(SPIDER)  

B OFF.  

01 22 07 32  

CMP  
(GUMDROP)  

B OFF.  

01 22 07 35  

CDR  
(SPIDER)  

HF 8 scratched. Adjusted at CDR to hear GUM.  

01 22 07 41  

CDR  
(SPIDER)  

Gumdrop, Spider here. Give me a short count.  

01 22 07 44  

CMP  
(GUMDROP)  

Roger. Gumdrop. 1, 2, 3, 5; 5, 4, 3, 2, 1. 
Gumdrop out.  

01 22 07 51  

CDR  
(SPIDER)  

Roger. Fine. That was good. Thank you.  

01 22 07 52  

CMP  
(GUMDROP)  

Say it again; you're broken to me.  

01 22 07 55  

CDR  
(SPIDER)  

Roger. I'm on VOX now. I said that was good. 
And, Gumdrop, we're configuring for the TV mode, 
which is mode 10.  

01 22 08 16  

CMP  
(GUMDROP)  

I'm not hearing you at all, Jim.  

01 22 08 22  

CDR  
(SPIDER)  

Gumdrop, this is Spider. Do you read me?  

01 22 08 26  

CMP  
(GUMDROP)  

Do you have your audio on?  

01 22 08 35  

CC  
  
Gumdrop, did you hear Spider? He's calling.  

01 22 08 36  

CDR  
(SPIDER)  

Gumdrop, Spider. Do you read?  

01 22 08 45  

CC  

Spider, this is Houston. How do you read?  

01 22 08 57  

CDR  
(SPIDER)  

Roger, Gumdrop. This is Spider. How do you read?  

01 22 09 01  

CMP  
(GUMDROP)  

Okay ...  

01 22 09 03  

CDR  
(SPIDER)  

Roger. We're configuring mode 15 COMM, which is 
the TV EMU relay.  

01 22 09 09  

CMP  
(GUMDROP)  

Roger. ...
Okay. Very good.

Okay, Spider and Gumdrop. It's about a minute and a half to LOS here at Mercury. Your acquisition time at Texas is 25.

There's our trouble.

Spider, this is Houston. Do you read? If you do, we are going to lose you in about a minute. Your acquisition time at Texas is 25.

Okay. It will be 25, and then we'll have about 2 minutes at the MIN before the TV pass starts.

Roger.

And, Spider, could you give us low bit rate?

And, Spider, this is Houston. We'd like - We'd like to have low bit rate and data on VHF B until we get you.

Apollo 9, Houston. Excuse me - Spider and Gumdrop, this is Houston. How do you read through Texas?

Spider, this is Houston through Texas. How do you read?

Okay, Spider. This is Houston. Do I have you?

Spider, this is Houston. Do you read?

... acquisition by now, shouldn't we?

Hello, Spider. This is Houston. Do you read?

Spider, this is Houston. If you read, you can go ahead and put in your TV circuit breaker. We are going to be handing over to Mila in about 20 seconds.
MILA (REV 30)

01 22 27 20 CC Hello, Spider. This is Houston. How do you read?
01 22 27 24 CDR (SPIDER) Roger, Houston. This is Spider. Loud and clear.
01 22 27 26 CC Roger. You are loud and clear here. Now we have you in Mila AOS. You can start your TV pass.
01 22 28 18 CC Beautiful, Spider. We've got a picture now.
01 22 28 26 CC And, Spider, this is Houston. If you read me, could you give us high bit rate?
01 22 28 49 CC And you - And the picture is coming through good, Spider. We are copying it. We've got a good view of Rusty and the PLSS.
01 22 29 10 CC Okay. Rusty, if you read me, how about raising your left arm there? Very good. We can see you; coming in real good.
01 22 29 39 CC Well, we just went through a little snow storm there, Spider, but it looks like it might come back in.
01 22 29 48 CC Okay, the blizzard is gone, and you are back real sharp now. We've got good detail.
01 22 30 00 CC And, Spider, like I say, we are getting a good picture; we're getting no voice at all.
01 22 30 12 CC And I can see you talking there, Jim. Too bad I can't read your lips.
01 22 30 35 CC Okay. Why don't you just go VHF if you can, Spider?
01 22 30 41 CDR (SPIDER) Roger. How do you read me right now?
01 22 30 42 CC We're reading you loud and clear, Spider.
01 22 30 45 CDR (SPIDER) Okay. I guess we're just not getting out, like a VOX or something. Gumdrop is reading me all right, but you aren't.
CC 01 22 30 52  Okay. I'm not reading Gumdrop at all, and I am reading you loud and clear now. And the TV picture has been real good.

SPIDER CDR 01 22 30 59  Okay. We are going to have the LMP talking into the PLSS COMM.

SPIDER LMP 01 22 31 04  Okay. How do you read now, Houston?

CC 01 22 31 07  PLSS? You are coming through loud and clear, Rusty. It's real good.

SPIDER LMP 01 22 31 12  Okay. We have to go to PTC on the hand controller to do it. Evidently, ICS won't do it.

CC 01 22 31 20  Roger. Copy. It's coming through real good now. We've got just a little under 3 minutes in the pass.

CC 01 22 31 37  And, Rusty, if you --

SPIDER CDR 01 22 31 46  Houston, this is Spider. Say again.

SPIDER CC 01 22 31 50  Roger. If it's real convenient, we would like to have position 5 on the PLSS. But don't sweat it if you can't give us that.

SPIDER CDR 01 22 32 00  ...}

CC 01 22 32 09  Okay. We had a loud squeal in there. I've got you back again now. The request was - If it's real convenient, we would like to have position 5 on the PLSS.

CC 01 22 32 49  Okay. Jim, could we have a couple of words on - of wisdom to go along with the TV show?

CC 01 22 33 16  Okay. We are not receiving you. Rusty, how about you trying it again? Maybe we can pick you up.

CC 01 22 34 03  Okay, Spider. This is Houston. That's the end of the Aila pass. If you read me, you can go back to COMM basic at your convenience and press ahead with the flight plan.

SPIDER CDR 01 22 34 21  We're reconfiguring the PLSS right now and its COMM, and we're going to end the COMM checks here. And we will get them some other time.
01 22 34 27 CC Roger. Understand. And that transmission came through loud and clear, and we will be standing by.

BERMUDA (REV 30)

01 22 35 25 CDR Houston, Spider.

01 22 35 28 CC Go ahead, Spider. Houston reading you loud and clear.

01 22 35 31 CDR Roger, Houston. We're reconfiguring to basic COIN, and we're going to mush on and prepare for all the systems here.

01 22 35 38 CC Roger. We will be standing by.

01 22 35 40 CDR Roger.

01 22 35 52 CDR And, Gumdrop, did you read that?

01 22 35 55 CMP Negative. I'm not copying Houston at all.

01 22 36 02 CDR Roger. We're configuring, and we are going to press on with the systems.

01 22 36 02 CDR Okay. Understand.

01 22 36 07 CC And, Gumdrop, this is Houston. I've got you now.

01 22 36 10 CMP Roger. Houston, Gumdrop. You are five-by.

01 22 36 12 CC Very good.

01 22 38 07 CC Gumdrop, Houston.

01 22 38 09 CMP Houston, Gumdrop.

01 22 38 11 CC Roger. We would like to terminate the charge on battery A.

And, Gumdrop, Houston. We put in 13 AMP-hours. You are right back up at 40.

Roger. Thank you. Very nice.

Okay. Gumdrop and Spider. We're going to lose you in about a minute and a half here, and we'll see you over Carnarvon at 16.

Spider, this is Houston. If you read, give us low bit rate.

Roger. Low bit rate.

Okay. We'll see you at 16 over Carnarvon.

Roger.

END OF TAPE
01 23 11 18 CDR (SPIDER) Ready.
01 23 14 24 CMP (GUMDROP) 64 00308.
01 23 14 32 CDR (SPIDER) All right. That was a little fast, but 35128 06864 00308.
01 23 14 41 CMP (GUMDROP) Roger. You got it.
01 23 14 42 CDR (SPIDER) Thank you.
01 23 14 46 CDR (SPIDER) Dave, are your rates slow?
01 23 14 50 CMP (GUMDROP) Holy Christmas! What a bunch of gyros I've got over here!
01 23 15 00 CC And, Spider, this is Houston. We'd like to have high bit rate.
01 23 15 05 CDR (SPIDER) Houston, this is Spider. Go again.
01 23 15 08 CC Roger. We'd like to have high bit rate.
01 23 15 11 CDR (SPIDER) High bit rate. Roger.
01 23 15 25 CDR (SPIDER) Gumdrops, Spider. Every one of my gyros is indicating about 3/10 of a degree per second.
01 23 15 32 CMP (GUMDROP) Is that right? My roll is 0, pitch 0, yaw 0.
01 23 15 36 LMP (SPIDER) Great!
01 23 17 11 CC And, Gumdrops, I haven't heard from you on this one. And, Spider, I've got a couple of items to pass to you when you have a chance.
01 23 17 22 CDR (SPIDER) Spider here. Go ahead.
01 23 17 24  CC  Roger. I've got a couple of addresses that's 
got to be changed as a result of the 3-day 
slip in the launch date, and when you are ready 
to copy, I'll give them to you.

01 23 17 39  CDR  Okay. Before you give us those, be advised that we 
have got a cockpit error here and we loaded - 
in starting up the FGNCS, we loaded location 30 000 
with 2176 and we would like to know what we should 
put back into 30 000.

01 23 18 00  CC  Roger. Stand by. In work.

01 23 18 04  CDR  If you want a reference on that, it's system 36,
step 1.

01 23 18 11  CC  Roger. Copy.

01 23 18 14  CMP  And the Gumdrop's with you, Houston.

01 23 18 17  CC  Roger, Gumdrop.

01 23 18 53  CC  And, Gumdrop, this is Houston. At your convenience, 
you might drag out your block data pad. I have 
block data 6 to give you as we get along here. I 
have the PAD now.

01 23 19 06  CMP  ... 

01 23 19 10  CDR  And, Gumdrop, this is Spider. So you can get out 
of your narrow deadband hold there, we will take 
an 0620 on your Mark.

01 23 19 19  CMP  Okay. Stand by.

01 23 19 26  CMP  Roger. Spider, Gumdrop. 3, 2, 1.

01 23 19 30  CMP  MARK.

01 23 19 35  CDR  Okay. Ready to copy your angles, and you can go 
to DRIFT.

01 23 19 38  CMP  Thank you. 35168 06888 00282.

01 23 19 56  CDR  Roger. Houston and Gumdrop, readback here from 
the Spider: 35168 06888 00282.
01 23 20 10  CC  Roger, Spider. I have that. I'm reading back Gumdrop's as plus 35168 06888 00282; I'm reading yours as 31148 24879 35990.

01 23 20 35  CDR  (SPIDER)  That's a verify, and the docking ring angle was plus 2.10 degrees.

01 23 20 41  CC  Roger. Plus 2.1.

01 23 20 46  CDR  (SPIDER)  Roger. And Spider ready to copy your updates.

01 23 20 52  CC  Okay. These addresses, if you are - if this unit W were the North Pole's - and your first address is 1714. What we want to load in there is 11143. The next address is 1716. We would like to load 30341. Now there were a couple of updates needed in the TFM, but you will pick those up as you go through that step. These are the only two that we would like to have you load.

01 23 21 31  CDR  (SPIDER)  Roger. Be advised we already loaded TFM. Do you want us to read that down to you?

01 23 21 38  CC  Yes. Let's have it to verify.

01 23 21 42  CDR  (SPIDER)  Okay. Ready to copy?

01 23 21 43  CC  Go ahead.

01 23 21 45  CDR  (SPIDER)  Okay. Four balls 7 35016 31153.

01 23 21 52  CC  Roger. That's verified.

01 23 21 55  CDR  (SPIDER)  Okay. And we will be using these right now.

01 23 21 57  CC  Okay. Very good.

01 23 22 20  CMP  (GUMDROP)  Houston, Gumdrop. I'm all ready for the block update.

01 23 22 24  CC  Roger. Stand by just one if you can, Gumdrop.

01 23 22 29  CMP  (GUMDROP)  All righty.

01 23 22 40  CC  Spider, Houston.
01232243  CDR  (SPIDER)  Go.
01232244  CC  Roger. We would like to know if you got an operator error when you hit ENTER on that 30 000 address.
01232251  CDR  (SPIDER)  That's a negative.
01232254  CC  Roger. Copy. No operator error.
01232257  CDR  (SPIDER)  Not that I noticed, anyway.
01232259  CC  Okay.
01232304  CDR  (SPIDER)  Let me put it this way. If there was an operator error, it disappeared by itself when I loaded the date, because I did not key a RESET.
01232313  CC  Roger. Copy.
01232334  CDR  (SPIDER)  Gumdrop, Spider. We would like to insure that the rates are less than 1/10 of a degree per second, and you won't be firing any jets for the next minute or so.
01232343  CMP  (GUMDROP)  Okay. You are all set.
01232344  CDR  (SPIDER)  Roger. Thank you.
01232440  CC  Okay. Gumdrop, this is Houston. I would like to get started on this block data.
01232445  CMP  (GUMDROP)  Roger. Go.
01232447  CC  Roger. 033 1 Alfa, plus 297, minus 0621 051 0432 3870, and I would like to have both vehicles insure S-band volume up. 034 4 Alfa, plus 325, minus 1579 053 58 60 3858; 035 4 Alfa, plus 337, minus 1579 055 29 08 3857; 036 3 Alfa, plus 292, plus 1450 056 53 16 4639. Like to verify you are with me, Gumdrop. We didn't lose you over in the handover?
I'm with you. I dropped about four bits, there, but go ahead.

Okay. 037 4 Alfa, plus 244, plus 1619 058 39 31 4574; 038 3 Baker, plus 300, plus 1500 060 02 28 4918, and for your SPS trim angles, through your first three — through 39 dash 4 Alfa: your pitch is minus 0.88, yaw is minus 0.60. Through the rest of them: your pitch is minus 0.93, yaw is minus 1.21. End of update.

Roger. Okay. I dropped one bit on the seconds of 34 1/4 Alfa. And the next area, I dropped the first three lines, and the rest of it I've got. So how about giving me those that I dropped?

Okay. The second line in 34 1/4 Alfa is plus 305, the first three lines in the next one, 035 4 Alfa, plus 337, minus 1/70; and I'd like for you to hold the readback for a little bit. And Spider, I have your IM torquing angles.

Roger. Stand by just one.

Roger.

Roger. This is Gumdrop. Give me the seconds on the time of 34 1/4 Alfa.

Oh, I'm sorry. I thought you said the second line. Okay. The second: 09; the time: 093:58:09.

Roger. 09. And I'll read it back whenever you're ready.

Okay.

Houston, this is Spider. Ready to copy the angle:

Okay. Reading the torquing angles: plus 00 910, minus 00 150, plus 01 210.

Roger. Reading back: plus 00 910, minus 00 150, plus 01 210.

That's affirmative. We've got you.
01 23 29 37 LMP (SPIDER) Thank you.
01 23 29 46 CC Spider, Houston.
01 23 29 49 LMP (SPIDER) Roger. Go ahead.
01 23 29 50 CC Roger. And on this 30 030 bit, evidently the computer dropped a 3 and loaded addresses all zeros, and there is no action required on your part.
01 23 30 03 LMP (SPIDER) That's fortunate. Thank you.
01 23 30 05 CC Roger.
01 23 30 51 CC Spider and Gumdrop, on the last two dumps of the DSE we have received no LM data. Would like to have you check your cockpit configurations to receive the LM data, and also for Spider to send it.
01 23 31 10 CMP (GUMDROP) Roger. Gumdrop's configured.
01 23 31 26 LMP (SPIDER) Gumdrop, Spider. What was that last call? We've got a lot of noise on the S-band.
01 23 31 31 CMP (GUMDROP) Roger. On the last two passes on the DSE they have not received any LM data on the dump.
01 23 31 42 LMP (SPIDER) Roger. We're configured for data here.
01 23 31 47 CMP (GUMDROP) Okay. ...
01 23 32 12 CMP (GUMDROP) Houston, Gumdrop.
01 23 32 18 CC Go, Gumdrop.
01 23 32 20 CMP (GUMDROP) Roger. I don't see the tape recorder running at this time.
01 23 32 29 CC Stand by, Gumdrop.
01 23 32 37  CC  Gumdrop, this is Houston. Could you verify your tape recorder switch is in the RECORD position?

01 23 32 43  CMP (GUMDROP)  That's verified.

01 23 32 45  CC  Okay. Thank you.

01 23 33 03  LMP (SPIDER)  Houston, this is Spider.

01 23 33 05  CC  Go, Spider.

01 23 33 08  CC  Spider, this is Houston. Go ahead.

01 23 33 11  LMP (SPIDER)  Gumdrop, is he reading us?

01 23 33 13  CMP (GUMDROP)  Roger. He's reading you. Go ahead.

01 23 33 15  LMP (SPIDER)  Okay. I'll have to transmit in the blind. Be advised we're beginning the RCS pressurization on system B, and on the second step we have an interesting result there. When I recycled system A, ascent feed 2 to CLOSE, both barber poles jumped to J, ascent feed 1 went back to barber pole immediately, and ascent feed 2 waited for about 20 seconds and then went back to barber pole; and that's happened twice in a row.

01 23 33 54  CC  Roger. Copy. Stand by on that one.

01 23 34 00  CMP (GUMDROP)  He got you, Spider.

01 23 34 04  LMP (SPIDER)  Okay. If you have any recommendation - I'm going to try in system B. If he had any recommendations let me know.

01 23 34 09  CMP (GUMDROP)  Okay.

01 23 34 10  CC  All right. We sure will; we're messaging that now, Spider.

01 23 34 15  CMP (GUMDROP)  Spider, Gumdrop. They are working it over.

01 23 34 30  CC  Spider, Houston.

01 23 34 36  CMP (GUMDROP)  Houston, Gumdrop. I don't believe he's reading. I can relay for you.
Okay. We're about to lose you here at Honeysuck. We'll see you over Mercury about 37, in about 3 minutes, and we'll clean it up there.

Very well; Mercury at 37.

Gumdrop, if you still read me, why don't you start the readback of that block data here until we go over the hill.

Roger. Let's give it a go.

Okay. 033 1 Alfa - Oh, I'm losing you now, Houston.

Okay. Roger. And you might advise him that system A ... appear to be normal now. It looks like we might have had a sticky barber pole on ascent feed 2.

We copied that, Spider. We concur.

Okay.

Okay, Spider and Gumdrop. We should have you through Mercury.

Roger, Houston. Here's the Gumdrop.

You have Spider here, Houston.

Roger. We're showing your RCS pressurized, and we're also requesting you check the address 145 and verify that it is 62045, and the reason why I'm calling you on this is, back on systems 41 when you loaded 1456, we believe it also change 1457.

Okay. Let's - The address is 1457. What is the number supposed to be now?

Should be 62045.
Roger. 1457 should be 62045.

That's affirmative.

Roger. Houston, You might check 1453 and 1455, also. My understanding was that those are double precisions for the FIPA bias, and that's why we loaded zeros in all three of those.

Roger. Copy, Spider. In work.

Okay.

Houston, this is Spider.

Co, Spider.

1457 is all balls.

Okay. We'd like to have you load 62045.

Okay. Then probably 3 and 5 will also be wrong. I'll load this one up right now.

Okay. We'll get back with you on that. We're going to have you over the Mercury here for about 7-1/2 minutes left, and I'd like to pass you your gimbal angles so we'll be all rocking on ready for your gimbal drive check when we hit Guaymas.

Roger. Stand by just one.

Roger. Go ahead.

Roger. Your GJA angles: R1, plus 00588; and R2, plus 00679.

Roger. Plus 00588, plus 00679.

That's affirmative; and stand by. I'll have you what you need in address 1453 and 55.

Roger. Do you have LM and CSM weights, by the way?
Stand by one, Spider.

Spider, Houston.

Roger. Go.

All right. Your LM weight: 32418, and that's also for Gumdrop if he wants it. CSM 30 127.

Roger. 32 418 and 30 127.

That's affirmative, Spider.

Roger. How much time do we have in this pass?

Roger, Spider. We've still got about 5 minutes left in this pass.

Okay. I'd like – Some of the systems guys might have noticed a little anomaly there at the end of the RCS pressurization on step 6.

Okay.

Make it step 5, I beg your pardon. I inadvertently placed system A ascent feed 2 momentarily to OPE instead of CLOSE, thereby opening the intercome. I closed it immediately, and I see no change in system pressures; however, it's probably an anomaly and in the data there you might note, and I'd like to know if there is any further action required.

Roger, Spider. Houston copies. And we anticipate no problems. And I have your loads for 1453 and

Roger. Ready to copy.

1453: 60066. 1455: 60462.

Roger. Let me read all of those. 53, 55, and 5 equal 60066, 60462, 62045.

That is affirmative, Spider; Houston confirms.

Roger. We'll load them now.
Okay. And, Gumdrop, let's go ahead with your readback, starting right from the first line.

Gumdrop, Houston. Standing by for your readback.

Houston, Gumdrop.

Roger. I'm ready for your readback.

Okay. Sorry, I must have lost you there for a minute. Okay, here we go: 033 1 Alfa, plus 297, minus 0621 051 04 32 3870; 034 4 Alfa, plus 325, minus 1579 053 58 09 3858; 035 4 Alfa, plus 337, minus 1579 055 29 08 3857; 036 3 Alfa, plus 292, plus 1450 056 53 16 4638; 037 4 Alfa, plus 244, minus 1619 058 39 31 4574; 038 3 Bravo, plus 320, plus 1500 060 02 28 4618. You with me that far?

I've got it all, and everything's good.

Okay. And the pitch trim and yaw trim for 33 1 Alfa through 35 4 Alfa: pitch is minus 0.88, yaw minus 0.60. For 36 3 Alfa through 38 3 Bravo: pitch minus 0.93, yaw minus 1.21.

Roger. Good show, Gumdrop. And we're gonna lose both of you in about 1 minute. We'll see you over Guaymas at about 57, and we'll be rocking on ready for you, Spider.

Roger. What time will we be at Guaymas?

Roger. It'll be Guaymas at 57, and we'd like to have low bit rate at this time.

REDSTONE (REV 30)

Hello, Spider and Gumdrop. This is Houston through the Redstone.

Loud and clear, Houston. Gumdrop.
I (C_SS 1) T_i x 31;12
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01 23 53 27 CC Roger. And to get a leg up on this Guaymas pass, I have a NAV check I'd like to give to you now, and we'll be uplinking state vectors to both vehicles over Guaymas, sometime in the States pass.

01 23 54 08 CC Okay, Spider. Are you ready, Gumdrop? I'll be ready to send you a NAV check when you're ready to copy.

01 23 54 22 CMP (GUMDROP) Ready for NAV check.

01 23 54 39 CMP (GUMDROP) Gumdrop's ready.

01 23 54 41 CC Roger, Gumdrop. I'll give it to you. Are you ready, Spider?

01 23 54 46 CDR (SPIDER) Roger. Spider ready.

01 23 54 47 CC All right. Reading the NAV check: 049 11 3340, minus 2216, plus 16516 2309. End of NAV check.

01 23 55 17 CMP (GUMDROP) Roger. Say the time again, please.

01 23 55 19 CC Roger. Reading the time: 049 11 3340.

01 23 55 33 CDR (SPIDER) Say, Gumdrop. I got 3340; is that right, Gumdrop?

01 23 55 39 CC That's affirmative, Spider; this is Houston.

01 23 55 42 CDR (SPIDER) Okay. I'll read it back to you: 049 11 3340, minus 2216, plus 16516 2309.

01 23 55 54 CC Your readback is correct, Spider; and Gumdrop, did you verify?

01 23 56 02 CMP (GUMDROP) Gumdrop verifies.

01 23 56 04 CC Roger. And while I've got you in a writing mood - I've got about a minute and a half; I'd like to give you the dock DFS MAD.

01 23 56 13 CDR (SPIDER) Roger. You should be advised that you are not coming through too good here to Spider; I'm not sure why, but you are breaking up pretty badly.
Roger. We're going to lose you in about a minute, and then we'll just catch you over Guaymas.

Roger. Gumdrop copied you. You'll get us over Guaymas. You get that, Spider?

Roger. I heard you. Understand he's going to get us over Guaymas.

That's affirm.

And, Gumdrop and Spider, if you read, we are GO for a 48 dash 1.

Roger. Understand. GO for a 48 dash 1.

That is affirmative.

Did you get that, Spider?

Got it.

Okay.

We'll stay docked with you.

Oh, very well.

And, Gumdrop, we've got you now at Guaymas. We'd like to have POO in ACCEPT for your uplink.

Roger. Gumdrop. You've got POO and ACCEPT.

Roger. Copy.

And, Gumdrop, you'll be receiving a vector in both slots.

Roger. Understand.
Spider, could you give us high bit rate, please?

Roger. You got high bit rate?

Roger. Copy.

And, Houston, this is Spider.

Go ahead, Spider.

Roger. We are ready to go on the gimbal drive any time.

Roger. We are standing by to support you. You can let her rip.

Roger. Here we go - 3, 2, 1.

MARK.

And are you ready?

You faded out, Spider. Say again.

Roger. The gimbal is driving.

Houston, Gumdrop. Spider says the gimbal is driving.

Roger. Copy. And, Gumdrop, the computer is yours.

Roger. Understand you copy, and I got the computer.

Houston, do you read Gumdrop or Spider?

Reading you loud and clear, Spider.

Here we have the CGA PCGA light on at this time, and are you ready to support the throttle test?

Spider, you are GO for the throttle test.

Roger. LMP throttle is idle. We are now at the soft-stop.
02 00 00 51 CC Roger. Copy.
02 00 00 52 LMP Okay. Full throttle point end back to IDLE.
02 00 01 05 CDR Okay, Houston. Commander's throttle is in IDLE.
(SPIDER) Now soft-stop - maximum - back down to the soft-
02 00 01 18 CC stop and IDLE.
02 00 01 18 CC Roger, Spider.
02 00 01 58 CC Okay. Houston, this is Spider. We are standing
02 00 02 10 CC by for your verification on the GDA angle.
02 00 02 10 CC Spider, this is Houston. You are GO on the gimbal
02 00 02 14 LMP drive angles.
(SPIDER) Roger. Stand by for hot fire.
02 00 02 17 CC Roger. We are standing by.
02 00 02 22 CC We are standing by to support your hot fire,
02 00 02 22 CC Spider. We are ready.
02 00 02 25 LMP Houston, we are ready to go.
(SPIDER) 02 00 02 28 CC Let her rip, Spider.
02 00 02 29 LMP Okay. A couple more switches.
(SPIDER) 02 00 03 16 LMP Okay, Houston. Spider here. We will start the
(SPIDER) proportionalized check, both fire.
02 00 03 22 CC Roger. Understand. And we are ready to go.
02 00 03 25 LMP Roger.
(SPIDER) 02 00 03 50 LMP Okay. That's complete.
(SPIDER) 02 00 03 54 CC Roger.
02 00 04 04 CDR Gumdrop, we are about to fire our jets here so you
(SPIDER) want to be in FIRE.
(GOES WEST)

02 00 04 08

CMF
(CHIMDROPO

Roger. FREE standing by.

02 00 04 10

CDR
(SPIDER)

Roger.

02 00 04 12

CMF
(CHIMDROPO

How are you with respect to gimbal lock?

02 00 04 15

CDR
(SPIDER)

Oh, about 15 - 20 degrees.

02 00 04 18

CMF
(CHIMDROPO

Okay. keep an eyeball on it.

02 00 04 19

CDR
(SPIDER)

Okay. I will be right with you.

02 00 04 31

LMP
(SPIDER)

You told us to take the hot fire now.

02 00 04 32

CC

We're ready to go. PRESS.

02 00 04 35

LMP
(SPIDER)

Roger.

02 00 04 55

LMP
(SPIDER)

Okay, Houston. It's complete.

02 00 04 48

CC

Roger. Copy.

02 00 05 01

CMF
(CHIMDROPO

Good job; rate is almost normal.

02 00 05 03

LMP
(SPIDER)

I still have some more to go.

02 00 05 24

LMP
(SPIDER)

Okay, Houston. Here comes a little hot fire on

02 00 05 28

CC

Roger. Spider, this is Houston. Would you go

through it slower, please? You are going to have
to go slower.

02 00 05 35

LMP
(SPIDER)

Okay. We'll go TTCA.

02 00 05 40

CC
Roger.

02 00 05 43

LMP
(SPIDER)

We are not going to hold them ... long. We'll just
wait longer between pulses.
Roger. That will really help us out, Spider.

You don't want them held down longer. You just want them longer between pulses. Is that right?

That is affirmative, Spider.

Okay. We'll try it again.

That was up.

Down.

Right.

Left.

Aft.

How was that, Houston?

That looked real good, Spider.

Okay. Here comes the FNGS OTGA check.

Roger, Spider.

Up.

Down.

Right.

Left.

Forward.

Aft.
02 00 07 30  LMF (SPIDER)  How was that?
02 00 07 32  CC  That looked real good, Spider. Everything looks good.
02 00 07 38  LMF (SPIDER)  Okay, Dave. That's all of the hot fire.
02 00 07 40.  CMP (GUMDROP)  Okay. Good job. You moved us away from it.
02 00 07 57  LMF (SPIDER)  And, Houston, you got to give us the update at this time?
02 00 08 02  CC  Roger. I have the PAD ready to go, and can you take an uplink now?
02 00 08 09  LMF (SPIDER)  Roger. The computer is yours; and ready to copy the docked DPS. This is Spider.
02 00 08 14  CC  Roger, Spider. Stand by one.
02 00 08 16  CMP (GUMDROP)  Gumdrop is ready.
02 00 08 18  CC  Okay. Copied you, Gumdrop. And Spider, the uplink is on its way. I'm reading docked DPS: 049 41 3340, minus 00603, minus 17430, minus 00007 17440 all zips all zips, minus 00587, minus 17430, minus 00139. End of update.
02 00 09 24  LMF (SPIDER)  Roger, Houston. Spider reading back: 049 41 3340, minus 00603, minus 17430, minus 00007 17440 all zips all zips, minus 00587, minus 17430, minus 00139.
02 00 09 57  CC  Roger. Very good. The readback was correct.

VANGUARD (REV 31)

02 00 10 02  CMP (GUMDROP)  Gumdrop copied.
02 00 10 21  CC  And, Spider and Gumdrop, it looks like we are making good work on this pass. We've still got about 15 minutes here.
02 00 10 36  LMF (SPIDER)  Houston, Spider here. You broke up.
(COSS NET 1)  

02 00 11 43 LMP (SPIDER) Houston, this is Spider.

02 00 11 45 CC Go, Spider.

02 00 11 47 LMP (SPIDER) Roger. We are going to start the landing radar self-test here if you are ready.

02 00 11 58 CC Spider, this is Houston. The computer is yours. We are standing by for the landing radar self-test. Press ahead.

02 00 12 05 LMP (SPIDER) Okay. The DFI is coming on now.

02 00 12 07 CC Roger.

02 00 16 37 CC Gumdrop, Houston.

02 00 16 40 CMP (GUMDROP) Houston, Gumdrop.

02 00 16 42 CC Roger. We would like to have you bring quad C back on the line when you disable Baker 3.

02 00 16 50 CMP (GUMDROP) Wilco.

02 00 16 57 LMP (SPIDER) Gumdrop and Houston, be advised that Spider did not unstow the radar antenna today.

02 00 17 09 CC Roger. We understood that. Will you be unstowing it for the rendezvous radar self-test?

02 00 17 19 LMP (SPIDER) I don't believe so. I think we can run the self-test without unstowing it. Since we're not going to do the EVA tomorrow, there is no sense in unstowing it. We've already skipped the star check in the daylight, so we have no reason to get it out of the way.

02 00 17 37 CC Roger. Copy.

02 00 17 41 LMP (SPIDER) If you have any other comment, please let us know.

02 00 17 44 CC All right. Sure will.

02 00 17 47 CMP (GUMDROP) And Gumdrop copied.
(GOSS NET 1)

02 00 17 53 LMP (SPIDER) And, Houston, here comes the landing radar spurious noise test.

02 00 17 58 CC Roger. Copy, Spider.

02 00 18 11 LMP (SPIDER) Houston, do you read? Spider.

02 00 18 13 CC Go, Spider.

02 00 18 15 LMP (SPIDER) Roger. How long do you want us to run this spurious noise test here?

02 00 18 18 CC Stand by one.

02 00 18 23 LMP (SPIDER) Roger. Step 16, system 49. We are ready to stop it any time you are ready.

02 00 18 29 CC Roger. Understand. We are taking a look at it, Spider. And, Spider, you can terminate the test now. And, Gumdrop, we would like to have quad C on whether you disable Backer 3 or not.

02 00 18 43 CMP (GUMDROP) Roger. Charlie coming up.

(CANARY (REV 31))

02 00 19 02 CC And, Gumdrop, we are showing your quad balance as excellent. It's looking real great, Gumdrop.

02 00 19 11 LMP (SPIDER) Houston, Spider.

02 00 19 13 CC Go ahead, Spider. This is Houston.

02 00 19 15 LMP (SPIDER) Your R and D telemetry CALIBRATE coming on now.

02 00 19 18 CC Roger. Copy.

02 00 19 37 CC And, Gumdrop and Spider, this is Houston. We have finished up that famous pass with 6 minutes to spare.

02 00 19 48 CMP (SPIDER) Smokey, you are so smooth I just can't believe it. You are just directing us magnificently.

02 00 19 54 CC I'm getting mad with power down here, Spider.
02 00 20 17  LMP  (SPIDER)  Say, Gumdrop, this is Spider.

02 00 20 19  CMP  (GUMDROP)  Go ahead.

02 00 20 20  LMP  (SPIDER)  You are still going to have to disable B3 for a while so we don't get any corona on our radar.

02 00 20 25  CMP  (GUMDROP)  Okay. Say when.

02 00 20 26  LMP  (SPIDER)  How about right now.

02 00 20 27  CMP  (GUMDROP)  Okay. It's disabled.

02 00 20 37  CC  Gumdrop, Houston.

02 00 20 39  CMP  (GUMDROP)  Houston, Gumdrop. Go ahead.

02 00 20 41  CC  Roger. We're still recommending two-jet roll authority - we're recommending Able Charlie roll off.

02 00 20 48  CMP  (GUMDROP)  Houston, Gumdrop. Say again.

02 00 20 50  CC  Roger. We are recommending that two-jet roll authority, roll AC - we'd like to leave it off.

02 00 20 58  CMP  (GUMDROP)  Houston, Gumdrop. You get knocked down with static every time. Try it again.

02 00 21 02  CC  Okay. We would like to stay with two-jet roll authority - recommend in AC stay off.

02 00 21 11  CMP  (GUMDROP)  Okay. Very well. AC coming back off.

02 00 24 00  CC  Say, Spider and Gumdrop. We are going to lose you here in about 1 minute. We'll see you over Tanana at 37, and that was a good show on both vehicles there.

02 00 25 12  LMP  (SPIDER)  Okay-dokey.

02 00 25 13  CMP  (GUMDROP)  Roger. Gumdrop.
Houston, this is Gumdrop - Spider. Before you go - if you are still reading us - We are not reading any range and range rate on the DSKY for the radar.

Roger. Understand. No range and range rates. And, Spider, we'd like to have low bit rate, please.

Roger.

And we are looking at that problem on your range and range rate right now, Jim. We think the stowing of the radar might affect that.

Okay.

Okay. We get the range rate to read this time. ... back again. It's really 497.

Roger. I believe I got that, 497.

Roger.

END OF TAPE
TANANARIVE (REV 31)

02 00 36 52 CC Spider and Gumdrop, Houston through Tananarive. Standing by.

02 00 38 08 CC Spider and Gumdrop, this is Houston through Tananarive. Standing by.

02 00 38 35 CC Tananarive M&O, this is Houston CAPCOMM. Do you read?

02 00 38 48 CC Tananarive M&O, Houston CAPCOMM. Voice check.

02 00 39 59 CT CAPCOMM, Tananarive.

02 00 40 00 CC Tananarive M&O, this is Houston CAPCOMM. Am I coming through to you? Am I going up?

02 00 40 06 CT The first transmission was very low down in the mud. You called back, asked for the M&O; I received it clear, and then we were switched over to Melbourne circuit.

02 00 40 20 CC Okay. Am I going up to the spacecraft at this time?

02 00 40 27 CT ...

02 00 40 28 CC All right. This is Houston CAP ...

02 00 40 29 CT Affirmative.

02 00 40 30 CC All right, Spider and Gumdrop. This is Houston through Tananarive.

02 00 40 42 CC Tananarive M&O, Houston CAPCOMM. Am I receiving a downlink from the spacecraft?

02 00 40 48 CT ... I’ll copy.

02 00 45 02 CC Okay, Spider and Gumdrop. Houston in the blind. If you read me, we will see you over Carnarvon at 53.

CARNARVON (REV 31)

02 00 53 17 CC Spider and Gumdrop, this is Houston through Carnarvon. And, Spider, we would like to have high bit rate.
02 00 53 26  CDR (SPIDER)  Got you, Houston. Going to high bit rate.

02 00 53 30  CMP (GUMDROP)  Gumdrop is with you.

02 00 53 31  CC  Roger. And just maybe till we shoot our COMM, did either of you read me over Tananarive?

02 00 53 38  CDR (SPIDER)  Spider. I read you.

02 00 53 39  CMP (GUMDROP)  And Gumdrop did too.

02 00 53 43  CC  Very good. Thank you.

02 00 53 45  CDR (SPIDER)  Say, Houston, Spider. I've got your stuff for you.

02 00 53 49  CC  Go ahead, I'm ready to copy.

02 00 53 51  CDR (SPIDER)  Okay. Number 1, our helium SUPERCRT pressure is reading again at 750.

02 00 54 02  CC  Roger. Copy, Spider. We're showing 735.

02 00 54 06  CDR (SPIDER)  That's okay. My helium ambient pressure is down to 210. I think that's a little lower than it's supposed to be.

02 00 54 15  CC  Roger. We confirm that. We're showing 208, and it's okay.

02 00 54 20  CDR (SPIDER)  Okay. Be advised we can not initialize the AGS from the PGNCS. We can not initialize the AGS from the PGNCS.

02 00 54 30  CC  Roger. Copy. You can not initialize AGS from the PGNCS.

02 00 54 38  CDR (SPIDER)  Update part of it from the PGNCS to the AGS. The downlink part of PGNCS will not get into the AGS. When we put 10 000 up, it just stays there at 10 000.

02 00 54 50  CC  Roger. Understand that the AGS will not accept the PGNCS downlink.

02 00 54 56  CDR (SPIDER)  Roger.

02 00 55 02  CDR (SPIDER)  Oh, and did you get our message on the rendezvous radar?
Roger. I und - you were going - you were - just about to lose you - You said you had no range rate on the DSKY, and then you did something, and I didn't copy that.

Okay, we got the range to come in to the DSKY one time and the range rate a couple of times, but it's not consistent at all.

Roger. Copy.

Say, Houston, did you get our gimbal angles and that other stuff?

That is a negative. We have not received anything from you over Tananrive.

Okay, Gumdrop. You want to send them down those?

I'll get them.

Okay. Never mind. I guess we have them all. Gumdrop, why don't you send them the torquing angles first?

Okay. Houston, Gumdrop. Are you read to copy?

Go ahead.

Okay. The P52 torquing angles: GET 48:44:00, plus 00213, plus 00042, minus 00117.

Roger. Copy those, Gumdrop.

Roger.

Okay, Houston. And I've got IMU realignment angles for you.

I'm standing by to copy.


Roger, Spider. I copy. For command module: 02029 02856 33357. For the IM: 25202 20876 02659. And we'll go to work on them.
(GOSS NET 1)

02 00 57 31       CDR              Roger. And when you're ready, I've got some
(SPIDER)          AGS calibration data.

02 00 57 35       CC               Roger. I'm ready to copy.

02 00 57 37       CC               I'm ready to copy your data, Spider.

02 00 57 45       CDR              Roger. Stand by.
(SPIDER)

02 00 57 52       CDR              Okay. The bias coefficients before the CAL:
(SPIDER)          minus 77777, plus all zips, minus all 7's. The
gyro drift: we're plus 00027, plus 00047, plus 00006. Did you copy those?

02 00 58 20       CC               Roger. I copied those.

02 00 58 24       CDR              Okay. And following the CAL: plus all zips, plus
(SPIDER)          all zips, minus all 7's. And the gyro drift after
the CAL: plus 00021, plus 00036, minus 00020.

02 00 58 48       CC               Roger, Spider. I copy those.

02 00 58 54       CDR              Okay. And the only other thing I need right now
(SPIDER)          is the procedure from one of the AGS guys on
how to get 414 back to zero. As I recall, you can
not simply set it to zero; you have to go through
a little procedure, there. I wonder if you would
get that for us.

02 00 59 12       CC               Roger, Spider. I copy. 414 back to zero, and that's

02 00 59 26       CC               in work.

02 00 59 26       CC               And, Gumdop and Spider, I'd like to have both
vehicles with S-band up. We'll be going over to
Honeysuckle in a couple of minutes.

02 00 59 34       CMP              Gumdop.
(GUMDROP)

02 00 59 37       CDR              Spider.
(GUMDROP)

02 00 59 49       CC               Spider, Houston.

02 00 59 52       CDR              Go.
(SPIDER)

02 00 59 54       CC               Roger. We're suspecting a leak in the DPS helium

02 00 59 54       CC               manifold, and, stand by one. And we'd like to have
you take a look at DPS malfunction procedure number 1.
Goss 32/5
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02 01 00 15  CDR (SPIDER)  Roger.
02 01 00 53  CC  Spider, Houston.
02 01 00 55  CDR (SPIDER)  Go.
02 01 03 57  CC  Roger. We just noticed you doing a VERB 47 there, and we'd like to have you try the initialization again.
02 01 01 07  CDR (SPIDER)  Roger. Understand. You want us to do it again?
02 01 01 11  CC  Stand by one.
02 01 01 14  CDR (SPIDER)  Roger. Be advised we tried to VERB 47 two times, and it seems to come out of the PGNCS okay, but the AGS 414 never goes back to zero.
02 01 01 37  CC  Roger. I copy that, Spider, and I have your torquing angles while we work on that.
02 01 01 45  CDR (SPIDER)  Roger. Just stand by just one.
02 01 01 46  CC  Roger.
02 01 01 50  CDR (SPIDER)  Ready to copy.
02 01 01 52  CC  Roger. Reading your torquing angles: minus 00040, plus 00180, minus 00160.
02 01 02 14  CDR (SPIDER)  Roger. Copy minus 00040, plus 00180, minus 00160.
02 01 02 25  CC  That's affirmative. We confirm those.
02 01 02 29  CMP (SPIDER)  Roger. Thank you.
02 01 02 31  CDR (SPIDER)  Houston, do you want us to close the Ascent helium REG 1?
02 01 02 34  CMP (SPIDER)  And if ... what do you want us to do on this procedure?
02 01 02 39  CC  Roger. We copy that, Spider. Stand by one.
HONESUCKLE (REV 31)

02 01 03 05 CC Spider, Houston.
02 01 03 08 CDR (SPIDER) Go.
02 01 03 10 CC Roger. We would like to have you try that initialization again while we've got some data here on you.
02 01 03 18 CDR (SPIDER) Roger. Will do.
02 01 03 27 LMP (SPIDER) Gumdrop, are you sort of angling toward the burn attitude here?
02 01 03 31 CMP (CUMDROP) Roger. That's affirm.
02 01 03 37 CDR (SPIDER) Okay.
02 01 03 39 CC Spider, this is Houston.
02 01 03 41 CDR (SPIDER) Go ahead, Houston.
02 01 03 42 LMP (SPIDER) ... Spider.
02 01 03 43 CC Roger. We misinterpreted your question here. We would like to have you press ahead with MAL 1, and just press right ahead.
02 01 03 53 CDR (SPIDER) Okay. What --
02 01 03 54 CC Go ahead, Spider.
02 01 03 55 CDR (SPIDER) You want 10 and 12?
02 01 03 56 CC That is affirmative. Go ahead and press through blocks 10 and 12.
02 01 04 00 CDR (SPIDER) Okay.
02 01 04 08 CDR (SPIDER) The downlink is in process with the AGS, Houston.
02 01 04 18 CC Spider, Houston. Say that again.
02 01 04 20 CDR Roger. We threw in a VERB, and doggone if it didn't go in that time.
02 01 04 27 CC Roger. We waved our magic wand over it through Honeysuckle, there, Spider.
02 01 04 33 CDR (SPIDER) You guys got what it takes with SIM SUP.
02 01 04 36 CC That's affirmative.
02 01 07 00 CC Spider, Houston. I have a little bit of info when you are ready to listen. No need to copy.
02 01 07 06 CDR (SPIDER) Okay, good. I'm a good listener. Be advised that our regulator pressure doesn't seem to be dropping. It's holding at about 232; that's for the DPS.
02 01 07 19 CC Roger. What is your regulator pressure, Spider?
02 01 07 23 CDR (SPIDER) That's right. We were reading off the fuel and oxidizer pressures. They are both reading 232, and have been since I closed the REG. Also, my ambient tank has been holding at about 210.
02 01 07 29 CC Roger. Copy 210.
02 01 07 42 CC And, Spider, my little tidbit here is that during our hot-fire test, we do have a thrust chamber pressure switch failed CLOSED on thruster B4 UP. It failed on the first firing. It will have no effect to you at all with the exception that the caution and warning will not detect an OFF failure of that thruster. That is Baker 4 UP.
02 01 08 23 CDR (SPIDER) Okay, will it detect an UP - stuck ON thruster?
02 01 08 34 CC Stand by. That is affirmative.
02 01 09 14 CC Spider, Houston. This sensor is not used in the thruster ON logic, it's strictly thruster OFF, so the answer to your question is affirmative. Caution and warning will detect a thruster ON failure.
02 01 09 29 CDR (SPIDER) Okay.
02 01 09 41 CDR (SPIDER) And, Houston, do you want me to press on any further with this malfunction procedure, or do you just want me to open up that REG again?
(GUM DROP 1)

02 01 09 48 CC Stand by, Spider.

02 01 10 06 CC Spider, Houston. We would like to have you go back to normal configuration. Open regulator 1.

02 01 10 10 CDR (SPIDER) Roger. It's open on COMM TECH's three, and be advised that we're just about in a posture to perform the DPS burn at this time and get some last minute checks.

02 01 10 24 CC Roger. Understand. I'm about to lose you at Honeysuckle. We can have you through the Huntsville with no loss.

02 01 10 35 CDR (SPIDER) Roger.

HUNTSVILLE (REV 31)

02 01 13 23 CMP (GUMDROP) Spider, Gumdrop.

02 01 13 26 CDR (SPIDER) Go ahead.

02 01 13 28 CMP (GUMDROP) When we start a maneuver to burn attitude ...

02 01 13 32 CDR (SPIDER) Say again?

02 01 13 33 CMP (GUMDROP) Roger. When we maneuver, it will be to the burn attitude ...

02 01 13 42 CDR (SPIDER) It will ...

02 01 13 45 CMP (GUMDROP) Okay.

02 01 17 39 CC Spider and Gumdrop, if you read me, we will see you over the Redstone at 28.

02 01 17 53 CDR (SPIDER) Roger. Spider reads you.
GOSS NET 1

MERCURY (REV 31)

02 01 18 13 CDR
(SPIDER)
Gumdrop, did you read them at all that time?

02 01 18 15 CMP
(GUMDROP)
I think he said he would see us somewhere, sometime.

02 01 18 19 LMP
(SPIDER)
Yes, ...

02 01 18 21 CC
Okay, Gumdrop, Spider. That's Redstone at 28.

02 01 18 25 CDR
(SPIDER)
Now we read you loud and clear.

02 01 18 26 CMP
(GUMDROP)
Gumdrop the same.

02 01 18 30 CC
Okay. Well, we couldn't get you through the Huntsville with an elevation angle of 9 degrees, and we can go through the Mercury with an elevation of 0.8.

02 01 18 41 CDR
(SPIDER)
Something wrong there.

REDSTONE (REV 31)

02 01 28 31 CC
Spider and Gumdrop, this is Houston through the Redstone.

02 01 29 01 CDR
(SPIDER)
How does the direction look to you out there?

02 01 29 10 CC
Spider and Gumdrop, Houston through the Redstone.

02 01 29 14 LMP
(SPIDER)
Yes, it looks like I am facing south.

02 01 29 20 LMP
(SPIDER)
I assume they gave us the docked DPS-REPSTMAT, didn't they?

02 01 29 26 CMP
(GUMDROP)
He's checking.

02 01 29 37 CC
Spider and Gumdrop. Do you read? Houston.
02 01 29 44  CCP  (GUMDROP)  Gumdrop is with you.

02 01 29 45  CC  Okay, Gumdrop, I'm copying you. Would you pass on to Spider that when he arms the DPS he may get a descent REG warning light due to the low manifold pressure.

02 01 30 02  CCP  (GUMDROP)  Roger. Understand he may get a descent warning light due to the low manifold pressure, right?

02 01 30 11  CC  That is descent REG warning light, and he may get that when he arms the DPS.

02 01 30 19  CCP  (GUMDROP)  Roger. Got you there. Descent REG warning on when he arms the DPS. You copy that, Spider?

02 01 30 23  CDR  (SPIDER)  Roger. REG warning when arm DPS.

02 01 30 28  CCP  (GUMDROP)  Okay. That is what he said.

02 01 30 31  CC  Okay. Thank you, Gumdrop. And we are standing by for your burn.

02 01 30 35  CCP  (GUMDROP)  Roger.

02 01 30 38  CDR  (SPIDER)  And, Houston, do you want high bit rate here?

02 01 30 43  CCP  (GUMDROP)  Houston, Gumdrop. Do you want high bit rate out of the Spider?

02 01 30 45  CC  I copy, Spider then Gumdrop. Yes, we do want high bit rate.

02 01 30 51  CCP  (GUMDROP)  Roger. Affirmative on high bit rates, Spider.

02 01 31 37  CC  Spider and Gumdrop, this is Houston. You are GO for the docked DPS burn.

02 01 31 40  CDR  (SPIDER)  Roger. We're GO.

02 01 31 42  CCP  (GUMDROP)  Gumdrop understands GO.

02 01 31 45  CC  And, Spider, we are copying you loud and clear now.

32 01 31 49  CDR  (SPIDER)  Gumdrop, why don't you go to FFAZ, and we will take control here.
02 01 31 53  CMP  (GUMDROP)  Roger. Gumdrop is in FREE.

GOLDSTONE (REV 32)

02 01 34 16  CDR  (SPIDER)  Roger. Looks about right over here too.

02 01 34 23  CDR  (SPIDER)  Yes, that's ... ballpark.

02 01 36 40  CC  Spider, Houston.

02 01 36 45  CDR  (SPIDER)  Houston, Spider.

02 01 36 48  CC  Roger. We are showing the AGS address 407 as 10 000, vice the checklist as 0000.

02 01 37 05  CDR  (SPIDER)  Roger. Thank you.

02 01 37 07  CC  You're welcome.

02 01 38 25  CC  Spider, Houston.

02 01 38 27  LMP  (SPIDER)  Go.

02 01 38 29  CC  Okay, Rusty. That 407 flipped to 10 000 again; we are recommending that you set zero and enter right around ignition.

02 01 38 46  LMP  (SPIDER)  Houston, you cut off there. Say again.

02 01 38 48  CC  Roger. Your address 407 in the AGS has now gone back to 10 000; we are recommending you set up 0000 and enter right around ignition time.

02 01 39 02  LMP  (SPIDER)  Roger.

02 01 39 51  LMP  (SPIDER)  A minute, 45 seconds, Gumdrop.

02 01 39 54  CMP  (GUMDROP)  Roger. I'm with you.
Bay, Houston. We are right over a white deck of clouds, and is it ever bright!

Roger. Copy.

One minute.


Okay. 28 seconds.

15 seconds, Gumdrop.

Ullage on.

Ullage is on.

...

Okay. Ignition.

I'm throttling up to 40 percent, Dave.

It's 40 percent.

Stand by for the autopilot.

Okay. Stand by for the autopilot. Descent REG light now.

It's gone down --

The pressure's gone down. Here comes the throttle up.

Okay, the pressure dropped down to about 190, there, Houston.
CC 02 01 42 13  Roger. We copied it, Spider.

CDR (SPIDER) 02 01 42 15  We're full throttle, and the attitude errors are practically nil, Davy.

CMP (GUMDROP) 02 01 42 19  Okay. Looks pretty good over here too.

CDR (SPIDER) 02 01 42 22  Yes, ditto. Flying this thing...

CMP (GUMDROP) 02 01 42 26  Okay. Your HP is 109 and holding.

CDR (SPIDER) 02 01 42 27  Thank you. Got 440 to go.

CMP (GUMDROP) 02 01 42 29  I've got 443.

CDR (SPIDER) 02 01 42 36  I'm pulling 8/10 of a lunar g in case you're interested. We're starting to get a little excursion in high yaw.

CC 02 01 42 43  Roger. Copy.

CMP (GUMDROP) 02 01 42 44  You surely can't see much out the tail end here.

CDR (SPIDER) 02 01 42 49  We just threw a big hunk down on the ground there. There goes another hunk.

CMP (GUMDROP) 02 01 42 52  Yes, I saw a few pieces go, too.

CMP (GUMDROP) 02 01 43 02  Gee, I got 405.

CDR (SPIDER) 02 01 43 05  Roger. So do we.

LMF (SPIDER) 02 01 43 07  And the FGNCS and AGS are count down right together.

CMP (GUMDROP) 02 01 43 10  Okay. 109.3 on the HP.

CDR (SPIDER) 02 01 43 12  Roger.

CDR (SPIDER) 02 01 43 19  Man, am I hungry!
02 01 43 24  CMP
(CUMDROP)  Looks pretty smooth.

02 01 43 25  CDR
(SPIDER)  Yes, it really is. It's going along like a dream.

02 01 43 28  CMP
(GUMDROP)  Sure losing pieces back there; some of the foil's coming off.

02 01 43 32  CDR
(SPIDER)  Yes. Hey, we're going over Texas right now, I think. We ought to be over Houston pretty soon.

02 01 43 40  CMP
(GUMDROP)  03:30.

02 01 43 42  CDR
(SPIDER)  Okay. 03:30 here. Attitude errors are staying down to less than 1 degree.

02 01 43 47  CMP
(GUMDROP)  Roger. 109.3 HP.

02 01 43 49  CDR
(SPIDER)  Okay.

02 01 43 53  CDR
(SPIDER)  We have 1100 feet per second to go.

02 01 43 55  CMP
(GUMDROP)  Right with you.

02 01 43 57  LMP
(SPIDER)  Ken, the ACS and the PGNCS are right together.

02 01 44 00  LMP
(SPIDER)  And for the information of the ground and the tape, the quantity is reading 76 and 74, and we don't seem to have any spurious lockups at this time.

02 01 44 12  CC  Roger, Spider. Houston copies.

02 01 44 15  CDR
(SPIDER)  REG pressure is holding pretty steady; it's about 232.

02 01 44 20  LMP
(SPIDER)  And the landing radar temperature is reading 95 at the present and started out at 81.

02 01 44 28  CMP
(GUMDROP)  Okay. HP is 109.3, and everything's clean over here.

02 01 44 31  CDR
(SPIDER)  Okay, same here. Looks like it's done a real good job of steering.
02 01 44 37 ILM (SPIDER) We've only got 890 feet per second left to go.

02 01 44 40 CMP (GUMDROP) I'm 885 when you called in.

02 01 44 42 CDR (SPIDER) Okay.

02 01 44 43 CMP (GUMDROP) 229.

02 01 44 44 CDR (SPIDER) Roger. 225 here.

02 01 44 51 CDR (SPIDER) Okay. Roger. I'm going to start my throttle profile at 124.

02 01 44 55 LMP (SPIDER) Roger.

02 01 45 08 CMP (GUMDROP) I've got 2 minutes.

02 01 45 10 CDR (SPIDER) Two minutes here. I have 724.

02 01 45 13 CMP (GUMDROP) 109.2

02 01 45 15 CDR (SPIDER) Roger.

02 01 45 21 CMP (GUMDROP) Your rates on all axes are less than a tenth of a degree per second.

02 01 45 25 CDR (SPIDER) Is that right? I'm going to go to attitude hold.

02 01 45 26 LMP (SPIDER) -- rates look solid here.

02 01 45 30 CDR (SPIDER) 600 feet per second to go.

02 01 45 33 CMP (GUMDROP) Right with you.

02 01 45 42 CDR (SPIDER) Okay. I've got about a minute, 25.

02 01 45 45 CMP (GUMDROP) Right with you.
Okay, when I start throttle, we're going to add a lot of seconds on to that.

Roger.

450.

420 to go.

One minute.

One minute now.

109.2.

Roger. Hanging right in there, isn't it?

Yes, really slick.

We are getting a roll, or some sort of an oscillation now. It's got --

Hell, yes! We're getting slosh!

I've got 228 to go, and the camera coming back on.

Get ready for throttle profile.

Roger.

Thirty.

Okay, 170, 157, 145.

Firing the throttle, 40 percent. Going down to 10 percent. Coming back up to 40 percent. Back down to 25 percent.

Back up again.
Okay. Coming up to 40 percent. Throttle profile complete, and just let it sit there.

... point one.

Roger. 24 seconds to go.

I'm going to shut down the area at 3 seconds to go. I've got 18, 16, 15, 14, 13 - -

No sweat.

12, 10, 9, 8 - get your hand out of - 6, 5, 4, 3, shutdown!

... attitude hold, here.

Right with you, all the way.

Okay.

And, Spider, that was a beautiful burn. Man, you were right down the tube.

Looked pretty neat from here, too.

You want our residuals, Houston?

I can copy them on your DSKY now, Spider.

Okay, very good.

Say, you know what? You really feel that stuff sloshing around here at the end.

I thought the MAX rate you got was about 3/10 of a degree per second.

Yes, with the offset that I had on my rate scale over here, I can't tell where zero is, but it didn't deviate hardly at all.
That was mighty beautiful all the way, Spider.

Okay.

Roger. Landing radar temperature is 100 degrees right now.

Roger. Copy. 100 degrees, end of burn.

When you're in the groove, man, you got to do that!

Even the AGS were good; the AGS 500 degrees, plus 3 ...

Okay.

And, Spider, Houston. I copy 500 501 502, plus 3, minus 5, minus 0.

And I got - the Gumdrop's got 271.7 by 109.1.

Roger, Gumdrop. Houston, copy.

Exciting the way the fuel and oxide pressures dropped off, there, during the sputter.

Houston, you are going to get a DFI CAL.

Roger. Understand you're getting DFI CAL.

Houston, how long do we have to that burn 5?

Stand by one, Spider.

Okay, I'm going to get something to eat. All I've had so far today is a little bag of fruit salad. I'm about to starve to death, and I'm going to try to get something to eat right after we finish this burn.

DFI CAL complete.
02 01 52 41  CC  Spider, Houston.
02 01 52 44  CDR  (SPIDER)  DFI power is off.
02 01 52 49  CC  Spider, Houston.
02 01 52 53  CDR  (SPIDER)  Houston, Spider.
02 01 52 54  CC  All right, we're going to do SPS-5 at the nominal time, and that's 3 hours and a half from now.
02 01 53 01  CDR  (SPIDER)  Okay. Very good. Thank you.
02 01 53 03  CC  Roger.
02 01 53 13  LMP  (SPIDER)  Gumdrop, Spider.
02 01 53 15  CMP  (GUMDROP)  Go.
02 01 53 16  LMP  (SPIDER)  Roger. We'd like to stop at an AGS CAL attitude here somewhere.
02 01 53 20  CMP  (GUMDROP)  Very well.

CANARY (REV 32)

02 01 56 00  CMP  (GUMDROP)  Okay, Spider. I'll have it over to you in about 3 minutes.
02 01 58 47  CMP  (GUMDROP)  Okay, Spider, Gumdrop. That ought to be pretty close.
02 01 58 55  CDR  (SPIDER)  ...
02 01 59 22  O  Spider, Houston.
02 01 59 31  LMP  (SPIDER)  This is Spider. Go ahead.
Roger. Spider, we would like to ask you if, after you finish eating there, before you transfer back, if there would be any chance of getting the regulator check, checklist systems page 17.

Yes. Okay.

Roger. We'll get it.

Okay. Thank you.

...

I'm going to eat first, though, before I just drop over up here.

Roger. I just wanted to pass that on, before you dismantled something. We would really like to see you go ahead and eat, and we'll see you over Tananarive about 13.

Roger.

And, Spider, we would like to have low bit rate.

Roger. Low.
Apollo 9 - excuse me. Spider and Gumdrop, this is Houston through Tananarive. Standing by.

Spider and Gumdrop, this is Houston. Spider, we would like to have high bit rate.

Roger. High bit rate, Houston.

Copy. And I've got you through Carnarvon. You are five-square.

Roger. Understand. Five-square, and we've already started the waterboiler dryout. We will do the REG check tomorrow.

Roger. Understand. You will do the REG check tomorrow.

And Spider, we would like - if you agree - to do a VHF B check here and secondary S-band check.

Okay. Go ahead.

Roger. Spider. We would like to do a VHF B check here, if you agree.

Roger. We agree. Go ahead with your instructions.

Roger. Stand by one.

Spider, Houston. Roger. Could we get some AGS calibration data?

Roger. Stand by.

Roger.

Okay. You ready to copy?
Spider, let's configure your spacecraft for ... B operation and I will copy your calibration data as a COM check.

Okay. We are on B. Do you read?

Okay. Carnarvon M&O, this is the Houston CAP COMM. I want you to REMOTE VHF B only.

Carnarvon M&O, did you read? Houston CAP COMM.

Houston, Apol - Spider. How do you read?

I'm reading you five-square. Let's go with the AGS calibration data.

Roger. The initial readings are the same as final readings before, right?

Okay.

Plus all zips, plus all zips, minus all 7's, plus 21, plus 36, and minus 20.

Okay. We've got that on the tape. That was a little fast.

Okay. Here is the final data after the CAL. It was plus all zips, plus all zips, minus all 7's.

Copy.

And stand by here.

Roger.

Hey, I beg your pardon. I powered down before I read them out.

Roger. Understand.

Stand by just one. I'll power back up and read them out.

Okay, Houston. Are you still with us?
That is affirmative. We've got you here for another 6 minutes or so across Carnarvon.

Okay. 54445 and 46 read: plus 7, plus 28, and plus 0.

Roger. Copy plus 7, plus 28, plus 0. Thank you very much, and we do have a good VHF B system. Could you give us a secondary S-band check as per system 20 at this time?

Roger. Stand by.

And Carnarvon No. 1, this is Houston CAP COMM. would like for you to REMOVE S-band back to Houston.

Okay, Houston. How do you read now?

I'm reading you loud and clear, Spider.

Okay. That's step 1. I'm ready to go to step 2.

All right. Let's go to step 2.

Okay, Houston.

Spider, this is Houston. Do you read?

Roger, Houston. How do you read Spider?

That's beautiful. That's loud and clear, Spider.

Roger. Same here.

Okay. That takes care of that. We are ready for step 3.

Roger. Going to step 3.

Okay, Houston. How do you read Spider now?
02 02 36 43  CC  You are five-square, Rusty. That is real nice. Everything sounds great on that check. And while we've got you in the mood, would you care to do an S-band backup voice check? That's on page --

02 02 37 04  LMP  Houston, Spider. Try that once again.

02 02 37 08  CC  While we've got you in the mood, would you care to try an S-band backup voice check as per systems 27?

02 02 37 16  LMP  Roger, I just got the last two words of that. Say again.

02 02 37 21  CC  An S-band backup voice check, as the checklist system 27.

02 02 37 30  LMP  Roger.

02 02 38 21  LMP  Houston, this is Spider. How do you read on backup voice?

02 02 38 24  CC  Spider, this is Houston. Loud and clear. How me?

02 02 38 34  CC  Spider, this is Houston. How do you read me on the backup voice?

02 02 38 43  CC  Spider, this is Houston. I'm reading you loud and clear. How do you read me?

02 02 39 02  LMP  ... is better now.

02 02 39 05  CC  Spider, you're loud and clear. How me?

02 02 39 09  LMP  Okay, you are five-square. I'm supposed to be able to talk to you without pushing PTT. I'm not sure I'm getting backup voice down to you. Tell me if you read up through 5 and back down. 1, 2, 3, 3, 2, 1.

02 02 39 26  CC  Okay. Spider, Houston. You blanked out at 3 on the way up and came in with 3 on the way down.
02 02 39 35  LMP  Okay. I was using PTT up to 3 and from 3 down, and I understood the backup voice was supposed to go right off the intercom.

02 02 39 49  CC  Spider, check BIOMED OFF, and give me another fast check.

02 02 40 01  LMP  Roger. The BIOMED is OFF.

02 02 40 06  CC  Roger. Verify BIOMED OFF.

HONEYSuckle  (Key 32)

02 02 40 17  CC  Okay, Spider. We've got you through Honeysuckle now. How are you reading me?

02 02 40 58  CC  Spider, this is Houston through Honeysuckle. How do you read me?

02 02 41 04  LMP  ...

02 02 41 08  CC  Okay, Spider. I could hear you transmitting there. You were way down and breaking up. How about giving me a short count here? We are supposed to be locked up on you.

02 02 41 20  LMP  One, 2, 3, 4, 5, 6, 7, 8, 9, 0, Spider out.

02 02 41 25  CC  Okay, Spider. You are relatively clear, but way, way down.

02 02 41 31  LMP  ...

02 02 42 22  CC  Spider, this is Houston. We'd like to have you return to COMM basic.

02 02 42 58  CC  Spider, this is Houston. I'd like to have you return to COMM basic and give me a check.

02 02 43 03  LMP  Roger, Houston. We are COMM basic. How now?

02 02 43 07  CC  Okay. You're coming through clear now, Rusty. And we did get the backup voice check in. It will just way your low.
(CGSS NET 1)

02 02 43 17 LMP (SPIDER) Roger.
02 02 43 20 CC And we'd like to have the BIOMED switch on the LMP for the rest of the time, Spider.
02 02 43 33 CMP (GUMDROP) Spider, Gumdop. The tunnel is clear.
02 02 43 40 CDR (SPIDER) Roger. It is on the LMP, Houston.
02 02 43 43 CC Roger. Understand. Thank you, Spider.
02 02 43 48 CDR (SPIDER) Be advised we are presently 28 minutes into the sublimator dryout.
02 02 44 01 CC Roger, Spider. I copy that. 28 minutes into the dryout.
02 02 44 05 CDR (SPIDER) Roger, and ...
02 02 44 12 CC Okay, Spider. You are breaking up. You will have to repeat that for me, please.
02 02 44 29 CC No VHF -
02 02 44 32 CC Okay, Spider and Gumdop. I think we are about to drop you here at Honeysuckle. We'll be over Huntsville in a couple of minutes if you want to talk there, and Hawaii at 59.

HUNTSVILLE (REV 3?)

02 02 58 03 LMP (SPIDER) Gumdop, Spider.
02 02 58 06 CMP (GUMDROP) Go ahead ...
02 02 58 08 LMP (SPIDER) Roger. Stand by. Not yet.
02 02 58 12 CMP (GUMDROP) What do you need?
02 02 58 15 LMP (SPIDER) Just checking the COMM.
And Gumdrop, this is Houston. We've got you through Hawaii now.

Gumdrop. Roger.

Gumdrop, Houston. We'd like to turn the heaters and H₂ tanks 1 and 2 off.

Okay. Have to stand by for that one.

Roger. Understand. No sweat.

Okay. I'd like to give flow to you.

Gumdrop, can you give me call?

You've got full flow, haven't you?

I don't know; I can't tell.

Yes, I gave it to you when you first called it.

Okay. I'm going to switch COMM so give me a few seconds and then turn my suit power off.

Okay.

Houston, say again the heaters and fans.

Roger, Gumdrop. We would like to turn off the heaters in both H₂ tanks.

Roger. Both H₂ heaters OFF.

Roger. Thank you.

Gumdrop, Houston. You might watch your middle gimbal.
02 03 08 02  CMP (GUMDROP)  Roger. Thanks, Houston; got an eye on it.
02 03 08 19  CMP (GUMDROP)  We got two eyes on it.
02 03 08 28  LMP (SPIDER)  Houston, this is the Spider.
02 03 08 30  CC  Go, Spider.
02 03 08 33  LMP (SPIDER)  Roger. We've been running the dry-on now for 52 minutes and we are just starting the circulator pull out and the glycol temperature is right now 70 degrees. We are ... through it.
02 03 08 44  CC  Roger. Copy.

GOLDSTONE (REV 32)

02 03 11 00  CC  And Gumdrop, this is Houston. Just to remind you again about the gimbal lock. You are just making us nervous.
02 03 11 08  CDR (GUMDROP)  Roger. We've got somebody in the couch watching it at all time now.
02 03 11 12  CC  All right. Okay. Thank you.
02 03 13 19  CMP (GUMDROP)  Houston, this is Gumdrop. How do you read?
02 03 13 24  CC  Gumdrop, we read you loud and clear.
02 03 13 26  LMP (SPIDER)  Okay, this is Spider. I figure our water boiler is dry at 57 minutes, and we have a lot of power on, and I want to give you a CAL here.
02 03 13 35  CC  Roger. You must be a mind reader; that's just what we were thinking.

TEXAS (REV 33)

02 03 17 57  CMP (GUMDROP)  Houston, this is Apollo 9.
Calling Houston. Say again, please; I didn't get it, Gumdrop.

Gumdrop, this is Houston. I did not copy your last transmission.

Gumdrop, this is Houston. I did not copy your last transmission.

Gumdrop, this is Houston. How do you read?

Five-by, Houston. Go.

Roger, I'm reading you real good now. I couldn't copy off Texas then. You made a transmission; I did not get it.

Roger, Houston. This is Apollo 9. We would like to know what the position of our translunar bus tie circuit breakers are supposed to be. They are both circuit breaker panel 11 and 16.

Roger, Apollo 9. Copy. Stand by.

Just for when we're leaving the spacecraft.

Roger. Understand.

Okay, Apollo 9. Those translunar bus tie circuit breakers are to be OPEN, I say OPEN.

Both of them will be OPEN. Roger.

Apollo 9, Houston. About 1 minute LOS Vanguard. We will see you over Ascension at 36.

Roger.
ASCENSION (REV 33)

02 03 36 37 CC Apollo 9, this is Houston through Ascension. Standing by.

02 03 36 42 CMP Roger, Houston. Apollo 9.

02 03 39 36 CC Apollo 9, Houston. No need to acknowledge, but we are showing you with – you'll probably get a MASTER ALARM in about a minute on the H₂ pressure.

02 03 39 46 CDR Houston, you are off by about 59 seconds on that one. It came on while you were talking. Very good.

02 03 39 54 CC Okay. Thank you.

END OF TAPE
APOLLO 9 AIR-TO-GROUNDED VOICE TRANSCRIPTION

(0023 NET 1)

APOLLO 9, Houston. We're going to lose you at Ascension in about a minute. We'll see you over Tennessee at around 51.

--- --- --- CC

Roger.

--- --- --- IMP

(APOLLO 9)

ASCENSION (NET 33)

02 04 07 30 CC Apollo 9, Houston through Carnarvon. Standing by.

02 04 07 36 GRP Roger, Houston, Apollo 9.

02 04 07 38 CC Roger. We're going to have you here for about 11 minutes at Carnarvon, and if you can handle it we would like to initiate a waste water dump at this time and dump it down to 25 percent.

02 04 07 31 CC Okay. Waste water down to 25. We're all back in the command, the tunnel is closed out, and everything looks okay.

02 04 07 39 CC Okay, sounds great, Apollo 9.

02 04 08 30 CC And, Apollo 9, this is Houston. Just at your convenience, when you have a couple or three minutes to talk I've got several questions that can be handled at any time. I'd just like to start working down the list before we get to close in to the burn.

02 04 09 07 CEx Okay. Stand by.

02 04 09 09 CT Roger.

02 04 10 00 CEx Go ahead. Houston, Apollo 9.

02 04 10 03 CC Roger. There are a couple of questions we have, one is on the adjustment of this VAX sensitivity during our GCM test. We're trying our best to troubleshoot some of our difficulties, and we would like to have any comments that you could give us in that regard.

02 04 10 24 CEx Well, we finally ended up with the VAX sensitivity up about 6 and a half or 9. We still
(COMM NET 1)

wadedn't getting the FSS to the ground, though. We could read him from --

02 04 10 45 CC

I'm sorry, you broke out there, Apollo 9. Said you could read and then say again all after.

02 04 10 51 CSM

I'm thinking.

02 04 10 53 CC

Oh, okay. I'm sorry.

02 04 11 10 CSM

Houston, we were reading - We had communications from the FSS to the CSM, from the CSM back to the FSS. I guess we were just having trouble getting to the ground, and even though I had the VOX sensitivity up to about 6 and a half or 7, which is about as high as it goes, we still weren't able to get him to trigger the VOX, I guess.

02 04 11 39 CC

Roger. Copy. And you know I wasn't getting the CSM at all, in the Tama-Milla pass, and down over the Mercury you came in loud and clear. It looked like, at one time there during the Mercury, we were going to have real good CSM, and then it got pretty again. Okay, that's enough on that one, then, unless TELL CSM will come up with some more questions. If you have anything else to add on it they would like to take it at this time.

02 04 12 08 CSM

Okay, I don't believe so.

02 04 12 09 CC

Okay. And I'm curious about the foil coming off of the Griffin during the burn. Were they, you know, large chunks, small, is there any thing you would like to elaborate on that?

02 04 12 29 CSM

I couldn't say. The stuff I saw I couldn't say for sure was foil. I think Dave said that - just a minute.

02 04 12 24 CMP

Yes, looked like there were some pieces, maybe 2 to 3 inches square in area, but not square in dimension. They weren't clean pieces like something that was supposed to be there left. It looked it might have been scraps or something that had been hanging loose, but I did see some that were black and some that were partially black, and silver, and they came off pretty fast, so it was hard to track them.
That's kind of - They stayed with us. They didn't look like they were being shot out of the engine or anything. They stayed with us and we sort of left them, but not too rapidly, and they were sort of down between from us toward the ground, and I couldn't tell exactly where they originated.

Yes, I couldn't tell where they came from, either.

Okay, Apollo 9, copied that. That was a real good description, and the other question, I was wondering if you would care to comment if in all that hubbub if you had a chance to try out the LH drinking fountain.

Roger. I did, and there seemed to be appreciably less water in the LH system than there was - I mean in the LH system than there is in the command module. It's much better over there.

Okay. How was the temperature of the water?

It was pretty good; it was cool. It was very tolerable.

Okay, sounds great, and I would like, if you haven't buried them, the battery voltages and so forth that was on the checklist, they're system 74, at your convenience.

Battery check voltages, Houston?

I'm ready to copy, Apollo 9.

Roger. Batteries 1 through 4 with 31 volts. Battery 5 and 6 were 37. Commander's BUS and System Engineer's BUS were 31 and 31. ED EAST A was 36.5. ED EAST B was 37.2.

Roger. Very good, Apollo 9. We got those.

Tonight, probably after this next burn, I'd like to go over with you what we are going to do tomorrow.

Okay. Very good; we agree to that.
Do you have a plan for us, or are you open for suggestions, or what?

Roger. We would rather wait until after the burn and then we can get together and have a meeting of the minds.

Okay.

That pretty well takes care of my list. One other question: I take it from your comments that the rendezvous self test, we never did get any good, valid data from that, is that affirmative?

Not consistent, no. Occasionally, one time we got the range to come into the computer and three or fours times, maybe, for range rate; but from the computer ten times we got nothing.

It wasn't anything we could pin it down to.

Okay. Copy that, and just as a last item, I would like to alert you I'll be calling you again right after EPS fire that we want to initiate a charge on battery B.

Okay.

And that's all I have. We are going to have you here for about another minute and a half and then we will see you - We can talk through the Huntsville about 25; if not, Hawaii at 35.

Okay. We speak sayonara at Cape Canaveral, Apollo 9, and we would just like to have you take a look at the middle global.

We'll watch it.

Okay. We are too.

Seems like we are getting some disturbance torque as we go around.

Roger. Copy.
Apollo 9, this is Houston. We've got you through Hawaii. Standing by, eyesing the old gimbal.

Roger. We're dumping the water.

Roger.

You know, we've been sitting watching this gimbal, too, and I've been chasing the thing all day long. It seems to seek the red bullet - the red dot in the center of this thing, and I wonder if we are not trimming along the flight path angle. What would you say to that?

By jove, I believe that requires some heavy concentration on our part.

Well, it will give you something to do tonight.

What you are trying to say is, you are being stabilised with the gravity gradient, then?

I guess I don't really know what I'm saying, is the reason why. I don't really understand it, but it seems to seek the in-planeness, even when you get it sort of moving away from the gimbal lock area, it stops and starts to move back unless you have enough rate. If you have enough rate to move away from it permanently, it will swing around to the other side.

By jove, that's a real good observation. How about vertically? Is it trying to align itself vertically too, along the gravity gradient?

No, I don't think so. I haven't noticed that so much, just seems in any roll orientation, it seems to want to go to the in-planeness. I guess maybe we can watch the vertical alignment tomorrow to see if it is gravity gradient.

Okay. I've got another question for you, Dave. Did you get any alarms during the day from the cryo tanks?

No, not a one. Not until you called. That was the first one.
Okay. Thank you.

Hey, Smokey?

Go ahead.

You know, now that I think about it, I guess maybe 70 - 80 percent of the time today, I've been able to see the horizon out of the hatch window.

Roger.

Which sort of means maybe it is pulled by gray.

My goodness. Maybe we've come up with something here that will become an international law or something, you know, like F = MA.

Say, now. Wouldn't that be something?

Tremendous.

GOLDSTEIN (KEY 33)

Gumdrop, Houston.

Go ahead Houston.

Roger. We'd like to have FOO and ACCEPT, please. We have a state vector and a target load for you, and you might start fumbling for a maneuver PAD; I'll have one for you when you're ready to copy on EF-5.

Roger. You have FOO and ACCEPT, and we are ready to copy.

Okay. I'll be ready in about one minute.

Okay, Gumdrop, this is Houston with the PAD. Go.

Roger. Reading EF-5: 051 26 1120, minus 5209, minus 03775, plus 03768 05754 65673 0432 30545, plus 119, minus 620 25 17610 23
800, minus 0388, plus 13076 1769. And I'd like to pass the IM weight - is 21660.

Roger. Can you give me the shaft angle again, please?

Roger. Reading the shaft angle: 17610. And under remarks, I have your gimbal angles that will give you 90 degrees cut of plane in case of the early shut down. Reading: roll, all nips; pitch, 040; yaw, 030. End of update.

Roger. Stand by just one on the readback.

Roger. Standing by for the readback, and the computer is yours. You have been loaded a state vector and a target load.

Okay, Buck. Do you have a preferred time on those angles? I realize that they are out of plane all the time, but do you have a preferred time or anything on them?

That's negative, just under the ... in all the ground rules that we had just as soon as possible, once you determined the cause and feel like kicking it off again.

Okay. Here comes the readback: 054 26 1120, minus 02109, minus 03775, plus 03796 03754 03673 032 1054 - ours, course own 30245, plus 110, minus 030 25 17610 03 600, minus 0368, plus 13076 1769. And understand roll 0, pitch 00, yaw 30; we're 90 out of plane, IM weight 21660.

Roger. Houston confirms the update. It looks good.

Thank you.

ASCENSION (REX 34)

Quadrop, this is Houston through Ascension. Standing by.

Roger, Houston. This is Apollo 9 here.
02 05 12 50 CC Roger, Apollo 9.
02 05 12 56 SC We're just getting ready to start the P52.
02 05 12 59 CC Roger. Copy.
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(00893 1 1)

TAMANARIVE (REV 34)

02 05 17 51 CC And we followed that, Apollo 9.
02 05 17 59 CCR Oh, very well. Thank you.
02 05 18 00 CC Roger.

CARNARVON (REV 34)

02 05 35 03 CC Apollo 9, Houston through Carnarvon.
02 05 36 25 CC And, Apollo 9, Houston. We'll see you over Carnarvon at 44.

GUAM (REV 34)

02 05 48 30 CC Apollo 9, Houston. We have you through Carnarvon.
02 05 48 34 CCR Hello, there. Houston, Apollo 9.
02 05 48 37 CC Roger. Loud and clear.
02 05 48 40 CCR Roger. Same with you. We are over Hawaii drifting slowly over towards deep burn attitude.
02 05 48 51 CC Houston, Roger.
02 05 49 59 CC Apollo 9, Houston. You are GO for E73-5.
02 05 49 02 CCR Roger. GO for E73-5.

GUAM (REV 34)

02 05 59 49 CC Apollo 9, Houston through Guam. Standing by.
02 05 59 53 CCR Hello there, Houston through Guam. How are you today?
02 05 59 56 CC Roger. Good shape.
02 06 00 00 CCR It is nice to talk to you in the dry time. You keep waking me up in the morning.
02 06 00 05  CC  It's better for me, too.
02 06 00 12  CDR  I guess somebody must be getting easy down there, right?
02 06 00 17  CC  9, Houston. Say again.
02 06 00 20  CDR  Roger. Whoever is doing the scheduling must be getting easy on you.
02 06 00 27  CC  Yes. Concur.
02 06 01 31  CDR  Houston, Apollo 9. We just completed our daylight star check, and lo and behold, a star was there!
02 06 01 38  CC  Hey, great!
02 06 04 38  CC  Apollo 9, Houston. One minute LOS, Hawaii at 12.
02 06 04 44  CDR  Roger. Hawaii at 12. Okay, Okay.
02 06 05 03  CDR  Hey, Ron, is Sonny there with you?
02 06 05 08  CC  Is who with me?
02 06 05 10  CDR  Oh, never mind. I'll get you over Hawaii.
02 06 05 12  CC  Roger.
02 06 05 15  CC  Sonny is still here.
02 06 05 19  CDR  No; Sonny. Sonny Morton.
02 06 05 23  CC  Yes. He's here, too.
02 06 05 25  CDR  Okay.
02 06 05 30  CC  Hello, Jim.

HAWAII (MNH 34)

02 06 13 49  CC  Apollo 9, Houston through Hawaii. Standing by.
02 06 13 53  CDR  Roger.
02 06 13 54  CC  Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 06 15 54</td>
<td>CC</td>
<td>Apollo 9, Houston. I'll give you a Mark on 10 minutes.</td>
</tr>
<tr>
<td>02 06 15 57</td>
<td>CMR</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 06 16 12</td>
<td>CC</td>
<td>Mark.</td>
</tr>
<tr>
<td>02 06 16 13</td>
<td>CC</td>
<td>10 minutes.</td>
</tr>
<tr>
<td>02 06 16 14</td>
<td>CMR</td>
<td>Roger. We're right together.</td>
</tr>
</tbody>
</table>

**KIDSTON (RIV 34)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 06 27 20</td>
<td>CMF</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>02 06 27 21</td>
<td>CC</td>
<td>Houston. Roger. We copy your residuals. Request DELTA-V_c.</td>
</tr>
<tr>
<td>02 06 27 25</td>
<td>CMF</td>
<td>Roger. DELTA-V_c is 9.9.</td>
</tr>
<tr>
<td>02 06 27 30</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 06 28 20</td>
<td>CMF</td>
<td>Houston, Apollo 9. Did you copy our KA and BP?</td>
</tr>
<tr>
<td>02 06 28 27</td>
<td>CC</td>
<td>Roger. We copy. 129.6, 127.7.</td>
</tr>
<tr>
<td>02 06 28 31</td>
<td>LMF</td>
<td>Okay.</td>
</tr>
<tr>
<td>02 06 28 33</td>
<td>CMR</td>
<td>Hey, that was a pretty burn.</td>
</tr>
<tr>
<td>02 06 28 36</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 06 29 03</td>
<td>CC</td>
<td>Apollo 9, Houston. Request the BATT B charging, as soon as you got to it.</td>
</tr>
<tr>
<td>02 06 29 06</td>
<td>CMF</td>
<td>Roger. In work.</td>
</tr>
<tr>
<td>02 06 29 09</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 06 29 45</td>
<td>CMF</td>
<td>Okay. BATT B on the charge, Houston, and we're drawing two and one-quarter amps on it.</td>
</tr>
<tr>
<td>02 06 29 52</td>
<td>CC</td>
<td>9, Houston. Roger. We copy.</td>
</tr>
<tr>
<td>02 06 30 33</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>02 06 30 35</td>
<td>CMR</td>
<td>Go ahead.</td>
</tr>
</tbody>
</table>
(0288 EXT 1)

02 06 30 36  CC   Roger.  We'll be going private over Antigua in about 30.
02 06 30 41  CDR   Okay ...
02 06 32 42  CC   Apollo 9, Houston.
02 06 32 44  CDR   Go, Houston, Apollo 9.
02 06 32 45  CC   Roger, we see you are in program 6 right now. Just be advised we want to give you a state vector before you power down.
02 06 32 52  CDR   Oh, gracious.
02 06 32 56  CHP   Roger. We'll bring the CM back on the line.
02 06 32 59  CC   Roger.
02 06 33 04  CDR   You're pretty fast.
02 06 33 11  CDR   When it gets close to time to rest, we're really in motion.
02 06 33 17  CC   Say again.
02 06 33 19  CDR   I said when it gets close for - for the time for us to start resting, we really get in motion.
02 06 33 24  CC   I noticed that.
ASCENSION (KEN 35)

--- --- ---
CMC Houston, Apollo 9.
--- --- ---
CC Houston. Go.
--- --- ---
CMC Roger. We've got consumable status for you here.
--- --- ---
CC Roger. Ready to copy.
--- --- ---
CMC Okay. Service module RCS A, B, C, D - Ready to copy.
02 06 51 55 CC Go.
02 06 51 56 CMC 75, 76, 74, 74.
02 06 52 03 CC 75, 76, 74, 74.
02 06 52 07 CMC Roger. BATT C, 37.0; pyro A, 37.1; B, 37.1.
02 06 52 21 CC Roger.
02 06 52 23 CMC We've got the injector temperatures for you: 3 OFF SCALE HIGH, 5 Delta 4.85, 6 Alfa, Bravo, Charlie, and Delta all OFF SCALE HIGH.
02 06 52 41 CC Roger. All OFF SCALE HIGH except 5 Delta, and it's 4.85.
02 06 52 48 CMC That's Charlie - I mean that's affirmative.
02 06 52 52 CC Okay. We show you 129.1 by 123.6. We're refining it but it looks okay.
02 06 53 04 CMC Roger. Do you have any words on purge tonight?
02 06 53 10 CC Say again. Words on a purge?
02 06 53 13 CMC Roger. Do you want us to purge the fuel cells tonight?
02 06 53 19 CC Roger. Stand by.

GUAM (KEN 35)

02 07 32 42 CC Apollo 9, Houston through Guam.
02 07 32 46 CDR Roger. Houston, Apollo 9. Go ahead.
Roger. We're kind of standing by for 6-hand lockup here to get an E memory dump from you.

Oh, very well.

And we never saw a state vector go in.

Roger. It'll be coming in here shortly, soon as they get the lockup.

Okay.

Okay, Apollo 9. Looks like we got it. Request a VARK 74, and give us a Mark when you do it.

Roger. Okay, here we go: 3, 2, 1.

MARK.

Apollo 9, Houston. While we're waiting here, we'd like to have an oral temperature from Rusty, and we recommend that he take one Maresine about an hour before his suiting tomorrow morning.

Roger. Understand.

Apollo 9, Houston. Request FICU and ACCEPT.

Roger. You have FICU and ACCEPT.

Okay. Should be coming up. We need a decimeter readout, too, if you have those handy.

Okay. Stand by. We can give you two out of three.

Okay.

Okay. The CHP's is 16111.

16111.

CHM's is 03111.

03111.

9, Houston. On the first CCM checks we had today, they were recorded real good at the site, and evidently we had just a bit of a problem getting them back to MCC; but the CCM checks were good.
02 07 36 50  CMP  Oh, very good. Okay. What kind of heater/fan configuration would you like tonight on the cryo?

02 07 36 59  CC  Okay. We will give that to you over Texas; probably heaters off and we'll have the fan on. Okay...

02 07 37 08  CMP  Okay. We'll be standing by for your word.

02 07 37 10  CC  Okay. And I've got a KAV check for you if you're ready to copy it.

02 07 37 14  CMP  Stand by.

02 07 37 34  CMP  Okay. Go ahead with the KAV check.

02 07 37 37  CC  Okay. Of course, the purposes for going off the range: GET 056 30 0000, minus 3251, minus 05910 1858. Over.

02 07 38 03  CMP  Roger. 056 30 0000, minus 3251, minus 05910 1858.

02 07 38 13  CC  Roger. It's good, and the computer is yours.

02 07 38 18  CMP  Oh, very well. Thank you.

02 07 39 38  CC  9. Houston. Another thing we came to a conclusion here was that we had to be in high bit rate for the FALGO to AOS initialization.

02 07 38 48  CMP  Roger. Understand.

02 07 38 56  CC  Now, we're just about to L03 here. I'll give you some more dope on tomorrow's activities when we get over Hawaii.

02 07 39 05  CMP  Okay, understand.

02 07 39 06  CC  And you might be thinking about if there's any changes in the window fogging from yesterday.

02 07 39 13  CMP  Roger. Today the left-hand rendezvous window was fogging a little more around the edges. It looks like it'll be okay through rendezvous, but it's...

HAWAII (KEY 35)

02 07 47 03  CC  Apollo 9, Houston through Hawaii.
Roger, Houston, Apollo 13.

Okay. I missed your comment on the windows there as you went over the hill.

Okay. The windows are looking pretty good. All of them are just fine as a matter of fact, except the left-hand rendezvous window. And the film that we had yesterday is continuing to grow, the little light band around the edges. It'll be fine for the rendezvous but interesting to see how long it lasts on into the 10 days. Let's see, only one of the bunch, really, that looks like it has a problem. The little circle that was in the center of the hatch window hasn't seemed to grow any. And the rest of them are remaining about the same, pretty good.

Okay.

And the temperature is about 96.6.

Roger, 96.6. Okay. I've got a few comments on tomorrow's timelines if you're ready to copy and listen, there, I guess.

Okay. Just a second.

Okay. Basically what we've planned is to stay on the normal timeline for both vehicles up to the point of going EVA. And when we get into the FLMS things there, we'll go through the normal FLMS hatch, but stay on the LM EVA hatches in suit disconnect from the LM, instead of connecting the OMS.

Okay.

Okay. We want to keep the TV pass as scheduled, and it's kind of a dealer's choice there, shots inside the LM, the tunnel, or whatever you want.

Okay.

Okay. Do you have any druthers on the FLMS COS?? We're thinking that maybe you - going ahead and use the IM relay mode.

All right. Stand by.

9, Houston.
02 07 50 45  CPR  Roger. Go ahead.
02 07 50 51  CPR  Houston, 9. Go ahead.
02 07 50 52  CC  Roger. We're curious. Did Rusty take a Maresine and a Lomotil this morning?
02 07 51 04  CPR  That's affirmative.
02 07 51 06  CC  Roger.
02 07 51 11  CPR  We're massaging your plan right now.
02 07 51 14  CC  Okay.
02 07 51 20  CC  9, this is Dake. Do you read?
02 07 51 23  CPR  Say again.
02 07 51 24  CC  Dake here. How do you read?
02 07 51 26  CPR  Stand by one, Dake.
02 07 51 28  CC  Okay.
02 07 52 04  CPR  Okay. Go ahead.
02 07 52 06  CC  Roger. I think we had LOS on you before we finished our last transmission. I thought I'd let you know that everybody down here is very happy with the way the day has gone, and I'd like to congratulate you for an outstanding job.
02 07 52 16  CPR  Thank you.

GOLDSTONE (REV 35)

02 07 53 29  CC  Apollo 9, Houston.
02 07 53 31  CDR  Roger, Houston. Go ahead.
02 07 53 33  CC  Roger. I think we might add a little bit to what we were saying about tomorrow, and that is that we intend to just have the hatch open only during the first daylight pass and then button it up.
02 07 53 48  CDR  Roger. Fading out. We haven't got a solid lock I don't think, yet. Would you say it once more, please?
Okay. How are we now?

Okay. I think you're coming in better now.

I might add that we plan to have the hatch open only during the first daylight pass and then button it up rather than going all the way around with the hatch open.

Roger. Yes, I'd like to finish up tomorrow's activities a little earlier, if we can.

We understand that.

Okay. We only have a 7-1/2-hour rest period tomorrow night, and I want to make sure that we have enough time to configure the spacecraft for the transfer the next day and still get some sleep.

Concur.

It looks like we're going to have to open the hatch at normal time, leave it open for that daylight pass, close it, configure it for the TV, and when the TV is over then we would leave the LM, come back in the command module. Is that right?

That's right, and as a matter of fact, we don't even want the TV to interrupt the transfer. If possible you can, you know, start the transfer early.

Oh, okay. I see what you're saying that we plan to follow normal timeline and then we got to the time to open the hatch, as we do that, leave them open during the first daylight pass, close them up, and then we de-press the LM and tune in the TV on the way out, sort of.

Something like that, yes.

Yes. That sounds like a pretty reasonable plan.

And, 9, Houston. While we've got a little bit of COMM here, I've got some block data number 7 for you.
Okay. We'll tidy up the pad here. One thing that we - you might take under advisement is be prepared for us to be a little bit late in the morning because it's really a scramble trying to get suited, and once you get suited you become all tangled up in these hoses, so we have to take a little - it takes a little bit longer, I guess, in the morning than we really have allotted in our flight plan. So we may be just a little late getting over there.

Okay. We understand.

I think once we get to the LM, we find that we worked that through enough and there's not that much jumping around that requires to take too much longer than nominal.

Okay.

Okay. Go ahead with your block data.

TEXAS (RMV 36)

Houston, go ahead with the block data, we're ready.

9, Houston. One more thing here. We plan to turn Hg tank 1 fan on at 56 plus 00.

Say again the time, please.

At 56 plus 00.

Hg fan 1 on at 55 plus 00.

Roger. And how about 2-band volume up at 56 plus 22. We'll try an 2-band AMIA pass.

Okay. 2-band volume ... 

Okay. Now we're ready for block data.

Okay. Go ahead.

Area 009 3 Alfa, plus 273, plus 1450 061 35 08 4355; 040 Alfa Charlie, minus 091, minus 0120 062 29 34 4355; 041 Alfa Charlie, minus 008, minus 0230 064 02 26 4355; 042 Alfa Charlie, plus 009, minus 0320 065 35 55 4355. Still with me, 91.
02 07 59 22  CCR  Roger.  Press on.
02 07 59 24  CC  O43 2 Alfa, plus 247, minus 0270 067 22 51 4355, O44 Alfa Charlie, plus 313 0 - delay that - minus 4355.  And 9, your EFO times: pitch, minus 0.9, yaw, minus 1.1.  Houston, over.
02 08 00 38  CCR  Roger.  I didn't know EFO had so many areas.
02 08 00 41  CC  Yes, he's got a bunch of them.
02 08 00 46  CCR  Okay.  I guess we start at 039 3 Alfa, right?
02 08 00 50  CC  Affirmative.
02 08 00 52  CCR  Plus 273, plus 1450 061 35 08 4355, O40 Alfa Charlie, minus 091, minus 0120 032 09 34 4355, O41 Alfa Charlie, minus 003, minus 0230 068 02 76 4355, O42 Alfa Charlie, plus 090, minus 0350 043 35 55 4355, O43 2 Alfa, plus 247, minus 0270 067 22 51 4355, O44 Alfa Charlie, plus 313, minus 0290 066 46 22 4355.
02 08 02 04  CC  9, Houston.  Your readback is correct.  And request you verify CO2 canister change there a while back.
02 08 02 11  CCR  That's verified, on time.
02 08 02 13  CC  Roger.
02 08 02 15  CCR  Houston, Apollo 9.
02 08 02 18  CC  Houston, here.
02 08 02 19  CCR  Do you have any good information on why our rendezvous radar data wasn't getting into the computer?
02 08 02 25  CC  We've got the bixelsas moving it over 4km here, and we haven't come up with a real good answer yet.
02 08 02 33  CCR  Okay.  Did you get any good downlink data from those checks that we did?
02 08 02 39  CC  Say again.
02 08 02 42  CCR  Did you get any downlink data from the rendezvous radar checks that we did?
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 08 02 49</td>
<td>CC</td>
<td>That's affirmative. We did get some data.</td>
</tr>
<tr>
<td>02 08 02 52</td>
<td>CEM</td>
<td>Okay. So you have the data to look at, too.</td>
</tr>
<tr>
<td>02 08 02 53</td>
<td>CC</td>
<td>Yes.</td>
</tr>
<tr>
<td>02 08 02 56</td>
<td>CEM</td>
<td>Alrighty. We'll be standing by anxiously to find out what your conclusion is.</td>
</tr>
<tr>
<td>02 08 03 00</td>
<td>CC</td>
<td>Okay. And the computer is yours; you can go to BLOCK on the computer.</td>
</tr>
<tr>
<td>02 08 03 03</td>
<td>CEM</td>
<td>Okay. And it's already put to bed.</td>
</tr>
<tr>
<td>02 08 03 13</td>
<td>CEM</td>
<td>Say, Houston. Say, we've got H₂ heaters OFF now and O₂ heaters ON.</td>
</tr>
<tr>
<td>02 08 03 21</td>
<td>CC</td>
<td>Say again, Dave.</td>
</tr>
<tr>
<td>02 08 04 09</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>02 08 04 42</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
</tbody>
</table>
Apollo 9, Houston.
Apollo 9, Houston.
Apollo 9, Houston through ARIA.
ARI A 5, Houston CAP COMM. Let's try VHF uplink and downlink.
Apollo 9, Houston through ARIA.
Roger. We are VHF at this time. I tried you on S-band. Did you hear me at all?
Negative. We didn't hear you on S-band, and I've got it turned up.
Okay. Evidently the S-band didn't work. Let's go ahead and keep the VHF here. We will try S-band at the end of the pass again. Got some good dope for you on the rendezvous radar DSKY test.
Stand by a minute.
Okay, Houston. Go ahead.
Roger. The downlink shows that the rendezvous radar self-test is okay, and in checking it out a little bit more, the self-test doesn't show up on the DSKY because the antenna is in the STORED position.
Okay. Understand, Houston. Downlink shows that the RR self-test is okay, and the reason that it didn't show up on the DSKY was because it was in the STORED position.
That is affirmative. We've gimmied up a procedure so that you could look at it on a DSKY. However, since it was good on the downlink, rather than mess around with a new procedure, we'll probably go ahead - we'd like to go ahead and say it works, and try it out on rendezvous day.
Okay. Understand.
<table>
<thead>
<tr>
<th>Time</th>
<th>Origin</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 08 28 31</td>
<td>CMP</td>
<td>Stand by one, Houston.</td>
</tr>
<tr>
<td>02 08 28 33</td>
<td>CC</td>
<td>Houston. Go.</td>
</tr>
<tr>
<td>02 08 28 37</td>
<td>CMP</td>
<td>Stand by one, Houston.</td>
</tr>
<tr>
<td>02 08 29 11</td>
<td>CMP</td>
<td>Houston, Go.</td>
</tr>
<tr>
<td>02 08 29 13</td>
<td>CC</td>
<td>Houston. Go.</td>
</tr>
<tr>
<td>02 08 29 15</td>
<td>CMP</td>
<td>Okay. How about whipping those procedures into reasonable form? And, if there is time tomorrow, I guess we would like to look at that, and perhaps even stow it - just to get the feeling on board. Okay!</td>
</tr>
<tr>
<td>02 08 29 30</td>
<td>CC</td>
<td>Okay. We can do that for you; and we will have it for you tomorrow.</td>
</tr>
<tr>
<td>02 08 29 34</td>
<td>CMP</td>
<td>Okay. Very well. Thank you.</td>
</tr>
<tr>
<td>02 08 29 46</td>
<td>CC</td>
<td>Okay. That was the USB we're talking on here. It looks like we are about 108, and talk is not too good over Tanarive. So, if you don't hear from us, have a good night's sleep.</td>
</tr>
<tr>
<td>02 08 29 58</td>
<td>CMP</td>
<td>Okay. Thank you very much. We'll see you in the morning.</td>
</tr>
<tr>
<td>02 08 30 02</td>
<td>CC</td>
<td>Roger.</td>
</tr>
</tbody>
</table>

END OF TAPE
APOLLO 9 AIR-GROUND VOICE TRANSCRIPTION

KEEP PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(0038 0611 1)

Keep Period - No Communications
APOLLO 9 AIR-TO-GROUNDS VOICE TRANSCRIPTION

(C068 NET 1)
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(MERCURY (REV 42))

02 18 54 23 CC Good morning, Apollo 9, Houston.
02 18 54 36 CDR Morning.
02 18 54 40 CSP Morning.
02 18 54 42 CC Roger. Comes mighty early doesn't it?
02 18 54 44 CDR Oh, yes. It's still dark outside, too.
02 18 54 49 CC Hey, that's right.
02 18 55 02 CC 9, Houston. We've got quite a few things to pass up to you here this morning before we get started.
02 18 55 10 CSP Okay. How about it?
02 18 55 11 CC Okay. First of all, MATT B is charged, so you can terminate MATT B charge.
02 18 55 19 CSP Okay. Terminating B at this time.
02 18 55 21 CC Okay. On your H₂ tanks: we like tank 1 heater OFF, and tank 2 heater OFF. Let me relay that: tank 2 heater in AUTO.
02 18 55 42 CSP Okay. Tank 1 heater is OFF, and tank 2 heater is in AUTO.
02 18 55 47 CC Okay. And, of course, the fans are OFF. H₂ fans are OFF.
02 18 55 51 CSP Roger. Both H₂ fans to OFF.
02 18 55 55 CC Okay. I have a consumables update whenever you want it, and then I can go through some stuff on the EVA.
02 18 56 06 CSP Okay. Stand by.
02 18 56 32 CSP Okay, Houston. Go ahead with the consumables.
02 18 56 35 CC Okay. GST: 067 70 23 69 76 30 70 20 435 40 38 36 39 100 97 61 1019 563. Over.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>0219 22 35</td>
<td>CC</td>
<td>Apollo 9, Houston through Antigua.</td>
</tr>
<tr>
<td>0219 22 38</td>
<td>CGP</td>
<td>Roger. Houston, Apollo 9. How do you read?</td>
</tr>
<tr>
<td>0219 22 40</td>
<td>CC</td>
<td>Roger. Loud and clear, Dave.</td>
</tr>
<tr>
<td>0219 22 42</td>
<td>CGP</td>
<td>Okay. Here's your readback on the consumables. Ready?</td>
</tr>
<tr>
<td>0219 22 45</td>
<td>CC</td>
<td>Go.</td>
</tr>
<tr>
<td>0219 22 47</td>
<td>CGP</td>
<td>067 70 23 69 49 76 30 30 485 48 38 36 39 100 97 41 1019, and I didn't catch the last one.</td>
</tr>
<tr>
<td>0219 23 16</td>
<td>CC</td>
<td>Roger. 588.</td>
</tr>
<tr>
<td>0219 23 20</td>
<td>CGP</td>
<td>588.</td>
</tr>
<tr>
<td>0219 23 21</td>
<td>CC</td>
<td>And, Dave, we've got a bunch of things here to change in the EVA checklist, there. That I would suggest is that you dig out the EVA checklist, and also we want to add pages 17-18 and -33 of your systems checklist in there.</td>
</tr>
<tr>
<td>0219 23 39</td>
<td>CGP</td>
<td>Okay. Stand by. Which spacecraft?</td>
</tr>
<tr>
<td>0219 23 42</td>
<td>CC</td>
<td>LM spacecraft.</td>
</tr>
<tr>
<td>0219 23 43</td>
<td>CGP</td>
<td>For the LM. Okay. Stand by.</td>
</tr>
<tr>
<td>0219 24 09</td>
<td>CGP</td>
<td>Okay, Houston. Go ahead with the EVA checklist updates.</td>
</tr>
<tr>
<td>0219 24 15</td>
<td>CC</td>
<td>Okay. Place page systems-17 after EVA-15, and systems-32 and -33 after EVA-19.</td>
</tr>
<tr>
<td>0219 24 34</td>
<td>CGP</td>
<td>That's okay. I wasn't expecting any kind of an update. Go ahead, what's the next one? Systems-17 after EVA-15, what's next?</td>
</tr>
<tr>
<td>0219 24 41</td>
<td>CC</td>
<td>Systems-32 and -33 after EVA-19.</td>
</tr>
<tr>
<td>0219 25 03</td>
<td>CC</td>
<td>Okay. Page EVA-17.</td>
</tr>
<tr>
<td>0219 25 08</td>
<td>CGP</td>
<td>What other updates did you have?</td>
</tr>
</tbody>
</table>
Okay. What I was going to try to do - If you've got the checklist in front of you, I'll read it through here and let you mark them in the checklist as we go. We've got about 20 minutes or until 40, with a couple of minutes in between logged.

9. Houston. Are you with me again?

Roger. With you.

Okay. We've got a lot of things here, Dave, if you want me to read it up and you copy it down, or else we'll just make the changes as we go right through the checklist.

Go ahead. I've got the systems-17 after EVA-15, systems-32 and -33 after EVA-19.

Okay. On page EVA-17: delete the rendezvous radar antenna positioning.

Okay. EVA-17 - What do you want to do?

Delete the rendezvous radar antenna positioning.

Roger. It's deleted.

Okay. And EVA-17, the EVA prep: delete step 3 and step 4, lines 2 and 3.

Okay. That's the entire step 3: in step 4, just lines 2 and 3.

Okay. You want us to delete all of step 3, and you want us to eliminate steps 2 and 3 of step 4.

Affirmative. Lines 2 and 3 of step 4.

Roger.
Okay. On RVA-18 and -19: delete the PLLS COMM check.

Okay. PLLS COMM check.

Okay. CV systems-32 - -

I'll have to write that down.

Perform at 71 plus 14 over Carnarvon.


And on Systems-33: perform at 71 plus 33 over Mercury.

Roger. Systems-33 at 71:33 over Mercury.

Okay. Systems-33 in the lunar stage backup with relay: delete step 3 and add return to LMM basic with LM two-way relay by setting RANG to RANG, VOICE to VOICE. PLLS mode 3, then COMM check with MENH. PLLS mode 3, at 3 and UTA dump.

You got away from me, Ron. You want to do the lunar stage backup with relay; then you want to delete step 3; then you want to return to LM basic. Then you want to go to two-way relay?

That's right. Return to LM basic with two-way relay.

Okay. I don't have that system worked out right now, and I can't make no change. What else did you say after that? Just say it again fast, and I'll see if I have to write it down.

Okay. You return to two-way relay by setting RANG to RANG, VOICE to VOICE. PLLS mode 3, then COMM checks with MENH. Then PLLS mode 3, and then you have your rest and eat period.

Okay. Let me see if I can decipher my writing here. You want a lunar stage backup with relay and then delete step 3. Return to LM basic with two-way relay by going RANG to RANG, VOICE to
VOICE: Turn go to MLG mode 5, make an MLG voice check, then return to mode 3 and reset and start.

02 19 31 49 CC Affirmative. Okay, while I think about it, 8-band volume up at 36. Okay. Let's go to EVA page 20.

02 19 32 02 CMP Okay. Go ahead.

02 19 32 04 CC Okay. In the final prep, step 3: delete lines 2, 9, 10, 11, and 12.

02 19 32 35 CMP Okay. Delete 2, 9, 10, 11, and 12.

02 19 32 30 CC Okay. Go EVA-82, LM FGA check.

02 19 32 32 CMP Go.

02 19 32 34 CC On step 1: delete lines 1 and 4 through 7.

02 19 33 10 CMP Do you have the checklist there?

02 19 33 12 CC Yes.

02 19 33 14 CMP What's the first line? CM-16 EVA suit flow control?

02 19 33 17 CC Affirmative. Delete that.

02 19 33 23 CMP Okay. And what else?

02 19 33 24 CC Okay. Disconnect LCP O2 hoses, and then all the way down to installing the oxygen purge valve. Delete that.

02 19 33 39 CMP Okay.

02 19 33 43 CC Okay. Your first sunrise time is 73 plus 07.

02 19 33 55 CMP Okay.

02 19 33 56 CC Okay. On EVA-81, just scratch it starting at the first sunrise.

02 19 34 16 CMP Okay. You want to scratch everything on first sunrise.

02 19 34 20 CC All the way through EVA-83. Okay. Go to the top of EVA-84.
<table>
<thead>
<tr>
<th>Time</th>
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</tr>
</thead>
<tbody>
<tr>
<td>02 00 34 41</td>
<td>CCR  Okay. Go ahead.</td>
</tr>
<tr>
<td>02 00 34 43</td>
<td>CC   Change plus 207 to plus 35.</td>
</tr>
<tr>
<td>02 00 34 55</td>
<td>CCR  Okay. Plus 35.</td>
</tr>
<tr>
<td>02 00 34 57</td>
<td>CC   Delete lines 1, 2, 3, and 6.</td>
</tr>
<tr>
<td>02 00 35 03</td>
<td>CCR  Of the 207 step?</td>
</tr>
<tr>
<td>02 00 35 07</td>
<td>CC   Okay. On the change --</td>
</tr>
<tr>
<td>02 00 35 08</td>
<td>CCR  Do you want me to delete lines 1, 2, 3, and 6 of the 207?</td>
</tr>
<tr>
<td>02 00 35 14</td>
<td>CC   That's affirmative. Okay. On the plus 215 - or change plus 215 to plus 40.</td>
</tr>
<tr>
<td>02 00 35 32</td>
<td>CCR  Okay. Plus 40.</td>
</tr>
<tr>
<td>02 00 35 34</td>
<td>CC   Delete lines 1, 2, and 4.</td>
</tr>
<tr>
<td>02 00 35 42</td>
<td>CCR  Okay.</td>
</tr>
<tr>
<td>02 00 35 47</td>
<td>CC   Okay. After - on down in there - after FLGS 02 OFF, it's about line 15.</td>
</tr>
<tr>
<td>02 00 35 53</td>
<td>CCR  - FLGS 02 OFF, and then what?</td>
</tr>
<tr>
<td>02 00 35 57</td>
<td>CC   Add: LFS suit isolation to suit flow and FLGS pump and fan both OFF. Delete the two lines that are concerning the suit purge valve to depress the suit.</td>
</tr>
</tbody>
</table>

**MADRID (KEY 43)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 00 36 42</td>
<td>CC   Apollo 9, Houston.</td>
</tr>
<tr>
<td>02 00 36 52</td>
<td>CC   Apollo 9, Houston.</td>
</tr>
<tr>
<td>02 00 36 59</td>
<td>CC   Apollo 9, Houston through Madrid.</td>
</tr>
<tr>
<td>02 00 37 15</td>
<td>CC   Apollo 9, Houston through Madrid.</td>
</tr>
<tr>
<td>02 00 37 39</td>
<td>CC   Apollo 9, Houston.</td>
</tr>
<tr>
<td>02 00 37 53</td>
<td>CC   Apollo 9, Houston.</td>
</tr>
<tr>
<td>02 00 38 16</td>
<td>CC   Apollo 9, Houston.</td>
</tr>
</tbody>
</table>
Apollo 9, Houston. 

Apollo 9, Houston. I'll transmit in the blind.

CARNARVON (REX 43)

Apollo 9, Houston through Carnarvon.

02 20 03 04 CC Okay. Are you ready to go with a little bit more there?

02 20 03 12 GCP Roger.

02 20 03 13 CC Okay. On EVA-25, step 3: delete lines 2 and 3; step 4: delete line 1.

02 20 03 27 GCP Roger.

02 20 03 28 CC And add LCP suit isolation to suit disconnect. Okay. Then just execute with your post EVA procedures.

02 20 06 42 CC Okay. You might want to write some of these things down. These are in the terms of flight plan update.

02 20 09 05 GCP Okay. Are these going to be in the EVA checklist now, or is the flight plan, Don?

02 20 09 12 CC Well, it's kind of both, but I'll give you a time, and you can convert them into your EVA checklist there. In fact, we're going to power the LM down a little bit early. That will give you time on a TV pass.
Okay. Stand by here. Let me get something to copy these on.

Okay. Go ahead, Ron.

Okay. At 74 plus 57, close primary TVAP flow. And start your LM powerdown.

Close the primary TVAP flow.

Okay. Start TV pass at 74 plus 57 through 73 plus 13.

Understand. TV pass 74 plus 57 through 73 plus 13. Now let me copy that down here.

Okay. Go ahead.

Okay. While you're going that, Jim, he can start his transfer back through the tunnel at this time if you want to. Okay. While I'm thinking about it, B-band up at 14 for Honeysuckle.

Okay.

Okay. We want LMP remain on LM CCM to perform B-band backup voice check, mode 4, over Ascension at 73 plus 25.

Okay. 73 plus 25 over the Ascension pass you want the LMP on the LM CCM to perform a voice backup check.

Affirmative, B-band voice backup mode 4.

Honeysuckle (Rev 43)

Apollo 9, Houston through Honeysuckle.

Apollo 9, Houston through Honeysuckle.

Okay, Houston. We got you again out here somewhere.

Okay, Dave. What we said so far looks like the major changes. Of course, there may be a lot of optional changes in there in which you may or may not want to do—such as configuring the
emerges, EVA gloves and moving the IM and a few other things that are -

Roger. This is Rusty. We'll try to figure that out as we go along on any of those. Hey, I've got one thing I would like to check with you before we start the IM operation again, and that was on the - Something happened yesterday we neglected to report, and I'd like to get a check on it.

Okay. Go.

Okay. During the cabin closeout - and I can't find the systems checklist right at the moment, but one of the last steps in the cabin closeout when we are powering down the ECS, one of the steps there is cabin repress from AUTO to CLOSE. And when I moved the valve from AUTO to CLOSE we got a great big, loud bang; and I immediately went back to AUTO and then recalled that IM 4 had had a problem like that in the chamber. And I think the word was that it came out okay, so I went to CLOSE, and as I went from AUTO to CLOSE it went bang again and then stopped. But I'd like to get confirmation on that. But is that the normal behavior of the valve?

Okay. We'll check it for you.

Okay, Dave. Got a few comments on your part of the EVA.

Okay. Stand by. He's not on the IM just now.

Okay.

Houston. What it looks like here we can go ahead and initiate a command module powerdown at 76 plus 55.

Command module powerdown at 76 plus 55.

Roger. That'll give you an extra hour tonight for a rest.

Thanks.

How about that?

We'll take it.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 20 18 22</td>
<td>CC</td>
<td>Have you on?</td>
</tr>
<tr>
<td>02 20 18 24</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 20 18 30</td>
<td>CC</td>
<td>Okay. Your EVA checklist is essentially the same. Go on up through opening the hatch. Now, when you open the command module hatch, if you think you can retrieve that thermal sample by the hatch, do so. You know, if it looks like it's easy to reach and you can pull it back in there without crawling all the way out. But use your own judgment and whatever you think if you can get it back in.</td>
</tr>
<tr>
<td>02 20 18 57</td>
<td>CMP</td>
<td>Okay. We've gone through all that and told Houston the position ... with everything and I think I'll probably be able to do it, but I'm not going to stretch the hose at all, so we'll just take a look in real time to see what it seems like we can do.</td>
</tr>
<tr>
<td>02 20 19 10</td>
<td>CC</td>
<td>Okay. Great. And your hatch closing will be at 73 plus 40.</td>
</tr>
<tr>
<td>02 20 19 18</td>
<td>CMP</td>
<td>73 plus 40. Okay.</td>
</tr>
<tr>
<td>02 20 19 21</td>
<td>CC</td>
<td>Roger. Your CSM plan will be your CSM basic SQUELX A receive B data except when the LMP is on the PLSS. When he's on there, you can figure SQUELX A receive A only.</td>
</tr>
<tr>
<td>02 20 19 40</td>
<td>CMP</td>
<td>Okay. Understand SQUELX A - B data until we get on the PLSS and then SQUELX A receive A only.</td>
</tr>
<tr>
<td>02 20 19 46</td>
<td>CC</td>
<td>Roger. And then you return back to basic again when he goes off the PLSS.</td>
</tr>
<tr>
<td>02 20 19 51</td>
<td>CMP</td>
<td>Roger. Understand.</td>
</tr>
<tr>
<td>02 20 20 10</td>
<td>CC</td>
<td>9, Houston. Initial look at that valve looks like that's a normal condition that goes bang when you go from AUTO to CLOSE, and we'll just watch checking on it.</td>
</tr>
<tr>
<td>02 20 20 20</td>
<td>LMP</td>
<td>Okay. It sure increased the heart rate yesterday.</td>
</tr>
<tr>
<td>02 20 20 23</td>
<td>CC</td>
<td>Roger. Understand. That's built in there to keep you alert, Rusty.</td>
</tr>
<tr>
<td>02 20 20 33</td>
<td>CC</td>
<td>9, Houston. We'll pick you up Mercury at 25, and I'll have some block data for you at that time.</td>
</tr>
</tbody>
</table>
02 20 31 21 CC The way you're reading them is fine. Just keep pressing.

02 20 31 25 LMP 471 Bravo, plus 33.1, minus 62.0 734028 435.4; 461 Alpha, plus 28.8, minus 64.0 744029 435.4; 496 Bravo, plus 32.0, minus 161.9 774030 435.4; 54 Bravo, plus 33.7, minus 162.0 791413 435.4. Pitch trim minus 1.07; yaw minus --

02 20 32 17 CC Okay. I believe we lost you. We'll see you at Antigua at 52 if you can read me, and that was a good job. You were racing the clock.

ANTIGUA (REV 14)

02 20 53 38 CC Apollo 9, this is Houston through Antigua. Standing by.

02 20 54 05 CDR Okay, Houston. Apollo 9 here. We're purging the three fuel cells with O₂.

02 20 54 13 CC Roger. Understand.

02 20 54 24 LMP And, Houston, did you get the readback on all the block data?

02 20 54 27 CC That was a beautiful job, Rusty. I got everything except the very last item. I'd like to verify the yaw trim as minus 1.11.

02 20 54 37 LMP Roger. Minus 1.11.

02 20 54 45 LMP Say, Houston, we have another question for you here. Looking over the day, we've come to the conclusion that there's no necessity for powering up the EUU and doing an alignment here in the command module. That way we can avoid using any fuel and playing Mickey Mouse with gimbal look every 10 minutes. We'd like to know if you agree?

02 20 55 09 CC Roger. We copy. Stand by one.

02 20 57 51 CC Apollo 9, Houston.

02 20 57 56 LMP Go ahead.

02 20 57 58 CC Roger. That sounds like a pretty sterling idea. I guess - Is your plan to manually point it in
about the right attitude via the sun and then go to a SCS hold there?

02 20 58 12  LMP

Well, we didn't see any particular need for anything other than drifting flight today since we won't be taking the EVA photographs.

02 20 58 21  CC

Okay. We're kicking this around, and we'll have some more info for you. The consideration here, Rusty, is the sun shafting on the command module hatch.

02 20 58 34  LMP

I got you. Okay. We'll think about that one, too. Thank you.

02 20 58 37  CC

Roger.

02 21 02 32  LMP

Houston, are you still with us?

02 21 02 37  CC

That's affirmative, Apollo 9. We're going to have you here for awhile.
APOLLO 9 AIR-TO-GROUND TRANSCRIPTION

(GOSB NET 1)  

MADRID (EKB 44)

02 21 02 40 LMF  Okay, Dave. We were just talking this over, Stu, and Dave says that if there is any constraint on the inside of the spacecraft - that is - not the sun on the hatch, evidently there's none there, but if there's a constraint with the sun coming in impinging on the internal part of the spacecraft, be can maneuver manually to keep - to get the sun out of the way, release the EAGS and attitude hold using SPS there, the two quads, MAX deadband, low rate.

02 21 03 28 CC  Roger, Apollo 9. We copy that. And that's probably what we're going to come up with. You know, we had those discussions about doing drift and flying and covering up the instrument panel, and so forth. But this sounds like a good approach, and that's probably what we're going to arrive at.

02 21 03 36 CHP  Okay. We're favorable to that.

02 21 03 38 CC  Okay.

02 21 03 56 CC  And I'll have you here for about another 10 minutes. And you can go ahead and bring up your 2-band volume if you want. We'll be handing over to Madrid later on in this pass.

02 21 04 01 CHP  Okay.

02 21 05 24 CC  Apollo 9, Houston.

02 21 05 26 CDR  Go ahead.

02 21 05 28 CC  Roger. Another change here. We'd like to have the LTV ON from the time you start the EPS activation and checkout on EVA-6, and leave it on through your suit fan and water separation check on EVA-11.

02 21 05 31 CDR  Okay. LTV ON EVA-6, and OFF on EVA-11.

02 21 05 55 CC  That's affirmative.

02 21 07 01 CHP  Houston, Apollo 9.

02 21 07 03 CC  Go, Apollo 9.

02 21 07 06 CHP  Roger. Do you want that LTV OFF prior to the 2-band and VHF activation, or following it on EVA-11?
(GOS 11)  
02 21 07 20  CC  Roger. You mean systems or EVA-11? 
02 21 07 25  CHP  Whoops. Stand by. Wrong book. 
02 21 07 33  CC  We'd like to have it ON through the suit fan water separation - separator check on EVA-11. 
02 21 07 42  CHP  Roger. Stand by one. 
02 21 07 43  CC  Roger. 
02 21 12 30  CC  Apollo 9, this is Houston. We're going to lose you here at Madrid in about another minute. We'll see you over Carnarvon at 39. 
02 21 12 38  CHP  Roger. Carnarvon at 39. 

CARNARVON (REV 44)  
02 21 39 45  CC  Apollo 9, this is Houston through Carnarvon. Standing by. 
02 21 39 49  CDR  Roger, Houston. This is Apollo 9. And we are running way late again, so we're going to be scrambling to get caught up. 
02 21 39 56  CC  Roger. Understand. 
02 21 46 23  CC  Apollo 9, Houston. We're going to drop you; we'll pick you up Honeysuckle in about a minute with the S-band volume up, please. 
02 21 46 30  CDR  Okay. 

MERCURY (REV 44)  
02 22 00 58  CC  And, Apollo 9, Houston. Don't bother to answer. We've got you through the Mercury for about the next 6 minutes. 
02 22 01 04  CDR  Okay. 
02 22 06 23  CC  Apollo 9, Houston. We'll see you over Texas at 22.
02 22 22 45  CC  Apollo 9, this is Houston through Texas. Standing by.
02 22 23 26  CC  Apollo 9, this is Houston. Could you give us high hit in the Spider?
02 22 23 51  CC  Apollo 9, Houston. How do you read?
02 22 24 21  CC  Apollo 9, Houston. Do you read?
02 22 24 25  CDR  Roger. Apollo 9 reading you, Houston.
02 22 24 28  CC  Roger. We'd like to have high hit rate in Spider, please.
02 22 24 31  CDR (GUMDROP)  Okay.
02 22 24 36  CDR (GUMDROP)  Stand by. We're reconfiguring the CCM right now. We're on EVA-12 if you wonder where we are.
02 22 24 40  CC  Thank you very much.
02 22 24 44  CDR (GUMDROP)  Say, this - It really takes a long time to get ready to start clearing the tunnel. Once we get work done on the tunnel, everything goes pretty fast, but up until then it sure takes a long time.
02 22 24 54  CC  Roger. Copy that. I think we need to talk about that in preparation for tomorrow, sometime today.
02 22 25 00  CDR (GUMDROP)  Roger. That's why I'm telling you now. We've got to get another plan. We have to get up earlier, and we also have to do a lot more reconfiguring at night. I cannot run too long ... I do that.
02 22 25 16  CDP (GUMDROP)  We started configuring the tunnel today 5 minutes late.
02 22 25 20  LMP (SPIDER)  Gumdop, Spider. How do you read?
02 22 25 23  CDP (GUMDROP)  Spider, Gumdop. Five-by.
02 22 25 25  LMP (SPIDER)  Roger. We're supposed to be on A, shall I switch it to B and see if you are receiving me there?
02 22 25 29  CDP (GUMDROP)  Okay. How about B?
Okay, Gumdrop. Spider on A.

Roger. We're ready to proceed, Commander.

Roger.

They would like to have you go to bit rate high, please.

Roger. High bit rate.

Okay. And VHF B transmitter to DATA and VHF B receiver off.

Roger. Go.

This one a VHF antenna check here?

Okay. That's still set up from yesterday, okay?

Okay.

You can turn the tape off.

Roger. Tape off.

That's affirmative, isn't it.

Affirmative.

Okay. Let me send a few other things over there with you, and then we'll be all set.

I tell you what, how about getting me off - the Commander off these hoses and get them back through and then send them back over. I can't move here.

Okay.
02 22 26 59  CDR  Do you want to turn my suit flow off?
(GUMDROP)
02 22 27 15  CDP  Okay. You can pull them back through.
(GUMDROP)
02 22 27 17  CDR  Okay.
(GUMDROP)
02 22 27 31  CDR  Houston, this is Apollo 9.
(GUMDROP)
02 22 27 33  CC  Go ahead, Apollo 9. This is Houston.
02 22 27 36  CDR  We haven't got the water chlorinated this morning.
(GUMDROP) ...
02 22 28 06  CDR  Key, Rusty. I'm going to go of the CCM here,
(GUMDROP) and I'll be over there in a minute.
02 22 28 10  LMP  Okay.
(SPIDER)
02 22 32 06  LMP  Houston, Spider.
(SPIDER)
02 22 32 10  CC  Spider, this is Houston.
02 22 32 13  LMP  Roger. One of the things we noticed yesterday was
(SPIDER) the window heaters get the windows very hot, and we're going to have the shades up for a good part of the day. I wonder if we could have clearance to shut those window heaters off?
02 22 32 33  CC  Roger, Spider. We understand that. You can go ahead and turn them off.
02 22 32 40  LMP  Roger. Thank you.
(SPIDER)
02 22 33 04  LMP  Okay. We have got the three window heaters off.
(SPIDER)
02 22 33 08  CC  Roger. Copy. Three window heaters off.

END OF TAPE
(0933 NET 1)

02 22 38 08 CMP (GUMDROP) Five-by, Spider.
02 22 38 09 LMP (SPIDER) Again.
02 22 38 10 LMP (SPIDER) Five-by again.
02 22 38 11 LMP (SPIDER) Again.
02 22 38 13 CMP (GUMDROP) One more five-by.
02 22 38 16 LMP (SPIDER) Okay. Fine. Thank you.
02 22 38 18 CMP (GUMDROP) Okay. You have got your normal squeal, but other than that it's pretty good.
02 22 38 25 CDR (SPIDER) Is mine still on and running?
02 22 38 27 CMP (GUMDROP) Sure is.
02 22 43 24 CC Spider, Houston.
02 22 43 39 CC Spider, this is Houston.
02 22 43 53 CMP (GUMDROP) Houston, Gumdrop. Spider is reading you. Go ahead.
02 22 43 56 CC Roger. We are showing battery 4 is higher than the other three. We'd like to have him turn off battery 4 at this time, and we will give him a call. We'll turn it back on prior to DEPRESS.
02 22 44 15 CMP (GUMDROP) Spider, Gumdrop. Did you copy?
02 22 44 17 CC Hey, I'm sorry about that. It's lower than the other three - just to end the confusion. And we'll turn it off now, and we'll get it back on prior to DEPRESS.
02 22 44 31 LMP (SPIDER) Okay.
02 22 44 32 CMP (GUMDROP) Okay, Houston. Spider copied, and battery 4 is coming off.
CANDY (CC)

02 22 44 39
CC
Roger.

02 22 44 40
LAP
Gumdrop, was that battery 4 OFF or 3 OFF?

(SPIDER)

02 22 44 47
CMP
Battery 4, Spider. Battery 4.

(GUMDROP)

02 22 44 51
LAP
Roger. Battery 4 is OFF.

(SPIDER)

02 22 45 17
CC
Spider, Houston. I read your last transmission. If you read me, we'd like to know if Rusty is planning on being on the Commander's hoses and O2M leads -

02 22 45 50
CC
Spider, we'd like to have you go low bit rate, and at this time we'll see you over Carnarvon at about 14.

02 22 46 11
CC
And, Gumdrop, I am not reading Spider, if you will relay that to him.

CARNARVON (CC)

02 23 13 26
CC
Apollo 9 - Gumdrop and Spider, this is Houston through Carnarvon.

02 23 13 32
LAP
Roger. This is Apollo - This is Spider here.

(SPIDER)

02 23 13 36
CMP
And the Gumdrop.

(GUMDROP)

02 23 13 37
CC
Roger. Copy you both. Spider, could you give us high bit rate?

02 23 13 42
CC
Okay. We've got it, Spider.

02 23 13 45
CDR
Finishing up the ascent battery checkup, and we are going to start on EVA-17 here. We are going to be a little late for your 32 - systems-32.

(SPIDER)

02 23 13 56
CC
Roger. We understand.

02 23 13 59
LAP
And, Houston, the EV batteries are 35.8, 37.5, respectively.

(SPIDER)

02 23 14 06
CC
Roger. 36.8, 37.5. Thank you.
02 23 14 13 LAP (SPIPER) Roger. With the ascent batteries CE, ascent battery 5 is drawing 16 AMPS and 6 is drawing 10.

02 23 14 22 CC Roger. Copy.

02 23 14 32 CMP (GUNDROP) And, Houston, Gumdrops.

02 23 14 33 CC Go ahead, Gumdrops.

02 23 14 36 CMP (GUNDROP) Okay. On the other side, we are just about up to the time line; the hatch is closed and the hatch integrity - the tunnel hatch and the tunnel hatch integrity check is complete.

02 23 14 46 CC Roger. Copy, Gumdrops. If you've got about 30 seconds, I would like to talk to you a little bit about the attitude control on the rest of the day here.

02 23 14 58 CMP (GUNDROP) That was my next question. Go ahead.

02 23 15 00 CC Roger. I must be looking down your checklist. Okay. We would like to have you go with standard EVA configuration as far as quads A and - Alfa and Bravo are concerned, in other words, OFF. We would like to turn off the roll jets in quad Delta, leaving only quad Charlie for roll control. And when you start your attitude hold, we would like to do that with the limit cycle on. Now we may get some excessive firings. If we get just a series of small pulses, we would like to have you turn the limit cycle OFF.

02 23 15 09 CMP (GUNDROP) Okay. Understand quads A - Alfa and Bravo are OFF, Delta roll OFF, and limit cycle at the attitude hold. And I tried that the other day when we were doing something. I don't remember what, but in a tight - I know what it was. It was with the LM in a tight deadband; SCS to LIMIT CYCLE seemed to help quite a bit.

02 23 16 13 CC Roger. Copy.

02 23 16 17 CMP (GUNDROP) Now, do you want to try to assume an attitude, or do you just want to let it go until we think there may be a problem and then pick up an attitude?
02 23 16 30 CC Apollo - Gumdrop, this is Houston. We would like, if you could, to take just a gross cut at the proper attitude. Now if it's going to take you a lot to get there, why you might use your own judgment, but if you get somewhat near the right attitude and then - of course, the primary concern is just keep out of the cockpit.

02 23 16 54 CHP (GUMDROP) Okay. I'll give it a whirl.

02 23 16 56 CC Okay.

02 23 17 10 CC And, Spider, this is Houston. We show you have gone to low bit rate. We would like to leave it on high, please.

02 23 17 20 CDR (SPIDER) Roger. High.

02 23 18 02 CC And, Spider, this is Houston. When you get a chance, we would like to get an onboard readout of your supercritical helium, and we'd like to remind you about the circuit breaker on panel 11 - to get that reading. We are showing it a little lower than normal. And we would also like to have a comment on how you will be hooked up to the LM hoses. Will the CDR be on the LMP's hoses and COMB umbilical?

02 23 18 37 CDR (SPIDER) No. CDR will be on his own hoses.

02 23 18 40 CC Understand. Copy. The CDR will be on his own hoses.

02 23 18 44 CDR (SPIDER) You want me to read the SUPERCRIT pressure out, is that what you want?

02 23 18 47 CC That is affirmative. That's when you get a chance.

02 23 18 54 LMP (SPIDER) Roger. Let's stand by a little while.

02 23 18 56 CC Roger. No sweat at all.

02 23 19 06 CHP (GUMDROP) Houston, Gumdrop. I just got an H2 low pressure on the cryo pressure light. Do you want to do anything with that?
02 23 19 16  CC  Copy, Gumdrop. Stand by.
02 23 20 05  CC  And, Gumdrop and Spider. We will have Honeysuckle in about a minute. Let's bring up our S-band volumes.
02 23 20 14  OMG (GUMDROP)  Gumdrop.
02 23 20 15  LMP (SPIDER)  Spider.

HONEYSUCKLE (REV 45)
02 23 27 29  CC  And, Gumdrop and Spider. We are going to lose you at Honeysuckle here in about a minute. We will see you over the Mercury in about 6 minutes at 33.
02 23 27 37  LMP (SPIDER)  Okay.

MERCURY (REV 45)
02 23 34 24  CC  And, Gumdrop and Spider. We've got you through the Mercury for about 6 minutes. Standing by.
02 23 34 59  CC  Spider and Gumdrop, this is Houston through the Mercury. Standing by. We've got about another 4 minutes.
02 23 36 06  LMP (SPIDER)  Okay. Gum - Houston, this is Spider. How do you read?
02 23 36 09  CC  I'm reading you loud and clear, Rusty.
02 23 36 12  LMP (SPIDER)  Okay. We're just completing the donning procedure at this time, so it will be a while before we can make any COMM check here.
02 23 36 18  CC  Roger. Understand.
02 23 36 22  OMG (GUMDROP)  Gumdrop's with you.
02 23 36 24  CC  Roger, Gumdrop.
02 23 39 06  CDR (SPIDER)  Houston, do you read Spider?
02 23 39 09  CC  That's affirmative, Spider. We read you. We'll have you for about another minute and a half.
02 23 39 13  CDR (SPIDER)  Okay. We're not going to have enough time to make that COMM check.
02 23 39 19  CDR (SPIDER)  We have -
02 23 39 21  CC  No sweat, Spider.
02 23 39 24  CDR (SPIDER)  Go ahead.
02 23 39 25  CC  No sweat on that. We've already scrubbed it.
02 23 39 29  CDR (SPIDER)  Okay. Hey, I've got a recommendation to make here.
02 23 39 34  CC  Okay. Go ahead.
02 23 39 37  CDR (SPIDER)  Why don't we hook up the OPS to the - to Rusty the same way we normally hook it up - take out all those things that you scrapped this morning, put them back in.
02 23 39 48  CC  Okay. We copy that, and we're going to lose you here in about a minute. Let's see if we can give you a fast reading.
02 23 39 59  CDR (SPIDER)  Okay. He's feeling a lot better and he looks like - He's acting like he feels a little better. Maybe we can extend this a little bit.
02 23 40 08  CC  Okay. That's your judgment there, and we say go ahead if you feel that way, Jim.
02 23 40 15  CDR (SPIDER)  Okay. Let me - I'd like to configure that way, and then we will see how things go.
02 23 40 20  CC  Okay. Very good. And we'll see you over Guaymas about 52.
02 23 40 25  CDR (SPIDER)  Okay.
GUAYMAS (REV 46)

02 23 52 37  CC  Guadrop and Spider, this is Houston through Guaymas. Standing by.

02 23 52 44  CMP  (GUADROP)  Guadrop.

02 23 52 56  CC  And I copy you, Guadrop.

02 23 55 57  CMP  (GUADROP)  VHF A OFF.

02 23 56 10  LMP  (SPIDER)  Copy that. VHF antenna select ... disconnected the IX COMM cable, and connected the PLSS COMM umbilical. Do you want to get my audio breaker OPEN? And BIOMED should go to left now.

02 23 56 58  CC  And, Guadrop and Spider, you are GO for 63 dash 1.

02 23 57 06  CDR  (SPIDER)  ... door handle.

02 23 57 07  LMP  (SPIDER)  I know it.

02 23 57 10  CMP  (GUADROP)  Roger. Guadrop copies. GO for 63 dash 1

02 23 57 13  CC  Roger, Guadrop.

02 23 57 58  LMP  (SPIDER)  ... HIGH; VHF antenna selector 1 slash 2 ... PLSS valve to position 1; connecting the COMM cable; portable warning tone ON.

02 23 58 16  CMP  (GUADROP)  Reading you loud and clear. How about me?

02 23 58 18  CMP  (GUADROP)  Do you? Good.

02 23 58 21  LMP  (SPIDER)  Hey, Spider - or Guadrop - whatever your name is.

02 23 58 24  CMP  (GUADROP)  Roger. This is the Guadrop.

02 23 58 26  LMP  (SPIDER)  Configure for the normal EVA, Davey. We're going to skip all of these COMM checks, so just configure for your normal one-way down relay.
02 23 58 37  CRM (GUMDROP)  Okay. Just a minute.
02 23 58 42  LMP (SPIDER)  ... O2 pressure gage -
02 23 58 50  LMP (SPIDER)  Okay. Perform COMM check for CDR, CRM and biolink to MEFN.
02 23 58 54  CDR (SPIDER)  Let's skip MEFN.
02 23 59 28  CRM (GUMDROP)  Okay. Push/pull position 5.
02 23 59 36  CDR (SPIDER)  We're reading you okay ...
02 23 59 41  CDR (SPIDER)  PLSS mode position 3.
02 23 59 43  LMP (SPIDER)  PLSS ... in E.
02 23 59 44  CDR (SPIDER)  PGA dump.
02 23 59 49  CRM (GUMDROP)  Spider, Gumdorph.
02 23 59 50  CDR (SPIDER)  Go ahead, Gumdorph. Do you read Spider?
02 23 59 51  CRM (GUMDROP)  Roger. I'm reading you five-by; I couldn't relay. I guess I lose you; let me try again.
02 23 59 56  CDR (SPIDER)  Okay. Were you reading the PLSS? Try him now, Guesty.
03 00 00 00  CDR (SPIDER)  Just a second, Gumdorph ... before you go any place.
03 00 00 02  CRM (GUMDROP)  Okay.
03 00 00 03  CC  Spider, this is Houston. I hate to break in on that; I'm reading you. We need R and D, A and B circuit breakers ON and PFI ON.
03 00 00 19  CRM (GUMDROP)  Roger. I read you. Spider, did you copy Houston?
03 00 00 23 CDR (SPIDER) Have him give me another call. I think I hear him very weakly.
03 00 00 29 CC Spider, I was reading you real good just a second ago, Jim. We need R and D, A and B circuit breakers IN and the DFI ON.
03 00 00 40 CDR (GUMDROP) Okay, Smokey. This is Gumdrop. He got that. PLLS, the Gumdrop here. You are very weak, but readable.
03 00 00 49 CDR (GUMDROP) Still weak but readable.
03 00 02 11 CDR (SPIDER) Whistling around.
03 00 02 18 CDR (SPIDER) Okay. Your helmet’s on and locked.
03 00 02 38 CDR (SPIDER) Where are your other gloves?
03 00 02 42 CDR (SPIDER) Don’t need your watch, do you?
03 00 04 08 CDR (SPIDER) Where did the checklist go? Okay. Here it is. Got it.
03 00 04 31 CDR (SPIDER) Okay. Here, we don’t need this thing on it.
03 00 04 44 CDR (SPIDER) Snap - Recognize that?
03 00 05 00 CDR (GUMDROP) Spider, Gumdrop.
03 00 05 01 CDR (SPIDER) Go ahead.
03 00 05 02 CDR (GUMDROP) Let me give you a COMM check on VOX on the other panel, please.
03 00 05 07 CDR (SPIDER) Okay. Say, you gonna give me one?
03 00 05 10 CDR (GUMDROP) Roger. I’d like to listen to the ...
03 00 05 16 CDR (SPIDER) Okay. Go ahead.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 00 05 18</td>
<td>CMP (GUMDROP)</td>
<td>Okay. Gumdrop on the VUX. How do you read?</td>
</tr>
<tr>
<td>03 00 05 20</td>
<td>LMP (PLSS)</td>
<td>Loud and clear.</td>
</tr>
<tr>
<td>03 00 05 27</td>
<td>CC</td>
<td>Roger, PLSS. You're loud and clear. Very good on this panel.</td>
</tr>
<tr>
<td>03 00 05 34</td>
<td>CMP (GUMDROP)</td>
<td>Yes. It really sounds very good.</td>
</tr>
<tr>
<td>03 00 05 44</td>
<td>CMP (GUMDROP)</td>
<td>Okay. Very good.</td>
</tr>
<tr>
<td>03 00 05 54</td>
<td>CMP (GUMDROP)</td>
<td>PLSS, Gumdrop.</td>
</tr>
<tr>
<td>03 00 05 56</td>
<td>LMP (PLSS)</td>
<td>Roger. Go ahead.</td>
</tr>
<tr>
<td>03 00 05 58</td>
<td>CDR (SPIDER)</td>
<td>Okay. That sounds fine, too. Now I'm RELAY, and I'm all configured to hold both of them.</td>
</tr>
<tr>
<td>03 00 06 03</td>
<td>LMP (PLSS)</td>
<td>Roger. Understand you are in RELAY at this time.</td>
</tr>
<tr>
<td>03 00 06 06</td>
<td>CDR (SPIDER)</td>
<td>That's affirmative.</td>
</tr>
<tr>
<td>03 00 06 07</td>
<td>LMP (PLSS)</td>
<td>Roger. We are also, I think, in proper configuration right now.</td>
</tr>
<tr>
<td>03 00 06 15</td>
<td>CMP (GUMDROP)</td>
<td>Okay, Spider. How do you read me?</td>
</tr>
<tr>
<td>03 00 06 17</td>
<td>CDR (SPIDER)</td>
<td>I'm reading you okay, Davey.</td>
</tr>
<tr>
<td>03 00 06 19</td>
<td>CMP (GUMDROP)</td>
<td>Hey, that's great.</td>
</tr>
<tr>
<td>03 00 06 23</td>
<td>CDR (SPIDER)</td>
<td>Man, have I got a bunch of bugs over here.</td>
</tr>
<tr>
<td>03 00 06 28</td>
<td>CDR (SPIDER)</td>
<td>All the snaps are off them and the locks don't lock.</td>
</tr>
<tr>
<td>03 00 06 35</td>
<td>LMP (PLSS)</td>
<td>All I need to do is have that float out.</td>
</tr>
</tbody>
</table>
03 00 06 39  CMP (GUMDROP)  Jim, the only thing that we didn’t get that we
got to get is the TVA tether out.

03 00 06 45  CDR (SPIDER)  Yes.

03 00 06 49  LMP (FLSS)  ... sure here’s about 50 percent of the snaps in
the spacecraft left on.

03 00 07 00  CC  Spider and Gumdrop and FLSS, this is Houston.
And we can read all three of you loud and clear.

03 00 07 06  CDR (SPIDER)  Roger. Very good.

03 00 07 09  LMP (FLSS)  Roger, Houston. This is FLSS. Believe it or
not, I read you.

03 00 07 13  CC  Roger. You’re coming through beautifully, Rusty.
It’s loud and clear.

03 00 08 06  CC  Gumdrop, this is Houston. Did you call? If you
did, say again.

03 00 08 13  CMP (GUMDROP)  Roger, Houston. ... within 20 degrees of the
proper attitude ... go in attitude hold for about
10 minutes.

03 00 08 24  CC  Roger. Understood. Copy. And you came through
loud and clear there at the last, Gumdrop.

03 00 08 30  CDR (SPIDER)  This is Spider here. Just so everybody ...
familiar, I think we’ll do one daylight pass out
on the porch.

03 00 08 40  CC  Roger. Copy, Spider. And we agree with that
wholeheartedly. A loud cheer.

03 00 08 57  CDR (SPIDER)  You get that, Dave?

03 00 09 01  CDR (SPIDER)  Gumdrop?

03 00 09 09  CDR (SPIDER)  ... bypass out on the porch, okay?

03 00 09 15  CMP (GUMDROP)  Spider, Gumdrop. Go.

03 00 09 17  CDR (SPIDER)  Roger, Gumdrop. I say we are going to do one
daylight pass out on the porch.
03 00 09 21  CMP (GUMDROP)  All right.

VANGUARD (REV 46)

03 00 09 44  CDR (SPIDER)  Gumdrip, how do you read Spider?

03 00 09 46  CMP (GUMDROP)  All right.

03 00 09 49  CDR (SPIDER)  I don't read you any more, Gumdrip.

03 00 09 52  CMP (GUMDROP)  Okay, How about now?

03 00 09 54  CDR (SPIDER)  Reading you loud and clear now.

03 00 09 58  CDR (SPIDER)  How me?

03 00 10 06  CMP (GUMDROP)  Okay, Spider, Gumdrip. How do you read now?

03 00 10 11  CDR (SPIDER)  Read you loud and clear. How me?

03 00 10 14  CMP (GUMDROP)  Okay. You are five-by. Did you catch the comment on the break lock?

03 00 10 18  CDR (SPIDER)  Negative.

03 00 10 20  CMP (GUMDROP)  Okay. Seems like we break lock with the 8-band. I get a lot of static unless I turn relay off, so I'll probably have to run the relay off to hear you. I can't even hear you with my relay on when we break lock.

03 00 10 33  CDR (SPIDER)  Okay.

03 00 10 39  CDR (SPIDER)  Okay. 56 minutes to go - egress.
03 00 11 08  COR  (SPILLER)  key, I want to see where I am. I want to suit up here, too.

03 00 11 30  CNP  (SCUDROP)  Okay.

END OF TAPE
VANGUARD (REV 46)

I keep thinking of that food.

If you get it open, it's going to keep falling out.

I'll just leave it some place.

Yes, if it blows up, it won't hurt anything in there.

Spider, this is Houston. We would like to have DFI OFF and battery 4 ON.

You want DFI power OFF and battery 4 ON?

That is affirmative, Spider.

Okay.

And R and D circuit breaker Alfa OPEN.

Oh, okay.

Battery 4 coming ON. Oh, is that great.

I guess I better get this visor on.

Waste of time.

And, Spider and Gumdrop, you are GO for DEPRESS.

Roger. Spider.

Tell you what we'll do is you go on outside, stand there, get accustomed to what you are doing. I'll take a couple of pictures of you, ... look around, and get hold, Gumdrop. When you look like you're stabilized and you think you can handle something, I'll send the camera out to you.
(GOSS NET 1)

03 00 15 11  IMP  Right.
(PLSS)

03 00 15 18  CDR  Very cleverly put on that piece of rubber that
(SPIDER)  we've never had on this thing before.

03 00 15 30  CDR  Leave it off on this side. Get mine on first.
(SPIDER)

03 00 15 57  CDR  Okey-doke.
(SPIDER)

03 00 16 26  IMP  Remember to clean that out when we leave.
(PLSS)

03 00 16 48  IMP  Throw that up here.
(PLSS)

03 00 17 18  CDR  Okay. The camera is up there. Put the handle
(SPIDER)  on it.

03 00 17 26  IMP  Let's see; do we have the sequence camera cir-
(PLSS)  cuit breaker in here?

03 00 17 47  CDR  Test the belt.
(SPIDER)

03 00 17 56  CDR  I can't get that thing screwed in.
(SPIDER)

03 00 18 01  CDR  Look at that.
(SPIDER)

03 00 18 11  IMP  Hey, I can't get it out.
(PLSS)

03 00 18 17  CDR  ... get it out ...
(SPIDER)

03 00 18 33  IMP  That's supposed to go in that bag over there.
(PLSS)  Stick that over in the bag.

03 00 18 42  CC  Spiders and Cuddrop, 1 minute LOS Canaries. We
(SPIDER)  may talk to you over Tenamarive at about 12; if
not, Carnarvon at 14. And, Cuddrop, you do have a GO for DEPRESS. I didn't hear you acknowledge
it.
(GOSS NET 1)

03 00 19 05  CMP (GUMDROP)  Roger, Houston. Gumdrop copied the go for DEPRESS.

03 00 19 09  CC  Roger. You are loud and clear on that one.

03 00 19 11  CMP (GUMDROP)  Okay. Thank you.

03 00 19 17  LMP (PLSS)  Let me check to see if everything is glued down.

03 00 19 43  LMP (PLSS)  Verify the following: helmet visor 2, locked and adjusted - helmet tie down 2 adjusted, ... 02 connectors.

03 00 20 04  CDR (SPIDER)  ... Close and in.

TANANARIVE (REV 46)

03 00 32 05  CT  TAN AOS.

03 00 32 57  CMP (GUMDROP)  Spider, Gumdrop.

03 00 32 58  CDR (SPIDER)  Go ahead.

03 00 33 00  CMP (GUMDROP)  Be advised it is 73:02.

03 00 33 20  CMP (GUMDROP)  Hey, they gave me a time - a different time in that update this morning. Dave, they gave a new time, and I wrote it in the update.

03 00 33 25  CMP (GUMDROP)  I wrote the time down in the flight plan as 73:02.

03 00 33 37  CC  Spider and Gumdrop, this is Houston through Tananarive. Sunrise time is 06.

03 00 36 43  CT  Tananarive, Houston COMM TECH NET 1.

03 00 36 46  CT  Houston COMM TECH, Tananarive.

03 00 36 51  CT  Roger. Are you receiving anything down from the spacecraft at this time?

03 00 36 55  CT  We were when they first came overhead, but we are not at the present time.
(GOSS NET 1)

03 00 36 59  CT  All right, thank you.
03 00 37 14  CC  Spider and Gumdrop, Houston. Sunrise is at 08. We will see you over Carnarvon at 08.
03 00 47 56  LMP  (PLSS)  And I'm going to go to MAX as soon as the tone goes off and see if I do get good cooling.
03 00 48 04  GMP  (GUMDROP)  Hey, you've got the other LOG on.
03 00 48 05  LMP  (PLSS)  I know.
03 00 48 16  LMP  (PLSS)  Got that nice pump sound, though.
03 00 48 20  GMP  (GUMDROP)  Nice pump what?
03 00 43 21  LMP  (PLSS)  I say it's got that nice solid PLSS pump sound, though. Purrrr.

CARNARVON (REV 46)

03 00 48 30  GMP  (GUMDROP)  Rusty, how are you feeling?
03 00 48 32  LMP  (PLSS)  Good.
03 00 48 36  CC  Spider and Gumdrop. We've got you through Carnarvon. Houston standing by.
03 00 48 42  GMP  (GUMDROP)  We're probably going to have to REPRESS the cabin fairly slow.
03 00 48 45  CDR  (SPIDER)  Okay.
03 00 48 47  CDR  (SPIDER)  First thing I pass you will be a Hasselblad; then I will pass you a cam - movie camera right after that - shortly thereafter.
03 00 48 54  LMP  (PLSS)  After I pass the Hasselblad in?
03 00 48 56  CDR  (SPIDER)  Okay.
I'll take a couple of pictures and pass you the Hasselblad. You take a couple and pass it back. I'll hand you the movie camera, and I'll take some more pictures with the Hasselblad.

And I'll retrieve the EVA sample, too.

Right. That too.

Wonder where that belongs?

What time did I say it was when I turned that on?

47, wasn't it?

I think so. 47.

Okay.

... PLSS water on at 47. It is now 49 35. Do you feel anything?

Is it cooling yet?

No, I'm waiting for the tone to go off.

That pressure? Okay, it's coming down to 4.1.

It picked up ... hooked up - locked.

The what?

The life line - your tether.

Yes.
03 00 50 30 LMP (PLSS) ... make sure I've got it all the way down?
03 00 50 36 LMP (PLSS) Okay. Feed water is ON. Going to MAX cooling.
03 00 50 41 LMP (PLSS) Come on, Baby.
03 00 50 56 CMP (GUMDROP) -- Blink.
03 00 50 57 CDR (SPIDER) Okay. It's now showing 250, and we've turned the cooling ON - MAX cool, and Rusty says he feels the cooling cooling.
03 00 51 07 CMP (GUMDROP) Great.
03 00 51 20 CMP (GUMDROP) Okay. Spider, Gumdrop.
03 00 51 26 CDR (SPIDER) Go ahead.
03 00 51 28 CMP (GUMDROP) I'm all set to DEPRESS whenever you give the word.
03 00 51 32 CDR (SPIDER) Okay. We're all set over here, Dave.
03 00 51 35 CMP (GUMDROP) Say again.
03 00 51 38 CDR (SPIDER) Roger. You are clear to DEPRESS.
03 00 51 40 CMP (GUMDROP) Okay. And I just checked all the systems, and everything's running like a clock.
03 00 51 46 LMP (PLSS) Going back to intermediate cooling.
03 00 51 48 CDR (SPIDER) Very good.
03 00 52 00 CDR (SPIDER) Okay. My antenna is released.
03 00 52 02 LMP (PLSS) Yes.
Okay, I've got ---

I've ... down ...

The antenna is all bent out of shape, but it will ...

Is it still out of shape? Come down ...

No. It's all right now.

It means you got to be careful now with that flap on that door handle.

Yes. I know. It's almost impossible not to wipe that off.

There. Velcro is back in.

Say again.

I have a Velcro closed again.

Okay.

How's the descent oxygen and everything look?

They're all doing fine.

Let's see, that cabin pressure is still reading at a tenth, isn't it?

Yes.

The next thing I've got to do is not get this doggone tether tangled around my wrist. Okay. I got it the right way now.

Don't get it tangled around any of your knobs either, on the way out.
(COSS NET 1)

03 00 53 31  LMP (PLSS)  Yes.
03 00 54 24  LMP (PLSS)  I've got a MIN cooling.
03 00 54 27  CDR (SPIDER)  Okay.
03 00 54 35  CMP (GUMDROP)  About 10 minutes to sunrise.
03 00 54 54  CC  Spider, Gumdrop. No need to answer. Sunrise 08.

HONEYSUCKLE (REV 46)

03 00 56 19  CDR (SPIDER)  Hello, Spider.
03 00 56 39  CDR (SPIDER)  Hello. Can you read, Spider?
03 00 56 48  CMP (GUMDROP)  ... and Honeysuckle, too, but now Honeysuckle on S-band only.
03 00 56 52  CDR (SPIDER)  Yes, that's right.
03 00 56 57  CC  Spider and Gumdrop, this is Houston through Honeysuckle. I'm reading the SPIDER loud and clear.
03 00 57 06  CDR (SPIDER)  Listen, this is Spider. Transmitting in the dark. If you read, fine; if you don't, too bad. It's 07:57. We've had this cabin depressurized for about 12 minutes. Everything looks like it's going along fine, now. Rusty's PLSS seems to be working all right, and Dave is in the process of depressurizing the...-

03 00 57 37  CMP (GUMDROP)  They were calling in the middle while you were trying to talk, Jim.
03 00 57 40  CC  Roger. Spider, this is Houston. I copy all of that. You are coming through loud and clear. I'm reading the PLSS loud and clear.

03 00 59 02  CMP (GUMDROP)  Spider, Gumdrop.
Go ahead, Gummy. Here's the Spider.

Okay. All DEPRESSED, and everything is looking good.

Notice anything when you open the door?

No. I haven't opened the door yet.

Okay.

Don't lose anything when you do.

Okay. I'll try.

I'll be the goaltender – keep everything in.

Yes.

Okay, we're about – sort of between 4 and 7 minutes of being at sunrise, Dave. You might go ahead and start the door.

Okay, sure will.

Are you hearing the data at all?

No.

I feel much different with this down.

Any change?

Yes. At lot quieter.

I'll go back to data.
Put that - I wasn't hearing any data for a long time, so I wasn't hearing any noise for a long time, and then about 5 minutes ago I started picking up a lot of high static. And I don't know how it started; it sort of dribbled on down. I thought that's what that still was. When we first cranked that up, it was just as clear as a bell. In fact, now it's not making as much as it was before we got this other FREQ on.

Well, we've had a little problem with some of the commutators. The transducers or the battery current things - Sometimes it will fall to detent, and it makes a funny noise. That happened in chamber A. It could be that same thing. Maybe if you wiggle it in 1, you will hear a different noise.

Oh, okay.

Come on, PLSS.

Roger, Spider and Gumdrop. We're going to lose you here at Honeysuckle, and you're showing 6 minutes to sunrise.

How's your cooling?

How are you feeling?

Good.

Okay. Spider, Gumdrop. The hatch is open. No sweat. It just swings like it ought to swing.

Very good; let's hope it swings back again, now.
Well, it stays just where I wanted it.

Good.

Where I put it.

Gumdrop and Spider, Houston. Sunrise will be in about 5 minutes 40 seconds. We're going to lose you at Honeysuckle.

I can see Rusty's foot.

Very good.

Does he have a camera set up, Dave?

Forgot.

Hey, this is like spectacular.

Pretty neat, huh?

Oh, boy!

Can you see me wiggling my toes?

Sure can.

If Jim looks out the top window he can see me.

Just so I can see you, Dave.
Jim, you're going to have to try and be a little more careful about that VOX cutting - You've got a squeal in both your units.

Oh, gee. I'm glad we stopped here. I pulled down my visors.

Okay, I've got the EVVA now.

He's brilliant.

Okay. I'm going to reset the PEP here and go on. I'm going to go on up.

Okay.

Did you see that moonrise?

What?

The moonrise.

Yes.

Yes. You really can see at night, can't you?

Yes.

Okay. The sun is going to be just about over your left shoulder. How's that?

While standing in the slippers?

Right.

Okay.

... over there, Dave. You hold y deadband limit cycle?
03 01 06 56 CMP (GUMDROP) Yes, I had to turn the limit cycle off. It was just banging too much.

03 01 07 23 CDR (SPIDER) Okay. That ought to about do it, hadn't it?

03 01 07 25 CMP (GUMDROP) Sort of looks like it.

03 01 07 27 CDR (SPIDER) Mr. Schweickart, proceed on the door.

03 01 07 30 LMP (PLSS) Do you have your camera on there, CMP?

03 01 07 32 CMP (GUMDROP) It's ready.

03 01 07 34 LMP (PLSS) Okay. Proceeding on out.

03 01 07 43 CDR (SPIDER) I see a little bag full of --

03 01 07 49 CMP (GUMDROP) Floating away?

03 01 07 52 LMP (PLSS) Yes. I missed that one.

03 01 07 57 LMP (PLSS) It has a red dot on it and a striped line.

03 01 08 06 CMP (GUMDROP) Jim has that one.

03 01 08 05 LMP (PLSS) Okay, in the golden slippers.

03 01 08 12 LMP (PLSS) Hello, there.

03 01 08 15 CMP (GUMDROP) Hello, there. That looks comfortable.

03 01 08 18 LMP (PLSS) Boy, oh boy; what a view!

03 01 08 20 CMP (GUMDROP) Isn't that spectacular?
<table>
<thead>
<tr>
<th>Time</th>
<th>IMP (FLSS)</th>
<th>CDR (SPIDER)</th>
<th>CDR (SPIDER)</th>
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<th>IMP (FLSS)</th>
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</thead>
<tbody>
<tr>
<td>03 01 08 21</td>
<td>It really is. There's the moon right over there.</td>
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<tr>
<td>03 01 08 29</td>
<td>Okay, Rusty. The Hasselblad is going to be useless from here except to take a picture of Dave.</td>
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<td>03 01 08 38</td>
<td>Okay.</td>
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<td>03 01 08 42</td>
<td>Did you reel out the ...</td>
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<tr>
<td>03 01 08 45</td>
<td>Why don't you just throw it out ...</td>
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<td>03 01 08 48</td>
<td>Okay. Take it easy for a while.</td>
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<td>03 01 09 03</td>
<td>I'm going to get that - We'll never get it opened again.</td>
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<td>03 01 09 10</td>
<td>Dave, how do you read?</td>
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<td>03 01 09 12</td>
<td>Five-square. How me?</td>
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<td>03 01 09 13</td>
<td>Okay. Read you just fine. Are you in RELAY now?</td>
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<td>03 01 09 16</td>
<td>That's right.</td>
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<td>03 01 09 17</td>
<td>Very good.</td>
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<tr>
<td>03 01 09 19</td>
<td>Why don't you say hello to the camera or something?</td>
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<tr>
<td>03 01 09 23</td>
<td>Hello there, camera. Boy, is this great!</td>
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<tr>
<td>03 01 09 31</td>
<td>The sequence cameras ... Oh heck. Let me take one of the radar antenna. I haven't taken one of that.</td>
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REDSTONE (REV 46)
Spider and Gumdrop, we have you through Redstone, and we've been copying you loud and clear.

Very good, Houston. Everything's going along fine up here.

Roger. We copied you all across Carnarvon and Huntsville real well; we've been following you, and it sounds great.

Okay. Do you have anything special that you want done in this pass?

No, unless you want to poke the TV camera out there.

I'm not sure we can get that configured out that quickly.

Roger. Understand.

Dave, are you taking some more movies?

I will as soon as he passes the camera out to you.

Dude, are you ready for this camera?

Yes.

Okay. Haul away.

Camera - It's running.

Dude, you ought to get a picture of this relay here. It's too late.

I'm taking it.

Okay.

Little more.
Spider and Gumdrop, this is Houston. You are clear to do anything - go as far as you want.

Houston, you cut up on that one; say that again.

Roger. Just let you know that it sounds great, and you are clear to go as far as you want to as far as we're concerned.

Okay. What about the time limit? How are you feeling, Rusty?

I'm feeling fine.

Houston, do you want to go ahead and try the thing for two day passes and the one night pass? Looks like we might be able to do that for you.

Jim, that's your decision, it's up to you; it's all GO with us.

Okay. The thing that bothers me is if it does, we may have to reconsider how we're going to do the rendezvous tomorrow. We're going to have to get some sleep here sometime.

Roger. We copy.

Well, think it over and see what you decide.

Okay.

And, Houston, Gumdrop.

Houston, Gumdrop.

Houston, Gumdrop is calling. How do you read?

Go, Gumdrop.

Now we do.
03 01 22 32  LMP  (PLSS)  But I can't really tell when the jets are firing, and it's sort of hard for me to tell on the quantity.
03 01 22 52  CDR  (SPIIDER)  Okay, Rusty. Why don't you start hauling out again?
03 01 22 55  LMP  (PLSS)  Okay. Coming out.
03 01 23 01  CMP  (SPIIDER)  Hey, how about giving Houston a call and asking them about that?
03 01 23 04  LMP  (PLSS)  Okay. Hey, Houston. How do you read the PLSS?
03 01 23 08  CC  PLSS, you are coming through loud and clear.
03 01 23 12  LMP  (SPIIDER)  It keeps slipping, Jim. You're going to have to help the cable come out a little. Let me get up closer.
03 01 23 20  CDR  (SPIIDER)  Just a minute.
03 01 23 21  LMP  (PLSS)  Never mind; I got it. I'll just come up closer here. Okay, I got it now.
03 01 23 31  CC  Gumdrop, this is Houston. You are using very little propellant; looks real good.
03 01 23 38  CMP  (GUMDROP)  Okay, Houston. Thank you. Just wanted to make sure.
03 01 23 43  CC  And, Spider, this is Houston. We are recommending that you terminate at the end of this daylight pass.
03 01 23 50  CDR  (SPIIDER)  Okay. I sort of felt that way too. I don't think we ought to try that transfer for sure.
03 01 23 55  CDR  (SPIIDER)  All right. We'll terminate here.
03 01 24 01  LMP  (PLSS)  Okay, Davey. Come on out.
03 01 24 03  CMP  (GUMDROP)  Okay. I'm going to let the camera run here.
03 01 24 08  LMP  (PLSS)  Dave, come on out, wherever you are.
(GOSS NET 1) Tape 47/18
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03 01 24 10 CMP (GUMDROP) Stand by. Let me get away my little pushbutton. Now we're all taking pictures of everybody taking pictures.

03 01 24 25 LMP (PLSS) Yes; you want to retrieve the sample?

03 01 24 27 CMP (GUMDROP) Roger. That's a good idea.

03 01 24 33 CC And, Gumdrop, you'll be getting a warning on your $H_2$ tank in about 4 minutes.

03 01 24 36 CMP (GUMDROP) Hey, Rusty. Why don't you lean over here again; I'd sure like to get a picture of that whole scene.

03 01 24 41 LMP (PLSS) Okay. Coming over.

03 01 24 49 CC Gumdrop, you'll be getting a warning in about 1 minute on your $H_2$ tank. No sweat.

GOLDSTONE (REV 46)

03 01 25 03 CDR (SPIDER) ... bet those window marks were over there.

03 01 25 06 LMP (PLSS) Yes.

03 01 25 17 CC Gumdrop, this is Houston. You may be getting a warning on your $H_2$ tank; no problem.

03 01 25 19 CMP (GUMDROP) Okay.

03 01 25 26 CMP (GUMDROP) Hey, you ready for --

03 01 25 29 LMP (PLSS) Okay. You ready?

03 01 25 30 CMP (GUMDROP) -- thermal samples here?

03 01 25 32 LMP (PLSS) Ready.
Okay, Dave. Let me get around here where I can get a picture, too.

Okay.

Gumdrop, Houston.

Okay. Look at all these marks all over these windows; shoot. Oh, dear.

Gumdrop, Houston.

Hey, Dave. Are you ready?

Hey, use your head when you're out there; you know this isn't a contest between you and that sample.

Roger.

Gumdrop, Houston. Anticipate a warning very soon on your H₂ tank.

Okay. And you want to hook it in the solid ring, David, rather than that wire.

Okay.

No problem. There's one.

It didn't even close on itself.

Now you got to pull ... and there's one more. Okay, now, next one - oops!

How about this.

That's the thermal sample.

Yes, you're getting it wrapped up around your neck.

...
(GOSS NET 1)

03 01 27 05 LMP (PLSS) Okay ...
03 01 27 16 CC Gumdrop, do you read Houston?
03 01 27 18 CMP (GUMDROP) Do we --
03 01 27 25 CC Gumdrop, do you read Houston?
03 01 27 29 LMP (PLSS) Oh, there's Baja California. Oh, very pretty!
Wonder if I got any film left? Oh, yes; got more film here - going across Baja here.
03 01 28 02 CDR (SPIDER) That's one place that's not too hard to recognize.
03 01 28 05 LMP (PLSS) Yes. That's true. Got to switch hands with the camera.
03 01 28 17 LMP (PLSS) Oh, no. You got it on a sixtieth, though.
03 01 28 20 CDR (SPIDER) It wasn't when it went out there.
03 01 28 24 LMP (PLSS) Okay. You got it now.
03 01 28 28 CC Spider, do you read Houston?
03 01 28 34 LMP (PLSS) I wonder if I ought to keep it there.
03 01 28 38 CDR (SPIDER) I don't know. The other ones were taken at 250; it depends on when it got knocked over. If it got knocked over when you ... when it was going out. Why not leave it there?
03 01 28 48 LMP (PLSS) Is this the camera we used this morning when I took pictures inside the tunnel with the wide angle lens on it at a sixtieth, Jim?
03 01 28 56 CDR (SPIDER) Well, I --
03 01 29 07 LMP (PLSS) Did you know there is a washer between the two panes of our overhead window?
03 01 29 11 CDR (SPIDER) Hey ...
03 01 29 14  CMP (GUMDROP)  Okay. Come on in and I'll fix you --

03 01 29 19  CC  Gumdrop, this is Houston. Do you read?

03 01 29 22  LMP (FLSS)  Houston, LMP receiving.

03 01 29 24  CC  Roger. Pass the word to Gumdrop that if he just got a MASTER ALARM, it's the H₂ tank; no problem.

03 01 29 31  CMP (GUMDROP)  The lights are off, which was not scheduled.

03 01 29 37  CC  Gumdrop, Houston.

03 01 29 52  CDR (SPIDER)  It's 2½ minutes through the run. We've got about another 15 minutes, and we should start thinking about getting back in.

03 01 31 04  CMP (GUMDROP)  Must be inhabited; the water's all dirty.

03 01 31 45  CMP (GUMDROP)  Hey, you ...

03 01 32 01  CMP (GUMDROP)  There you go. David, things are still falling out up there. What are you doing, throwing everything overboard?

03 01 32 26  CDR (GUMDROP)  Yeah, yeah.

03 01 32 31  CMP (GUMDROP)  The border sticks out, but the city doesn't.

03 01 32 40  LMP (FLSS)  (Laughter) Yes, the winds look pretty strong.

03 01 32 45  CMP (GUMDROP)  Lots of clouds.

03 01 32 47  LMP (FLSS)  ... flags.

03 01 32 50  CMP (GUMDROP)  That's right. They're red, white, and blue from up here.

03 01 33 09  LMP (FLSS)  Houston, how are you reading Red Rover here?

03 01 33 14  CC  Roger. Reading you loud and clear here; how do you read me?
03 01 33 27   IMP (FLSS) Wonder why they're not talking to us.
03 01 33 31   CC Spider; Gumdrop, this is Houston. How do you read me?
03 01 33 34   IMP (FLSS) Spider, are you reading Houston?
03 01 33 37   CMP (GUMDROP) Fo. I haven't heard him say anything, either.
03 01 33 40   CDR (SPIDER) This is Spider. Do you read?
03 01 33 44   CC Roger, Spider. This is Houston.
03 01 33 46   CMP (GUMDROP) ... I heard him then.
03 01 33 49   CC Spider, this is Houston. How do you read?
03 01 33 54   CDR (SPIDER) Houston, Spider. Do you read?
03 01 33 57   CC That's affirmative, Spider. This is Houston. Reading you loud and clear.
03 01 34 09   CDR (SPIDER) Okay, Rusty. Why don't you pass the camera back in here and work on the handrails for just a minute.
03 01 34 14   IMP (FLSS) Can you stand by one? Let me change film packs here.
03 01 34 20   CDR (SPIDER) Okay. Here comes a camera. Just a minute, let me get this other one zipped in. Now take it easy out there; don't want you getting --
03 01 34 25   IMP (FLSS) Okay.
03 01 34 27   CMP (GUMDROP) Hey, Rusty?
03 01 34 28   IMP (FLSS) Yes, sir?
03 01 34 29   CMP (GUMDROP) Stand by.
03 01 34 31  LMP  (FLSS)  Oh, I'm not going to start yet. I've got to pass this camera back in. Take your time.

03 01 34 42  LMP  (FLSS)  Oh, that sun is really bright! Houston, this is Red Rover. If you read me, I'm just going to call you in the blind here. The suit is very comfortable. I'm on MIN cooling, and I haven't had any problem at all. The only thing that is warm at all are my hands, and they are just barely warm; they are not very hot at all.

03 01 35 07  CC  Roger. Red Rover, this is Houston. We are reading you loud and clear. We are copying all transmissions.

03 01 35 20  LMP  (FLSS)  You know that tether - a good way of getting things in and out, but they are sort of out of control.

03 01 35 28  CDR  (SPIDER)  Why? Won't they get inside?

03 01 35 30  LMP  (FLSS)  It's just getting it through the last part of the door there. It ricocheted off everything on the door.

03 01 35 34  CDR  (SPIDER)  Oh, yes.

03 01 35 40  LMP  (FLSS)  You know, the one thing I didn't take a picture of was the hatch.

03 01 35 44  CDR  (SPIDER)  Hey, you want the camera back again?

03 01 35 45  LMP  (FLSS)  No; that's all right.

03 01 36 04  CC  Red Rover, this is Houston. How do you read?

03 01 36 05  CDR  (SPIDER)  ... have about 10 more minutes out there, and then you ought to start coming back in.

03 01 36 08  LMP  (FLSS)  Okay.

03 01 36 11  CDR  (SPIDER)  I want us to be in while it's still light outside.
03 01 36 18  LMP (PLSS)  Oh, we just passed over Florida or somewhere. It looks like maybe Jacksonville.
03 01 36 28  CC  Red Rover, Houston. How are you reading now?
03 01 36 30  LMP (PLSS)  It's all cloudy. I guess the Cape is clouded over.
03 01 36 45  LMP (PLSS)  Let me see if I can see any islands down there.
03 01 36 58  LMP (PLSS)  No. I can't tell how far north we are, but we came up fairly far south of the Beach, so ... 

03 01 37 08  CMP (GUMDROP)  Here, I'll shoot something out there, and we will make a satellite.
03 01 37 14  CMP (GUMDROP)  It's right between your legs. It's gone up, now it's down on your knee.
03 01 37 23  LMP (PLSS)  My heavens! It's an antifog wipe.
03 01 37 30  CMP (GUMDROP)  I'll tell you, the toughest part of the whole thing is trying to change the film magazine.
03 01 37 34  CDR (SPIDER)  Yes; I figured it would be, Dave.
03 01 37 37  CMP (GUMDROP)  It's a rather mundane task.
03 01 37 39  CDR (SPIDER)  Matter of fact, Rusty, why don't you get out there and move around a little bit and - Hey, there goes the camera, Dave.
03 01 37 45  CMP (GUMDROP)  No; it's tethered. I learned that from a friend of mine named Mike.
03 01 37 48  CDR (SPIDER)  Yes.
03 01 37 50  CDR (SPIDER)  Rusty, why don't you exercise the handrails just a little bit just to see how they work, and don't go very far up. And if Dave gets the picture, fine, and if he doesn't, well that's just too bad.
03 01 38 01  LMP (PLSS)  Okay.
(GOSS RET 1)

03 01 38 02 CDR (SPIDER) I think it's going to go 90 degrees to that way, Dave.
03 01 38 04 CMP (GUMDROP) Right.
03 01 38 06 CC Red Rover, Houston. Do you read?
03 01 38 10 CMP (GUMDROP) I can't see it very good.
03 01 38 13 CDR (SPIDER) ... don't know where to ...
03 01 38 17 LMF (PLEB) Say again.
03 01 38 18 CMP (GUMDROP) Ever see one of these things before, Dave?
03 01 38 19 CDR (SPIDER) ... about this zero 0.
03 01 38 24 LMF (PLEB) It's the somebody effect.
03 01 38 28 CDR (SPIDER) There you go. Got it.
03 01 38 29 CMP (GUMDROP) A friend of mine named Gene.
03 01 38 31 LMF (PLEB) Yes.
03 01 38 33 CMP (GUMDROP) He checked the various and sundry settings.
03 01 38 36 LMF (PLEB) Okay, as soon as you get that done, turn it on, and I'll be going here.
03 01 38 40 CDR (SPIDER) Why don't you come over and get the thermal sample and get it in so we won't have to mess around with it.
03 01 38 44 LMF (PLEB) That's a good idea; coming up. Hey, let me have my ...
03 01 38 49 CMP (GUMDROP) Oh, shoot.
03 01 38 53 CMP (GUMDROP) Wait a second. This poor movie camera. If it ever works again, we will be a miracle.
Was it kind of warm when it came in?

No. It just got dashed around. The hook doesn't hook onto it right; it slides up and down the wire, and it's got that stretched cable on it, so every time the tension comes out, the stretched cable slams it into something.

Okay.

Go ahead; pull it.

Okay. I'm coming.

Red Rover, Houston. Do you read?

Okay. Stand by.

Okay. ... Okay, hook it on down there and lock it. Dave, have you taken any pictures yet?

No, I can't get it to run now, would you believe?

Okay. The heck with it then.

We got smashed around a little bit, too. I think these cameras are good for one film pack, and that's about it when you are doing work like this with them.

Red Rover, Houston. Do you read?

Let me turn around here and get some stills.

Okay, Jim. Stand by just one here.

Gumdrop, Houston. Do you read?

Hey, anybody up there read me? This is Houston.

Oops, there goes a nut.
Okay. What, are you talking about me again?

(Laughter)

Okay. Pull her in. One each, thermal sample coming in.

Spider, Houston. Do you read?

Okay. Can you take up out there and let me get that hook back?

Yes; you just ... hang on a second.

Okay. I tell you what. I don't need the hook just to go part of the way up and back down again.

Goodness. Get down in there.

-- what ...

Do you want me to start, Jim?

Yes, Rusty.

Okay. Here I go.

Rusty, I want you to evaluate those handles and when you get through with that, I want a conclusion from you on whether or not it's a practical way of doing it, like we've already said it is.

Okay.

Stay away from the radar antenna.

Roger.
OH, YES. THIS IS VERY GOOD.

YES. HEY, LET ME GET THAT CAMERA OUT.

OKAY.

ANYTHING LEFT OF THAT ONE.

THIS IS VERY GOOD. THIS IS NO PROBLEM AT ALL.

GOOD. BE RIGHT THERE. SMILE.

HELLO, THERE. THIS IS NO PROBLEM AT ALL.

OKAY. GO ON BACK DOWN IT AGAIN. HEY, DAVE, DID YOU GET YOUR MOVIE CAMERA RUNNING YET?

NOT YET; BUT I WOULD LIKE TO TRY IT, IF YOU WILL GIVE ME A MINUTE.

WELL, YOU'VE GOT 4 MINUTES. WHEN THE 4 MINUTES ARE OVER, THEN WE ARE GOING TO HAVE TO COME BACK IN, WITH OR WITHOUT THE MOVIES. IF WE GET THEM, FINE.

YES, THERE ARE ALMOST NO DISTURBING TORQUES, I MEAN I DON'T HAVE ANY PROBLEM AT ALL JUST MAINTAINING MYSELF WHEREVER I WANT.

COME AROUND THE WINDOW HERE. CAN YOU?

YES. HOLD ON. I'LL JUST PUSH OUT A LITTLE BIT.

WAIT, LET ME COME UP THIS WAY. HOW'S THAT?

GOOD.

I'M IN THE SHADE, THOUGH.
03 01 42 15 CDR (SPIDER) That's okay.

03 01 42 18 LMP (PLSS) Now, you got to get a good picture.

03 01 42 21 CDR (SPIDER) If we got any good pictures, it will take a lot of them.

03 01 42 24 LMP (PLSS) Yes. Then, too, maybe it will change the setting a little too.

03 01 42 38 LMP (PLSS) How's that?

03 01 42 42 CDR (SPIDER) That was pretty good.

03 01 42 43 LMP (PLSS) Yes. I don't want to touch your quad, though.

03 01 42 45 CDR (SPIDER) Good idea. Don't touch the quad.

03 01 42 48 LMP (PLSS) Yes.

03 01 42 59 CDR (SPIDER) Yes. The trouble is, I've got this latch ... I'll try to take pictures around that. I'm not sure I'm succeeding.

03 01 43 05 CDR (SPIDER) Okay, Dave. You ought to take some pictures that I can turn around and - Rusty, why don't you go up and down the thing. Go back down to the shoes and get back out there again, and let's call it quits.

03 01 43 41 CC Spider, this is Houston. We are copying all transmissions loud and clear.

03 01 43 51 LMP (PLSS) That's a very pretty scene.

03 01 44 15 CC Spider, this is Houston - or Gumdrop or Red Rover. Do you read?

03 01 44 27 CC Hello, Gumdrop. This is Houston. How do you read?

03 01 44 46 CDR (SPIDER) Okay, Dave. Do you have it running yet?

03 01 44 48 CMP (GUMDROP) Just about.
We're going to have to come in.

Just about.

Want to set it on 24 frames a second?

Yes. And hand hold it there. You're going to have to come in.

Is it working?

I can't tell. Just a minute.

I could feel it when mine was going.

I'm afraid, amigo, the camera has failed.

Okay.

Okay.

Okay, Rusty. Why don't you start coming in?

Right. Coming in.

Oh, shoot.

Okay, Jim. Do you want to pull in the tether a little?

I'd sure like to.

I believe the door finally got itself closed and stuck. It's open now again.

Okay.
GOLDSTONE (REV 47)

---- ---- CDR (SPIDER) .... Believe the door finally got itself closed and stuck.

---- ---- CDR (SPIDER) -- open now again.

---- ---- LMP (FLSS) Okay.

---- ---- CDR (SPIDER) Okay. How ... I'll do my best to stay out of your way. The only trouble is my hoses are kind of out where you are liable to hit them.

---- ---- LMP (FLSS) Okay.

---- ---- CDR (SPIDER) Okay. I think they're out of your way.

---- ---- CDR (SPIDER) ...

CANARY (REV 47)

03 01 47 45 CDR (SPIDER) It's going to take me awhile to get down there and get that thing closed. I just wanted to make sure you got back inside. I'm having trouble with the hatch. Every time it's been once closed ...

03 01 47 58 LMP (FLSS) ... while it's still daylight.

03 01 48 02 LMP (FLSS) How can I help you?

03 01 48 04 CDR (SPIDER) We ought to close that thing so I can see this hatch before I try to lock it.

03 01 48 14 CDR (SPIDER) ... there we are.

03 01 48 17 LMP (FLSS) Okay.
(GOSS NET 1)

03 01 48 19 LMP (PLSS) Okay, now.
03 01 48 24 LMP (PLSS) Okay!
03 01 48 26 CDR (SPIDER) Hey!
03 01 48 27 LMP (PLSS) Okay.
03 01 48 28 LMP (PLSS) Let me get across the top here. Maybe I can get out of your way. No. That isn't going to work; let me get back in the corner.
03 01 48 36 CDR (SPIDER) No. I think it's okay.
03 01 48 39 LMP (PLSS) Looks like it's all right the way it is.
03 01 48 41 CDR (SPIDER) The best that you can do, if you can, is to gather this tube up here; sort of keep it up off the floor.
03 01 48 51 CDR (SPIDER) Okay, Dave. You ought to start getting your hatch closed.
03 01 48 55 CMP (GUMDROP) Say again.
03 01 48 56 CDR (SPIDER) Better start getting your hatch closed if you aren't already doing it.
03 01 49 00 CMP (GUMDROP) Okay.
03 01 49 05 CC Spider, this is Houston. Do you read? Sounds like you have your hatch closed.
03 01 49 11 CDR (SPIDER) No, not quite. It closed, just not locked. 
03 01 49 16 CC Roger. Understand.
03 01 49 18 CMP (GUMDROP) Houston, Gumdrop.
03 01 49 20 CC Gumdrop, Houston. Go ahead.
03 01 49 23 CMP (GUMDROP) Gumdrop's hatch is closed and locked.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 01 49 26</td>
<td>CC</td>
<td>Roger. Understand. Hatch closed and locked. Good show. And I couldn't get up to you, but all three of you were coming in loud and clear. Sounded like Red Rover had quite a time.</td>
</tr>
<tr>
<td>03 01 49 44</td>
<td>CDR (SPIDER)</td>
<td>... Well, I hate to do it, but I've got to get my head in front of your legs, instead of behind them.</td>
</tr>
<tr>
<td>03 01 49 53</td>
<td>CDR (SPIDER)</td>
<td>There, that's good.</td>
</tr>
<tr>
<td>03 01 49 56</td>
<td>CDR (SPIDER)</td>
<td>Oooh, it's closed! Locked!</td>
</tr>
<tr>
<td>03 01 49 58</td>
<td>LMP (PLFS)</td>
<td>It's locked!</td>
</tr>
<tr>
<td>03 01 50 00</td>
<td>CC</td>
<td>Houston. Copy.</td>
</tr>
<tr>
<td>03 01 50 31</td>
<td>CC</td>
<td>And, Spider and Gumdrop, if we lose you over Canaries here in a couple of minutes, we'll see you over Thanarive about 06.</td>
</tr>
<tr>
<td>03 01 50 39</td>
<td>CDR (SPIDER)</td>
<td>Okay.</td>
</tr>
<tr>
<td>03 01 50 42</td>
<td>SC</td>
<td>... this again. I ha --</td>
</tr>
<tr>
<td>03 01 50 49</td>
<td>SC</td>
<td>... Bravo ...</td>
</tr>
<tr>
<td>03 01 50 52</td>
<td>CDR (SPIDER)</td>
<td>Okay. I got it.</td>
</tr>
<tr>
<td>03 01 50 53</td>
<td>LMP (SPIDER)</td>
<td>-- order, this one should be in order ...</td>
</tr>
<tr>
<td>03 01 50 57</td>
<td>SC</td>
<td>-- do you?</td>
</tr>
<tr>
<td>03 01 50 59</td>
<td>SC</td>
<td>-- Okay.</td>
</tr>
<tr>
<td>03 01 51 10</td>
<td>CDR (SPIDER)</td>
<td>... in REPRESS code AUTO. Let's see, let's --</td>
</tr>
<tr>
<td>03 01 51 12</td>
<td>LMP (SPIDER)</td>
<td>What are the steps after that?</td>
</tr>
<tr>
<td>03 01 51 15</td>
<td>CDR (SPIDER)</td>
<td>... CABIN REPRESS, AUTO CABIN, and it's 4.4 psi.</td>
</tr>
<tr>
<td>03 01 51 20</td>
<td>SC</td>
<td>Okay.</td>
</tr>
<tr>
<td>03 01 51 22</td>
<td>CDR (SPIDER)</td>
<td>And, we'll do it at 46 ...</td>
</tr>
</tbody>
</table>
(GCSS NEXT 1)

03 01 51 27 SC -- from AUTO!
03 01 51 31 SC -- AUTO?
03 01 51 40 CDR (SPIDER) -- I'm repressing.
03 01 51 53 CDR (SPIDER) -- Rusty?
03 01 51 54 LMP (SPIDER) What's that?
03 01 51 55 CDR (SPIDER) Oh, yes.
03 01 52 05 CDR (SPIDER) OPS purge control CLOSED.
03 01 52 16 CDR (SPIDER) There we go!
03 01 52 25 CDR (SPIDER) How are your ears?
03 01 52 28 CDR (SPIDER) How are your ears, Rusty?
03 01 52 31 LMP (SPIDER) Okay.
03 01 52 38 CDR (SPIDER) Okay, Rusty. The psi.
03 01 52 48 LMP (SPIDER) 2.2.
03 01 52 59 LMP (SPIDER) About 3.
03 01 53 00 CDR (SPIDER) ... cabin pressure a little ...

TANANARIVE (REV 47)

03 02 06 00 CC Spider; Gumdrop, Houston through Tananarive.
03 02 06 54 CC Spider; Gumdrop, Houston through Tananarive. Receiving no transmission. All stand by and talk to you over Carnarvon at 22.
Spider; Gumdrop, Houston through Tananarive.
How do you read?
Tananarive M&O, Houston CAP COMM. Do you read?
... Tananarive.
Roger. Am I going up to the spacecraft?
Say again.
Roger. Are you hearing anything from the spacecraft?
Negative. Downlink from the spacecraft, but you are going out, though.
Okay. Thank you.

CARNARVON (REV 47)

Go ahead, Gumdrop.
How are you doing over there?
Okay. We are trying to get through the ... get it back ...
Okay. Everything squared away over here. We are back up to 5.1; the O₂ flow now is ...
And, Spider and Gumdrop, this is Houston through Carnarvon. Reading you loud and clear.
Spider and Gumdrop, Houston through Carnarvon.
Houston, this is the Spider.
Roger, Spider. Reading you loud and clear.
And, Houston, this is Gumdrop. Back up to 5.1. Everything is nominal.
Roger. Copy, Gumdrop.
Hey, Houston. This is Spider.
(GOSS NET 1)

03 02 22 53 CC  Go ahead, Spider.
03 02 22 57 CDR (SPIDER) Spider here, Houston. What time was TV pass?
03 02 23 08 CC  Roger, Spider. It's 7½ plus 57 and will last until 75 plus 13.
03 02 23 18 CDR (SPIDER) Can't read him. See if you can get him.
03 02 23 21 CMP (GUMDROP) Roger. Understand, Houston. 7½ plus 57 to 75 plus 13. Is that correct?
03 02 23 27 CC  That's affirmative, Gumdrop.
03 02 23 31 CMP (GUMDROP)  Okay. You copy, Spider?
03 02 23 33 CDR (SPIDER)  Yes; we got it.
03 02 23 34 CMP (GUMDROP)  He copies.
03 02 28 30 CC  And, Spider and Gumdrop, we are going to lose you here at Carnarvon in about a minute. We'll see you over Huntsville about 37.
03 02 28 37 CMP (GUMDROP)  Roger. Huntsville 37.

HUNTSVILLE (REV 47)

03 02 38 12 CC  And, Spider; Gumdrop, Houston through the Huntsville. Standing by.
03 02 39 18 CC  Spider and Gumdrop, this is Houston through the Huntsville. How do you read?
03 02 44 02 CC  And, Gumdrop; Spider, if you read, we will see you over Hawaii in about 4 minutes.

HAWAII (REV 47)

03 02 47 44 CC  And, Spider; Gumdrop, Houston through Hawaii. Standing by.
Hello, Houston. This is Spider.

Roger, Spider. Reading you loud and clear.

Okay. On this TV pass, all you want is a TV on. You don't want a whole bunch of COMM checks, do you?

That is affirmative. We would just like to look at some nice, pretty pictures of you all.

We don’t have any up here.

Okay. Be advised we will be in basic COMM band, with the exception that the S-band will be in MODULATE, and we will have the TV breaker pushed in.

Roger. Copy. You will be basic COMM S-band FM, and you will be having a circuit breaker shortly before 57. Affirm?

That is affirmative, and we are in FM now; and when we come over the hill at 55, we will push the TV breaker closed.

Okay. At 55 you will be closing the breaker.

Right.

And, Spider, this is Houston. I'm not trying to hurry you at all; just at your convenience, we would like to have an onboard readout of your supercritical helium.

Roger. In work for your information, the onboard readout of the O₂ quantity is 57 percent, and be advised we REPRESSED the command module for about 2 psi, to about 4.5.

Roger. Copy.

Houston, it looks like it is about 750.

Roger. Copy 750. And that verifies our reading. And just for your info, we feel this is either a leak upstream of the helium - -

-- Houston, are you still there?

Roger, Spider. How do you read Houston?
Hello, Spider. This is Houston. Do you read?

Hello, Gumdrop. Do you read Houston? I haven't heard you over Hawaii here.

Hello, Spider. Houston. How do you read?

Spider; Gumdrop, Houston. How do you read through the Redstone?

Hello, Spider; Gumdrop, this is Houston through the Redstone. How do you read?

Spider; Gumdrop, Houston. How do you read?

Spider; Gumdrop. How do you read Houston?

Okay, Spider. This is Houston. We do have a TV picture. We are receiving no voice.

Roger. Understand you are receiving no voice.

Oh, that's it. You are coming through loud and clear, Rusty.

Oh, crazy. You're reading voice now.

Okay. We are in the process of recharging the PLSS. We have recharged it with oxygen, and we've just put in the water, and we are going to vent now.

Roger. Your picture is good. We can see you loud and clear going down the checklist there like a good pilot.

Right.

And, Spider, this is Houston. Do we still have you in voice here?
03 02 59 17  CDR (SPIDER) Sure do. Just kind of busy here. That's why we are not talking.
03 02 59 23  CC Okay. Understand.
03 02 59 25  CDR (SPIDER) What we are doing is - We are recharging the PSS, and I'm eating my lunch.
03 02 59 30  LMP (SPIDER) Yes. The Commander is talking while he is eating. He's not supposed to do that.
03 02 59 56  CDR (SPIDER) Okay, Houston. It's done.
03 02 59 59  CC Oh, very good. Hey, it's a tremendous picture, Spider.
03 03 00 04  CDR (SPIDER) Great.
03 03 00 09  CDR (SPIDER) How much longer do we have on this picture? Ten minutes?
03 03 00 17  CC Yes. We've got it for about another 13 minutes, Spider. We can watch your whole lunch there - count your bites.
03 03 00 24  CDR (SPIDER) Thanks.
03 03 00 26  CC You are welcome.
03 03 00 33  CC And, Spider, were you reading me back over Redstone and Hawaii?
03 03 00 38  CDR (SPIDER) I read you the first time, but that was only one time.
03 03 00 41  CC Okay. Understand.
03 03 00 45  LMP (SPIDER) ... just barely in ...
03 03 01 00  LMP (SPIDER) Houston, Spider.
03 03 01 01  CC Go ahead, Spider.
03 03 01 03  LMP (SPIDER) We wondered - going over the stateside there - the EVA. Did you read us all the way? We noticed that you didn't say anything even when we asked questions.
03 03 01 13 CC We were reading everything - all of you - loud and clear, and we just weren't getting up to you. But the COMM from you was terrific. We read all your conversations - sounded like you were really having a ball.

03 03 01 27 LMP Yes. Pretty good view from out there.
(SPIDER) That's what you call a view from the top of the stairs - LM stairs, that is.

03 03 01 42 CDR Have you got any words of wisdom on tomorrow's flight plan yet, Smokey?
(SPIDER) Roger. We'll cover that with you later if you want. We'll settle down, and - Have you got anything that you can give us along the line about clearing the tunnel? It sounds like that goes pretty well.

03 03 02 02 CDR Yes. The tunnel doesn't take long at all. It's getting ready to clear the tunnel.
(SPIDER) Okay. And hey, Red Rover, we've - How about a big smile for the folks at home here. Let us know if you are feeling pretty good after that show.

03 03 02 23 CDR Yes. We're feeling gre as a matter of fact.
(SPIDER) McDivitt doesn't look so good, but he feels all right.

03 03 02 32 CC Well, that was a typical friendly CDR smile.

03 03 02 36 CDR Right. They don't like me because I have got a better beard than they do.
(SPIDER) Straight teeth, but a crooked smile.

03 03 02 46 CC I don't like you because you've got a better view than I do.

03 03 02 50 CDR That's okay. We just don't like you.
(SPIDER) Okay. We are coming up on a keyhole now. We'll probably have a dropout for about a minute and 55 seconds or so and pick you back up again.
Okay. Okay. Do you want the TV to stay on?

That's affirmative. Leave it just like it is. We'll just have a little blizzard for the folks at home and pick you back up again.

Goodstone (Rev 48)

Okay, Spider. We've lost your picture here now. We should be able to pick it back up shortly. I'm curious, if we get the picture back, if you could show us a view out of the overhead window of the command module. Would that be possible?

Roger.

Out the window and up around the tunnel area if you could, and we are showing about 8 minutes left in the pass.

Okay. I'll show you a picture of Dave over in the GunDrop waving at us.

Okay. We do not have your TV picture at this time. I'll let you know when we get it.

Texas (Rev 48)

Okay. Spider, we've got the picture back again now.

I can show you a picture of the back of the LM. I don't know if you could see much back there.

Okay. And just a word, Jim. We'd like to have you hold the camera, oh, about a minute or so in each position, to let the light compensate right. Maybe the picture will come in a little clearer.

Okay. I'll give you the one out of the top first - to make sure we get it.

Okay. Yes. We can see it out - we - It's a good view, Spider.
03 03 06 21  CC  Hey, that's terrific. Dave, how about waving to the folks at home?
03 03 06 34  CC  Hey, that's really great, Spider and Gumdrop. It is really beautiful! And we can see you waving, Dave.
03 03 06 47  CC  Hey, that's really a terrific shot.
03 03 06 52  CDR  Tell you what I'll do. I don't know if it is still light out there, maybe I can give you a view out the top window of the IM down at the light.
03 03 07 00  CC  All right. Yes. Let's do that. And we've got about 6 minutes left. That's really great.
03 03 07 09  CDR  Well, I can't see much out there. I'll show you one of our quads.
03 03 07 15  CC  Hey, that's a terrific shot. You know that camera picks up pretty well even when you are moving it fast. And that's a beautiful shot of the quad now. Jim.
03 03 07 30  CDR  Okay. Now I'll show it right straight down the minus X-axis, or as close as I can get it, and you can just see the legs sticking out down there.
03 03 07 45  CC  Okay. The picture is pretty good, Spider. It's real clear. I'm not sure I can pick out the leg right there at this time. We'll take a look at it.
03 03 07 56  CDR  That's okay. Neither can I. You don't see very much of it, Smokey.
03 03 08 01  CC  Okay. Well, I don't feel so bad then.
03 03 08 04  CDR  Okay. Just a minute.
03 03 08 14  CDR  Let me show you a little more of the outside of the command module. I'll show you the side window, and you can see the EVA light sticking out, out there on the pole. It's also part of the IM radar antenna.
03 03 08 37  CC  Jim, can you move the camera a little closer to the window?
03 03 08 41  CDR  It's right up against the window, now.
Okay.
I'm not sure that you can really see it that well.
Here's a picture of the radiation meter. So far, we haven't detected any radiation.
Oh, very good. Hey, that's a real good picture.
It also might be interesting to look at the front of the IM and the instrument panel.
Yes. That would be real great. If you could show us a couple of views of that, and maybe one of up in the tunnel, so we can see how you get in and out of there on your way to work each morning.
Okay. This is the interim stowage assembly that we are looking at right here. Instrument panel is right behind it. For the EVA, we put all of our equipment in that big bag. You can see the telescope sticking out right above that with all the wires wrapped around it.
Okay, Jim. We can see where it is. It's just a little dark to show the AOP up real good, but we've got a real clear picture of your stowage bag.
Okay. Maybe I can take a diagonal picture of the instrument panel here.
Spider, I got the docking target up here. Why don't you try that?
Okay.
Smokey, can you see this picture?
Okay. We can see the caution and warning panel with a couple or three lights lit up, but it is just a little dark on the panel itself.
Okay. Listen, we'll go back, and I'll show you the docking target. It is green and yellow; too bad we don't have green and red. Too bad we don't have color TV. It is in the command module window now.
Okay. That will be a good shot if we can get through to that.

Oh, hey. That picture is fantastic, Dave - I mean Jim. Let's just hold it right there for awhile.

That's really a terrific shot, Jim. We are getting the earth in the background and the clearness of the command module is outstanding.

It's a clear command module.

Roger.

I guess I should say, "The Gumdrop looks loud and clear."

Okay, Jim. We've got about a minute and a half left. That picture looks beautiful.

Okay.

And could we give it a try up the tunnel? It's probably pretty dark, but we'd like to see how it comes in.

Hey, I'm not sure. Say, Dave, is the tunnel pressurized or not?

Yes. It's pressurized.

Okay. It's still ... We don't have the tunnel open, and we can't get it open very far because we still have the OPS's on the back wall.

Roger. We understand, Jim.

Okay. There's a picture of the drogue sticking down into the tunnel with the probe stuck in the end of it, and you can see the upper hatch of the LM is open. It's probably not - -

Now hold the camera right there, Jim. That's real clear. It's a beautiful picture.
(GOSS NET 1)

03 03 12 33  CDR  (GUMDROP)  Okay.  Stand by.  And I'll pull the hatch off.

03 03 12 36  CC  Okay.

03 03 12 45  CC  It's really a clear picture, Jim.

03 03 12 51  CDR  (SPIDER)  I'll tell you, the picture we really ought to have for you are those six black hoses in the LM, or if in the command module snaking around three people who are trying to do something.

03 03 12 59  CC  Roger.  Understand.  We're going to lose you here. Tell Dave to delay taking out the hatch. We're just about to drop you.

03 03 13 10  CDR  (SPIDER)  I think it's out now.  I don't think you can see anything.

03 03 13 13  CC  No.  We've lost the picture.  That's the end of the pass.  Right on schedule.

03 03 13 17  CDR  (SPIDER)  It works.

03 03 13 18  CC  Hey, we sure appreciate your taking that time out, Jim.  That was great.

VANGUARD (REV 48)

03 03 14 24  CC  Apollo 9, this is Houston - excuse me, Spider; Gumdrop, Houston.  We should still have COMM with you.  How do you read?

03 03 14 33  CDR  (SPIDER)  Spider, loud and clear.

03 03 14 34  CDR  (SPIDER)  Gumdrop, five-by.

03 03 14 36  CC  Okay.  Spider, we've got you for about another 5 minutes here before we fold up and turn off.  After that we'll be able to argue as to who's going to get up for tomorrow's work.  What is - is it just getting on the suits and hoses and everything that's giving you the delay in the morning?

()}
03 03 14 55  CDR (SPIDER)  Yes. The problem is that although we've got three people in there, we can't have all three guys working at the same time. And once you put your suit on, you become sort of useless. And everybody has to eat, and we have to get the suits on, we have to power up the spacecraft, we probably have to take them through a P52 or P51, and by the time you get through doing all those things, it just takes up 2 or 3 hours.

03 03 15 19  CC  Roger. Understand. We're starting the rest period tonight at 77:30 - right about that - which is an hour and a half early. And as far as tomorrow morning goes, do you agree with getting up an hour and a half before the scheduled time? Is that going to give you enough time?

03 03 15 42  CDR (SPIDER)  I think maybe if we did some more work tonight, we might be able to get up something like an hour beforehand tomorrow. The trouble is we were up pretty late last night trying to sort out all the things. As you know, we transferred the checklist back and forth, and flight plans back and forth; it's really kind of a mess. I guess the thing that we can plan on doing is getting up something like an hour ... checklist squared away, and then we'll be ISA UP for tomorrow morning tonight. I just hope we can get it all done in an extra hour. I tell you what, I have to look at tomorrow morning's flight plan before I can tell you. I'll let you know exactly what we are going to do.

03 03 16 26  CC  Roger. Spider, do you still read me?

03 03 16 35  CMP (GUMDROP)  Houston, Gumdrop's still with you.

03 03 16 37  CC  Okay, Gumdrop. Spider sort of faded out there. We agree with that. We're going to do everything we can to get you turned in as soon as possible tonight, and we agree to the hour in the morning for getting up earlier and guess we can discuss it more later, but we sure concur with all those.

03 03 17 00  CMP (GUMDROP)  Okay. Very good. We'll take a look at the flight plan later on, too, and get it all squared away.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 03 17 05</td>
<td>CC</td>
<td>All right. Fine.</td>
</tr>
<tr>
<td>03 03 17 14</td>
<td>CMP</td>
<td>Spider, Gumdrop.</td>
</tr>
<tr>
<td></td>
<td>(GUMDROP)</td>
<td></td>
</tr>
<tr>
<td>03 03 17 16</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td></td>
<td>(SPIDER)</td>
<td></td>
</tr>
<tr>
<td>03 03 17 17</td>
<td>CMP</td>
<td>Roger. They copied. They agree with all that.</td>
</tr>
<tr>
<td></td>
<td>(GUMDROP)</td>
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<tr>
<td>03 03 17 20</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
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<td></td>
<td>(SPIDER)</td>
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<tr>
<td>03 03 19 38</td>
<td>CDR</td>
<td>Gumdrop.</td>
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<tr>
<td></td>
<td>(SPIDER)</td>
<td></td>
</tr>
<tr>
<td>03 03 19 41</td>
<td>CMP</td>
<td>Go ahead.</td>
</tr>
<tr>
<td></td>
<td>(GUMDROP)</td>
<td></td>
</tr>
<tr>
<td>03 03 19 42</td>
<td>CDR</td>
<td>Find out what we do with the super ... whether we leave it here or bring it back.</td>
</tr>
<tr>
<td></td>
<td>(SPIDER)</td>
<td></td>
</tr>
<tr>
<td>03 03 19 47</td>
<td>CMP</td>
<td>Okay. Stand by.</td>
</tr>
<tr>
<td></td>
<td>(GUMDROP)</td>
<td></td>
</tr>
<tr>
<td>03 03 19 53</td>
<td>CC</td>
<td>And, Spider; Gumdrop, if you read Houston, we're deleting the backup C024 check over Ascension.</td>
</tr>
</tbody>
</table>

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

ASCENSION (REV 48)

03 03 25 42  CC Gumdrop/Spider, this is Houston through Ascension. And we are deleting this backup voice check.

03 03 25 50  CMP (GUMDROP) Roger.

03 03 25 58  IMP (SPIDER) And, Houston, this is Spider. As soon as we get the tunnel clear, we're going to be transferring back and drawing out the trouble meter.

03 03 26 05  CC Roger. We agree with that. We'll just be standing by.

03 03 32 07  CC We'll see you over Tananarive at 42.

TANANARIVE (REV 48)

03 03 42 36  CC Spider/Gumdrop, Houston through Tananarive. Standing by. We will have you for about 4 minutes; see you at Carnarvon at 56.

03 03 42 45  CDR (SPIDER) Spider.

03 03 43 01  CDR (SPIDER) Hey, Dave, how would you like to have us mix up this fruit plate with this LM water?

03 03 43 07  CMP (GUMDROP) I think that would be all right.

03 03 43 10  CDR (SPIDER) Okay. Should make it a lot better.

03 03 43 12  CMP (GUMDROP) Yes. I wouldn't mind having some of that.

03 03 43 18  CMP (GUMDROP) Good idea.

CARNARVON (REV 48)

03 03 56 12  CC Spider/Gumdrop, Houston through Carnarvon. Standing by.
Roger, Houston. Spider here. We've started to dry out.

Roger. Understand.

And, Rusty, could you give us a time on when you started?

Roger. On my Mark, we started 6 minutes and 40 seconds ago. 3, 2, 1.

MARK.

Six minutes and 40 seconds into the dryout.

Very good; thank you, Rusty.

Roger.

Spider, Houston.

Roger. Go ahead, Houston.

Roger. Just to verify our TM here, Rusty. Several times we've noticed connects and disconnects of the suit isolation valve, the suit isolation valve, going from connect to disconnect. Can you verify that?

The commander just went off, and we disconnected his.

No, I mean this was during the day.

Yes. I guess we did it about four or five times today.

Okay. And are you connected now?

That is affirmative. The LMP is connected and flowing, and the Commander is not.

Okay. That solves our problem, then. Thank you, Rusty.

Spider, Houston.

Go ahead.
Roger. We're recommending that you be off of the LM ECS hoses by 76 plus 10. That's about 8 minutes from now, if you can make it. We would also like the time at which you do go off. It's about 1 minute to LOS here at Carnarvon, and I'll probably see you over Hawaii around 21.

Okay. I'll be on the command module hoses by that time.

And, Spider, one more question. Could you — Would you have time to tell me whether the suit isolation disconnect circuit breaker is IN or OUT?

Suit flow control circuit is CLOSED. I believe that's what you want.

That's what I wanted, Rusty; thank you. It's closed.

Roger.

Gumdrop/Spider, this is Houston through the Huntsville. I'll have you about 2-1/2 minutes. And Gumdrop, do you read?

This is Spider here. Go ahead.

Okay. Could you pass the word to Gumdrop there that we will pick him up — We'll pick y'all up over Hawaii in about 8 minutes at 21. The first item will be some block data that we would like to get out of the way, and then we'll have some questions on the optics and on the cryo plan for tonight.

Roger. When did you say you were going to do that?

We'll do that over Hawaii — coming across the States — We'll have Hawaii at 21, and we would like to have them to have their block data PAD out.
Okay. We'll be all set.

Okay. And, Gumdrop, we're trying to do some COMM troubleshooting here. This will be VHF only at Hawaii, if we can make it. And I'd like to insure that your VHF is set up.

Okay. All set; VHF only.

HAWAII (REV 48)

03 04 21 20 CC Hello, Spider/Gumdrop, Houston through Hawaii.

03 04 21 25 SC Roger. Standing by.

03 04 21 42 CC Gumdrop, do you read Houston?

03 04 21 45 CDR ... Houston. Never mind. We're reading you.

03 04 21 50 CC Roger. Copy. Stand by.

03 04 22 54 CMP Houston, Apollo 9.

03 04 22 57 CC Roger. Apollo 9, this is Houston. I think I've got you a little better now. How do you read me?

03 04 23 05 CMP I'm picking you up five-square. Go ahead with your block data.

03 04 23 08 CC Okay. Reading block data: 051 Alfa, plus 307, minus 1619 080 49 10 4651; 052 3 Baker, plus 333, plus 1485 082 12 23 4710; 053 3 Alfa, plus 316, plus 1485 083 46 06 4663; 054 3 Baker, plus 259, plus 1450 085 19 30 4601; 055 Charlie Charlie, minus 210, minus 1620 087 11 08 4475; and the last one, 056 Alfa Charlie, plus 014, minus 0240 087 47 06 4580. And your SPS trim: pitch, minus 1.07; yaw, minus 1.11. End of update.

03 04 26 19 CMP Roger. I missed the first 2 lines of the third one.
Okay. The first two lines of the third one:
053 3 Alfa, plus 316.

Okay. Coming back at you. Ready?

Okay. The first two lines of the third one:
053 3 Alfa, plus 316.

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?

Okay. Coming back at you. Ready?
03 04 30 22   CC   Okay. You're loud and clear. Are you ready to copy a NAV check?
03 04 30 26   CMP (GUMDROP)   Roger. Go with the NAV check.
03 04 30 28   CC   It's 077 all zeros all zeros, minus 0735, minus 02499 1272.
03 04 30 55   CMP (GUMDROP)   Roger. 077 all zeros, minus 0735, minus 024 - and I didn't catch the rest - 1272!
03 04 31 08   CC   Roger. The longitude is minus 02499.
03 04 31 16   CMP (GUMDROP)   Minus 02499.
03 04 31 19   CC   That is affirmative. And, Dave, if you've got time, there's a couple of questions I'd like to ask you about the optics.

GOLDSTONE (REV 48)

03 04 31 38   CMP (GUMDROP)   Hey, Houston.
03 04 31 46   CC   Gumdrop, this is Houston. Could you give us POO in ACCEPT, please? We're going to uplink you a state vector.
03 04 32 27   CC   Hello, Gumdrop; this is Houston. How do you read me now?
03 04 33 11   CC   Okay. Gumdrop, this is Houston. I think we've got you again, now. How do you read?
03 04 33 16   SC   ...
03 04 33 54   CC   Okay. Gumdrop, Houston trying again. Do you read?
03 04 33 58   CMP (GUMDROP)   Okay. I read you again; how me?
03 04 34 00   CC   Oh, boy; you are loud and clear now. I don't know what our COMM troubles are, but we've got them. I'd like to talk to you a little bit about the cryo plan for tonight.
03 04 34 11   CMP (GUMDROP)   Okay. Go.
Okay. We'd like this to be done just before you go to sleep, and you are going to have to allow about 30 minutes. What we'd like to have you do is bring both H₂ tanks up to 270 psi, using manual operation of both heaters and fans in both tanks. This 270 psi in tank 2 flow should correspond to the caution and warning trip limit, so you should get a light on that. Then after you've got the pressure up, we'd like to have you turn fans OFF, and place heaters in AUTO.

Okay. Copied that. You want both H₂ up to 270 with both the heaters and the fans. And then, when you get there, the fans OFF and the heaters to AUTO. And expect a caution warning light on tank 2 at 270.

That's right. And this should be done just before your sleep period; you should allow about 30 minutes for this.

Okay. Understand.

Dave, can you answer a couple of questions about your optics?

Go ahead.

Okay. This is in regard to the problem you stated the other day about the telescope sticking in 64 degrees in MANUAL drive.

Roger.

Okay. Is that shaft counter permanently frozen at 64, or when you get it past 64, does it count again?

No. The mechanical counter is permanently frozen.

Okay. It is frozen. The way we copied it, you went to AUTO OPTICS to get past 64. Is that correct?

Not - Yes, that's one way; it was a sort of transient kind of thing. The feedback readou
froze the day before, but we didn't notice any slowness up. Then on the morning when I realigned, when I came - just before I gave you the comments - I got stuck in 64 one time, but got it past and haven't had any trouble since.

Okay. Understand that you do not have any trouble with it now, with the exception of the counter being at 64 degrees.

That's affirmative. I've done two more alignments since then, and I've run back and forth across about the 60-degree point, and it doesn't seem to hang up any more.

Okay. That's real good. We really were scratching our heads on that one. So, it sounds like you are squared away for tomorrow, then.

Yes. I believe it's working all right, and the CMG AUTO drive seems to work fine, too.

Okay. Real fine; that helps us out. At this time I would remind you of the waste water dump, which we are showing down here at about 77:30; and we're showing your rest period starting right after, about 77:40.

All right; thanks for the reminder. We'll even try and chlorinate the water before we go to bed.

Okay. Very good.

And, Gumdrop, also we would like to remind you, sometime we would like to get a dosimeter reading.

Okay. We'll get that.

And, Gumdrop, we're through with the computer. It's yours.

Roger.

Houston, Gumdrop. I've got the dosimeter readings, if you want them.

Roger. Right. Go ahead.

Okay. 3112, 6112, 8012 for the CDR, CMP, and LMP.
03 04 39 44  CC  Roger. I copy those, Gumdrop. Thank you very much.

03 04 40 16  CC  And, Gumdrop, is Rusty still over in the LM?

03 04 40 20  CMP (GUMDROP)  Roger. We're sort of cleaning things up and fixing chow with some good water in it?

03 04 40 26  CC  Okay. Real good. I'll get with him later, then. There is a note I want to give about the check-list - his malfunction procedure.

03 04 40 35  CMP (GUMDROP)  Okay. He ought to be back over in about a half hour or so.

03 04 40 38  CC  Okay.

ANTIGUA (REV 49)

03 04 44 24  CC  And, no need to answer, Gumdrop. This is Houston. Just like to remind you, you are still in ACCEPT. We would like to have you go back to BLOCK whenever you get around to it.

03 04 44 32  CMP (GUMDROP)  Okay. Thank you. Good night.

03 04 44 35  CC  Roger.

03 04 44 57  CMP (GUMDROP)  Hello. Houston, Apollo 9.

03 04 45 00  CC  Go ahead, Apollo 9.

03 04 45 02  CMP (GUMDROP)  I've got a question for tomorrow. When we finish up with the LM, we are collecting a tremendous amount of garbage and stuff in the command module here, and we have to bring a bunch of books and things like that back from the LM. I'd like to take one of these great big temporary storage bags, fill it with all our garbage, and leave it in the LM. This means that the doctors aren't going to be able to figure out when we ate, because all the white spots, and red spots, and blue spots of the food bags are going to be over there in the LM. But we've been intermixing bags and stuff here,
Houston, in an attempt to get something to eat whenever we can, so that data is sort of gone down the tubes anyway.

Roger, Apollo 9. We copy that.

Okay. Could you let us know if we could drop off a couple of big bags of junk over there?

Roger. Why don't you go ahead and do it?

That was sort of my plan, too, Stu.

Say again, Apollo 9.

I said, that was sort of my plan, too.

Roger. That's the official word. Go ahead. We would just like to caution you: could you sort of fasten it down with one of the restraints or something?

Yes. We'll have it fixed so it doesn't float around, but we've just got to get rid of some of this junk.

That sounds like a great idea.

We just haven't had much time for playing housekeeping, and it's really building up.

We appreciate that. You all are doing a magnificent job, and we're really pulling for you.

Right now, we are filling all our bags full of water from the LM because that water tastes better.

Roger. Understand the water in the LM is much, much better than that in the command module.

Yes. It doesn't have any bubbles, and you can drink it without blowing up like a balloon.

Hey, that sounds great.

Yes. But you ought to see where they go when they ask for a soda.

Of course, I guess it's a little inconvenient to always pull that LM around just so you will have good water to drink, isn't it?
03 04 47 10  CMF (GUMDROP)  Yes. It's sort of going to be in the way after tomorrow.
03 04 47 13  CC  Roger.
03 04 47 15  CMF (GUMDROP)  Besides which, I'm getting tired of looking at the top of it through the command module windows. It sort of blocks the view.
03 04 47 21  CC  Yes, I guess that cuts down on your geography viewing, there.
03 04 47 26  CMF (GUMDROP)  Man, I haven't even had time to look at the ground yet.
03 04 47 30  CC  Yes. I bet I got more view of the ground today from your TV show than you have so far.
03 04 47 40  CMF (GUMDROP)  The only good view I think I've really had was yesterday during the docked DPS burn when we went across the States face down. That was really quite pretty.
03 04 47 48  CC  Yes, man; that docked DPS burn was a beautiful thing. It was really great.
03 04 50 13  CC  Apollo 9, Houston. One other question.
03 04 50 15  CMF (GUMDROP)  Go ahead.
03 04 50 17  CC  Roger. We would like to verify that the heaters on the LH windows were OFF all day.
03 04 50 25  LMP (SPIDER)  Roger. They were. That's affirmative. They were OFF all day.
03 04 50 29  CC  Okay. Thank you.
03 04 51 42  CC  And, Apollo 9, we are going to lose you here at Antigua. We'll see you over Ascension at about 59.
03 04 51 49  LMP (SPIDER)  Roger.
03 04 51 53  LMP (SPIDER)  Hey, Houston, it looks like we're all done drying out the water boiler. What do you think?
03 04 52 00  CC  Stand by, Apollo 9.
That's negative. We don't think it's dry yet, Apollo 9. We will try to get you a hack, here, on our estimate.

Okay. Very good.

Apollo 9, Houston. In about 5 more minutes, if you read me, you can shut down the water boiler. I mean, it will be dried up.
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(TAPE 50/1)

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ASCENSION (REV 49)

03 04 59 25 CC Apollo 9, Houston.
03 05 00 15 CC Apollo 9, Houston through Ascension.
03 05 00 21 CFP This is Apollo 9.
03 05 00 27 CC Apollo 9, this is Houston through Ascension. We've got a question on that sequence camera, Dave. Did we report - record that yours broke today?
03 05 00 38 CFP (GUMDROP) Yes, ... troubleshooting ... pulled out the spare fuse.
03 05 00 50 CC Roger. Understanding that you were troubleshooting, and then you faded out. We will try you again in a little bit.
03 05 00 58 CFP (GUMDROP) I said I put in a spare fuse and fiddled with it, and now it works fine.
03 05 01 04 CC Roger. Understand. Tremendous. And, Apollo 9, what we were considering - to make sure we got the pictures of the undocking and so forth - is that maybe you would like to swap that one with the one in the IM.
03 05 01 21 CFP (GUMDROP) This one's a fine outfit.
03 05 01 27 CDR (GUMDROP) Houston, this is Apollo 9.
03 05 01 29 CC Go ahead.
03 05 01 32 CDR (GUMDROP) I have sort of a climax or summary of what we did today. I think that the procedure that we have worked out for the EVA transfer from one spacecraft to another is no problem whatsoever. The procedures are good, and I think we can plan on using them henceforth if they are needed.
03 05 01 56 CC Roger, Apollo 9. We copy and agree with that. From monitoring in your conversation, it did sound like they were real good. It sounded like the getting in and out of the hatch was quite easy, and I heard Rusty's comments on the handrail. Sounded like they were pretty good.
(GOSS NET 1)

03 05 02 13  LMP
(SPIDER)  Yes. Everything seems to work.

03 05 02 16  CC  Apollo 9, we are ready to shut down. It looks like the water boiler is dried up.

03 05 02 24  CMP
(GUMDRO)  Roger. Very good.

03 05 02 51  CMP
(GUMDRO)  Houston, here comes a TM CAL.

03 05 02 55  CC  Apollo 9, this is Houston. Say again.

03 05 02 57  CMP
(GUMDRO)  Here comes a TM CAL.

03 05 02 59  CC  Okay. Thank you.

CARNARVON (REV 49)

03 05 30 27  CC  Apollo 9, Houston.

03 05 30 31  LMP  Roger. Houston, Apollo 9.

03 05 30 34  CC  Roger. Rusty, got a message for you, if you're ready to copy.

03 05 30 41  LMP  Roger. Stand by. Let me get a book.

03 05 30 43  CC  Okay. It's just a message on the malfunction procedures. You don't need to copy.

03 05 30 49  LMP  Okay. Go ahead.

03 05 30 51  CC  Okay. The message is: we've reviewed the electrical emergency procedure that you and Al came up with prelaunch and IMS and the emergency procedure in the back of the rendezvous checklist. In the light of this review, we recommend that you do not use either of the procedures and use instead the existing malfunction procedures.

03 05 31 13  LMP  On the electrical system?

03 05 31 14  CC  Affirmative.

03 05 31 18  LMP  Okay.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 05 31 19</td>
<td>CDR</td>
<td>Hello, Sonny. How are you?</td>
</tr>
<tr>
<td>03 05 31 21</td>
<td>CC</td>
<td>Fine, Jimmy.</td>
</tr>
<tr>
<td>03 05 31 46</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>03 05 31 48</td>
<td>CMP</td>
<td>Go ahead, Houston. Apollo 9.</td>
</tr>
<tr>
<td>03 05 31 50</td>
<td>CC</td>
<td>Roger. I'm ready to copy the LM batteries, if you've got them there.</td>
</tr>
<tr>
<td>03 05 31 57</td>
<td>CMP</td>
<td>Roger. BATT 1, 2, 3, and 4 all 31 volts; BATT 5 and 6 are 37; command's and systems engineering bus is 31; ED BATT A was 36.5, and ED BATT B was 37.3.</td>
</tr>
<tr>
<td>03 05 32 22</td>
<td>CC</td>
<td>Roger. Copy. BATT 1, 2, 3, and 4 were 31; BATT 5 and 6 were 37; CDR and SE bus is 31, ED BATT A 36.5 and ED BATT B 37.3.</td>
</tr>
<tr>
<td>03 05 32 38</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 05 32 43</td>
<td>CC</td>
<td>If you are at that point yet, we can go ahead and copy the systems stuff from Gumdrop.</td>
</tr>
<tr>
<td>03 05 32 51</td>
<td>CMP</td>
<td>I don't think we've generated that yet.</td>
</tr>
<tr>
<td>03 05 32 54</td>
<td>CC</td>
<td>Okey-dokey.</td>
</tr>
<tr>
<td>03 05 32 55</td>
<td>CMP</td>
<td>... the flight plan a little bit.</td>
</tr>
<tr>
<td>03 05 32 58</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 05 33 02</td>
<td>CMP</td>
<td>It's already 77:33 here, and according to our other scheme, we were going to be to bed in an hour or something like that. It looks like we're going to make it about time 79 hours, just like in the regular flight plan here.</td>
</tr>
<tr>
<td>03 05 33 21</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 05 33 23</td>
<td>LMF</td>
<td>... early tomorrow.</td>
</tr>
<tr>
<td>03 05 33 25</td>
<td>CC</td>
<td>Going to get up early tomorrow?</td>
</tr>
<tr>
<td>03 05 33 28</td>
<td>CMP</td>
<td>Roger. Normally, we're supposed to get up over Ascension about 86:30. I recommend we get up over Guam at about 85:40.</td>
</tr>
<tr>
<td>03 05 33 38</td>
<td>CC</td>
<td>Roger. I'll get the parents to get you up about 85:30 or 40.</td>
</tr>
</tbody>
</table>
(GOSS NET 1)

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 05 33 42</td>
<td>CMP</td>
<td>Okay. Fine. We'll try to organize the spacecraft so we're in better shape tonight before we go to bed so we'll be able to get over there, but I don't want to stay up all night doing it either. So we'll just have to wait and see.</td>
</tr>
<tr>
<td>03 05 34 04</td>
<td>CC</td>
<td>Roger. Understand. Are you going to stow away any of your stuff to put it in the LM for tomorrow?</td>
</tr>
<tr>
<td>03 05 34 09</td>
<td>CMP</td>
<td>Roger. We're still putting the spacecraft back together; getting the drogue, the probe, and stuff like that in the tunnel and rearranging the other stuff.</td>
</tr>
<tr>
<td>03 05 34 30</td>
<td>CC</td>
<td>Okay. Are you going to have a chance to get the spacecraft batteries and service module RCS readouts for us?</td>
</tr>
<tr>
<td>03 05 34 35</td>
<td>CMP</td>
<td>I'll get that for you in just a minute.</td>
</tr>
<tr>
<td>03 05 34 37</td>
<td>CC</td>
<td>Okey-doke.</td>
</tr>
<tr>
<td>03 05 35 39</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>03 05 35 43</td>
<td>CDR</td>
<td>Go ahead, Houston.</td>
</tr>
<tr>
<td>03 05 35 44</td>
<td>CC</td>
<td>You can go AUTO on the heaters now and turn the fans off.</td>
</tr>
<tr>
<td>03 05 35 51</td>
<td>CDR</td>
<td>Okay. AUTO on the heaters and turning the fans off.</td>
</tr>
<tr>
<td>03 05 35 54</td>
<td>CC</td>
<td>Yes. On the H₂ tanks.</td>
</tr>
<tr>
<td>03 05 35 58</td>
<td>CDR</td>
<td>Roger. H₂ heaters.</td>
</tr>
<tr>
<td>03 05 36 08</td>
<td>CC</td>
<td>Roger. Apollo 9, Houston. We're going to lose you here for a minute, and we'll pick you up at Guam for the systems stuff. That'll be about 1.</td>
</tr>
<tr>
<td>03 05 36 15</td>
<td>CDR</td>
<td>Okay. Fine.</td>
</tr>
</tbody>
</table>

GUAM (REV 49)

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 05 43 05</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>03 05 43 23</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>03 05 43 51</td>
<td>CC</td>
<td>Apollo 9, Houston at Guam.</td>
</tr>
</tbody>
</table>
Houston, Apollo 9. Go ahead.

Roger. Apollo 9, Houston. We've got a couple of questions to ask you about the IMU heater. Do you recall placing an IMU standby circuit breaker in?

Roger. The IMU standby circuit breaker has never been out to my knowledge.

Roger. I also have a question on opening the translunar bus tie circuit breaker. Did you open those before you got out?

I believe not. I believe they are closed.

Roger. We might have some word on that in a minute.

Roger.

Apollo 9, Houston.

Go ahead, Houston.

Roger, Rusty. The problem with IMU heater is that we're not seeing it cycling down here, and apparently with the translunar bus tie circuit breakers in, you get a ground return path, and they don't see the total load that's going into the IM. So, they are investigating a little further right now to see if they can discern some cycling on the IMU heater.

Roger. Understand. When do you think we'll have some word?

We should have it here very shortly for you. In the meantime, we can copy that systems stuff if you have it ready, Dave.

Dave is still closing out the tunnel; that's why we'd like to know. He's stopped work right now.

Roger. Understand.

It's already all closed. I beg your pardon.

Apollo 9, Houston.

Go ahead, Houston.
Roger. We're taking a look at all of the bus currents down here now, Rusty, and we won't have a good story for you until you get to Hawaii on whether the thing is okay for tonight or not.

Okay.

The initial interpretation down here right now is that the IMU is cycling, and they are seeing some variations in the currents now. It looks initially like it's probably okay.

Okay. Thank you.

HAWAII (REV 49)

Houston, Apollo 9.

Apollo 9, Houston. Go.

Okay. Ready to copy the systems readout?

Go.

Okay. QUAD quantities A, B, C, D: 75, 77, 71, 72; BATT C, 37.0; pyro A and B, 37.1. Command module quad temperatures: all of them are OFF SCALE HIGH, except 6 Charlie, which is 4.6.

Roger. Copy. Quantities A, B, C, and D: 75, 77, 71, 72; BATT C, 37.0; pyro BATT A, 37.1; pyro BATT B, 37.1. And injector temperatures all OFF SCALE HIGH, except 6 Charlie, which is 4.6.

Roger.

Apollo 9, Houston. We'd like for you to confirm that you're all in COM basic on the audio centers.

I can't tell what Dave is ...

We have one man out - off the - in his altogether, if that's what you wonder.

Roger.

Roger. That answers that question. Like to talk for a minute about this IMU heater. Looks like
all the currents they are reading down here are about the same as they were reading last night. However, with the translunar bus ties closed, if there is anything else pulling current in the IM, it won't show up on their monitoring down here to the extent they can tell what's going on. So we're trying to come to a decision now on whether to recommend going back up in there and opening up those circuit breakers or not.

03 05 58 41 CDR Okay.
03 06 01 32 CC Apollo 9, Houston.
03 06 01 36 CDR Go ahead.
03 06 01 39 CC Roger, Apollo 9. We'd like to get some sort of feeling from you, how long you think it would throw you back in the cycle - your sleep cycle - to go back up in there and open the translunar bus ties. We're still working on the data down here, and we can't get any good answer probably until you get to the States. Maybe we could save some time if you just went ahead and did that.

GOLDSTONE (REV 49)

03 06 03 24 CDR Houston, Apollo 9.
03 06 03 26 CC Apollo 9, Houston.
03 06 03 29 CDR Roger. You called just as you had broke lock last time. What was it you called down?
03 06 03 34 CC Okay. We're discussing this IM on your heater problem, and they're still massaging the data down here to see whether we're okay for the night or not. In the meantime, we wanted to get a feeling from you as to how much that would cut into your sleep cycle if you just went ahead and got in the IM and pulled those circuit breakers. I think that the problem is that we really can't give you a good feeling for what you've got with those circuit breakers in. We don't know what other systems are powered up, and we don't have a good way of monitoring what's going on.
Houston, Apollo 9.

Apollo 9, Houston. Go.

Houston, do you read Apollo 9?

Roger. Read you loud and clear. We'll have an answer for you on these circuit breakers in just a minute, Apollo 9.

Okay. Fine.

Apollo 9, Houston.

Go ahead, Houston. Apollo 9.

Roger, Dave. How long would it take you to get back up there and pull those circuit breakers?

It's going to take about 30 minutes to clear the tunnel and go back up there to pull the circuit breakers out and get back to here. That's if we go like mad.

Roger. Okay. The problem down here, Jim, is we don't know what else is on the line right now, and we don't have a good way of monitoring it, with those circuit breakers in. They're able to catch the DMU heater cycling, and most of the systems seem to be okay for the night. But we - There's an uncertainty as to what the configuration is and what's pulling the power at this point.

I don't - What's the uncertainty about what the configuration is?

Houston, I don't understand what the uncertainty is.

Roger. Apollo 9, Houston. Stand by one.

Apollo 9, Houston. The problem is that they're monitoring the command module loads, and they don't know whether the loads that they are reading are command module only or some LM loads which we don't know about at this time.

Okay. I don't think there's any doubt that the DMU standby circuit breaker is in, if that's what they're wondering about.
03 06 09 05  CC  Yes. Roger. And --
03 06 09 11  CDR  Tell you, if we're going to do it, we ought to get going on it and not keep talking about it all night.
03 06 09 15  CC  Yes. That's firm. Let's do it. Stand by one, Apollo 9.
03 06 09 33  CC  Apollo 9, the decision down in here is for you to go pull the circuit breakers.
03 06 09 40  CDR  Okay. What are we going to do about the rendezvous tomorrow?
03 06 09 52  CC  Apollo 9, Houston. I guess we need to know what you want to do about that. We can press along as planned, and it will mean you'll get a half an hour less sleep.
03 06 10 04  CDR  Yes. Minus the other hour we subtracted from it.
03 06 10 07  CC  Roger.
03 06 10 09  CDR  Add all this up and see what it comes to.
03 06 10 16  CC  Say again, please, Apollo 9.
03 06 10 18  CDR  Roger. Let me add up sleep times that we're going to have before tomorrow and see what it comes to.
03 06 10 26  CC  Roger. Copy.
03 06 10 28  CDR  If we went to bed right now, we'd need 7 hours and 30 minutes. We're not going to be in bed for another hour and a half at least.
03 06 11 05  CC  Apollo 9, Houston.
03 06 11 09  CDR  Go ahead, Houston.
03 06 11 11  CC  Roger. It looks like we can probably slip the rendezvous one rev tomorrow morning to make up for the sleep time. We might have some problems with communications and the sites that we have available, but we can work that out through the night.
03 06 11 26  CDR  Well, I don't want to do that. We've got enough problems. If we have any problems during the
rendezvous, we're going to need that extra rev to recover from it.

Roger. Understand.

Look. I don't want to change - I don't want to slip the site times of that rendezvous. We need all the COMM link we can get on this thing, and we need to have that extra rev in there in case something goes wrong. Also, it's going to jeopardize the APS burn and depletion, too.

Roger. Understand.

... we can get this thing done.

Roger.

...

Roger.

Spacecraft range and DCA in tune.

Roger. Thank you.

Apollo 9, Houston.

Houston, Apollo 9.

Okay. Just a couple more things before we turn you loose for the night here, Jim. When you get the circuit breakers open in the LH, you can perform the system test to verify that everything is okay. And if you're ready to copy, I'll give that to you.

We already had those circuit breakers open, Houston. What else do you want now?

Okay. Check system test meter on position 4 Delta, and you should read 0.5 for 25 seconds, then 2.0 for 5 seconds, and if that looks okay, why, we'll skip that one. The second thing is to remind you of the waste water dump down to 25 percent before you turn in for the night.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 06 20 45</td>
<td>CDR</td>
<td>Okay. Very good. And we've already checked \ &amp; Delta, and it looks like it is operating properly.</td>
</tr>
<tr>
<td>03 06 20 49</td>
<td>CC</td>
<td>Roger. And we'll see you in the morning.</td>
</tr>
<tr>
<td>03 06 20 52</td>
<td>CDR</td>
<td>Okay. Adios.</td>
</tr>
<tr>
<td>03 06 20 53</td>
<td>CC</td>
<td>Adios.</td>
</tr>
</tbody>
</table>

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

REST PERIOD - NO COMMUNICATIONS
HAWAII (REV 52)

03 10 44 09 CC Apollo 9, Houston.
03 10 44 28 CC Apollo 9, Houston.
03 10 44 39 CDR Houston, this is Apollo 9.
03 10 44 41 CC Roger. Apollo 9, Houston. Pressure in your H₂ tanks is dropping a little faster than we had anticipated. Sorry to disturb you, but we'd like you to go MANUAL heaters and fans until the pressure goes to 260, and go heaters AUTO and fans OFF so that you won't get a MASTER ALARM.

03 10 45 02 CDR Okay. You want us to go MANUAL heaters and fans on H₂ number 1 until it gets to 265 and go heaters MANUAL and fans OFF.

03 10 45 12 CC Roger. Go to 260, Jim, and then heaters to AUTO and fans to OFF, and that's H₂ tanks 1 and 2.

03 10 45 20 CDR Okay; fine.

END OF TAPE
REST PERIOD - NO COMMUNICATIONS
GOSS NET 1

GUAM (REV 54)

03 13 40 24  CC  Apollo 9, Houston. Good morning.
03 13 40 34  CMP  Good morning.
03 13 40 36  CC  A real short night.
03 13 40 56  CC  Apollo 9, Houston. About 30 seconds to LOS. I'll pick you up at Mercury at 53, and I'll probably have some flight plan updates for you there.

MERCURY (REV 54)

03 13 54 37  CC  Apollo 9, Houston through Mercury.
03 13 54 41  CMP  Apollo 9. Go ahead.
03 13 54 44  CC  Roger, Dave. On your H\textsubscript{2} tanks today: after you've completed the H\textsubscript{2} fan cycle, lock tank 1 heater in AUTO and tank 2 heater OFF.
03 13 55 05  CMP  Okay. Tank 1 heater at AUTO and tank 2 heater OFF, and you want us to run through the cycle again, is that right?
03 13 55 10  CC  Yes, that's after you've completed the fan cycle ON.
03 13 55 26  CMP  Okay. What else do you have?
03 13 55 27  CC  Okay. I have some flight plan updates here, and are you ready to copy?
03 13 55 31  CMP  Roger. Let's go ahead.
03 13 55 32  CC  Okay. Page rendezvous-1: transfer sequence camera that malfunctioned during EVA to LM; leave best camera in command module. Over.
03 13 56 01  CMP  Roger. I understand. Transfer the malfunction sequence camera to LM and leave the good one in the command module.
03 13 56 07  CC  Roger. Okay. And rendezvous-28, add: transfer the extra sequence camera fuse from LM to command module. Fuse is in LM data card kit.
03 13 56 47 CMP Okay. Transfer the camera fuse from the LM to the command module in the LM data card kit.

03 13 56 54 CC Roger. And at time 104 plus 00, waste water dump.

03 13 57 06 CMP 104 plus 00, waste water dump.

03 13 57 09 CC Okay. And then you might note that the LM must be in high bit rate to update the AGS state vector from PCHCS.

03 13 57 36 CC And, 9, Houston.

03 13 57 39 CMP Roger. We hear; I guess we learned that one the other day.

03 13 57 42 CC Yes.

03 13 57 43 CMP I'm just making sure.

03 13 57 44 CC Okay; just making sure. And we've been talking it over down here and you have a GO to transfer to the LM without being connected to the command module umbilicals. That is, you can make the transfer with your helmets and gloves off, if you so desire. Might save a little time, there.

03 13 58 01 CMP Okay. Thank you. We'll do that.

03 13 58 03 CC Okay.

03 13 58 18 CC 9, Houston. We noticed the AUTO switchover to REG 2, and we'd like you to go back to number 1.

03 13 58 26 CMP Well, that's very observant of you. We will do that.

03 13 58 30 CC Okay.

03 13 58 34 CC And we're just about LOS. Ascension at 27. And you might be thinking about it - We can use the rundown on the crew health, sleep, and pills taken in the last couple of days, if you can give it to us there.

03 13 58 49 CDR Okay. Let me ask you a question with the radiators there. Do you think we have a problem, or what?

03 13 58 57 CC We don't know yet, at this time, but I don't think so.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 13 59 01</td>
<td>CDR</td>
<td>Okay. It's manually and — No, it's not a manual radiator operation, but the automatic switch is in RADIATOR 1 now. Okay.</td>
</tr>
<tr>
<td>03 13 59 08</td>
<td>CC</td>
<td>Okay.</td>
</tr>
</tbody>
</table>

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1) Tape 56/1
Page 346

ASCENSION (REV 55)

03 14 27 57 CC Apollo 9, Houston through Ascension. And I have a consumables update.

03 14 28 05 CMP Roger, Houston. Stand by.

03 14 28 08 CC Roger.

03 14 28 37 CMP Okay, Houston. Go with the consumables.

03 14 28 40 CC Roger. GET 086 70 21 69 27 72 29 67 29 450 36 37 34 39 100 97 26 0820 588. Over.

03 14 30 34 CC Apollo 9, Houston. Did you copy?

03 14 30 39 CMP Roger. I missed the third and fourth from the bottom. The percent RCS-B and descent pounds O₂.

03 14 30 48 CC Roger. Percent RCS systems B remaining 97; O₂ is 26.

03 14 31 02 CMP Roger. Coming back; are you ready?

03 14 31 04 CC Roger. Go fast.

03 14 31 07 CMP 086 70 21 69 27 72 29 67 29 450 36 37 34 39 100 97 26 0820 588.

03 14 31 29 CC 9, Houston. Your readback is correct. On that radiator flow control, we'd like to go back to AUTO now and see if it stays in l.

03 14 31 43 CMP Okay. It did.

03 14 31 55 CMP Houston, 9. Do you read?

03 14 31 57 CC Affirmative. You say you went to AUTO?

03 14 32 00 CMP That's affirm, and we're still in l.

03 14 32 02 CC Roger. We copy.

03 14 32 05 CC And, 9, Houston. Did you get my request there on the - your crew status when you get a chance?

03 14 32 12 CMP Roger.

03 14 32 18 CMP Okay. I myself feel fine. Been eating good - no pills and got about 5 hours sleep last night.
03 14 32 26 CC  Roger.
03 14 33 00 CC  Dave, I guess we missed the sleep here night be-
03 14 33 40 CDR  fore, also, if you can remember that.
03 14 33 41 CC  Houston, 9. Are you still with us?
03 14 33 42 CDR  9, go. Roger.
03 14 33 50 CC  Okay. Night before last I got about 7 hours
03 14 33 53 CDR  sleep, too.
03 14 33 54 CC  Roger. Okay. I've got yours now.
03 14 33 58 CDR  Okay. Did you get everybody?
03 14 34 04 CC  Negative. I just got yours and that's all.
03 14 34 13 CC  Really? Okay. I guess I'll let Jim give you a
03 14 34 17 CDR run down on he and Rusty again.
03 14 34 18 CC  Okay.
03 14 34 21 CDR  If you're talking, Jim, I'm not reading you.
03 14 34 31 CDR  Are you reading us now, Houston?
03 14 34 33 CC  I read you, Dave.
03 14 34 34 CDR  Okay. Let me check my friends here.
03 14 34 39 CC  Houston, how do you read?
03 14 34 40 CDR  I got you now, Dave; - Jim; about 40 seconds to
03 14 34 54 CC  Los. In Guam at 08.
03 14 34 54 CDR  Okay. I took an Actifed and two APC before I
went to bed last night and the night before. I
03 15 09 18 CC  got 7 hours sleep the night before last, and
03 15 09 18 CDR  5 hours last night. Rusty took the Second last
night, nothing the night before, and he got
03 15 09 18 CC  7 hours and 5 hours.
03 15 09 18 CDR  Okay. Thank you.

GUAM (REV 55)
03 15 09 27  CMP  Roger, Houston, 9. Go.
03 15 09 30  CC  Roger, Davey. Tell Rusty we've got another new set of GO/NO-GO limits for rendezvous radar check after RCS SEP. Do you want to copy them down?
03 15 09 46  CMP  Okay. Stand by.
03 15 10 41  CC  9, Houston. While you're digging out books there, I've got some block data for you also.
03 15 10 45  CMP  Okay. Give me the PAD's first.
03 15 10 49  CC  Okay. On VERB 83 versus VERB 62, rendezvous radar check after RCS SEP: page 2 and IMP and CDR, rendezvous procedures; change limits R plus or minus 0.27 nautical miles; R dot plus or minus 6.0 feet per second. Over.
03 15 11 37  CMP  Roger. Understand. VERB 83 versus VERB 62, rendezvous radar check: page 2 and IMP and CDR, rendezvous; change limits R plus or minus 0.27 nautical miles; R dot plus or minus 6.0 feet per second.
03 15 11 53  CC  Roger. These are the ones we had before flight. We didn't get a chance to stick in your book there, so you can use your own ideas on them.
03 15 12 02  CMP  Okay. Fine.
03 15 12 05  CMP  What next?
03 15 12 06  CC  Okay. I've got the block data, but before we go into that, it looks like your primary radiator outlet temperature was up to 51 degrees, so it was a valid switch to slow propulsion number 2. And we're still checking it to see what causes it, other than that.
03 15 12 26  CMP  Okay. Fine. Looks like it's up to about 47 or so degrees now.
03 15 12 31  CC  Okay.
03 15 12 33  CMP  Thank you.
03 15 12 40  CMP  Do you want a block data now?
03 15 12 41  CC  Affirmative. If you're ready.
(GOSS NET 1)

03 15 12 43 CMP Just a minute; give me 10 seconds.
03 15 13 00 CMP Okay, Ron. Go ahead.
03 15 13 02 CC Okay. Area 057 Alfa Charlie, plus 115, minus 0319 089 19 18 4094; 058 2 Alfa, plus 263, minus 0270 090 5537 4094; 059 Alfa Charlie, plus 322, minus 0279 092 29 25 4094; 060 1 Alfa, plus 294, minus 0629 093 55 38 4094; 061 1 Bravo, plus 335, minus 0629 095 29 25 4094; 062 1 Bravo, plus 327, minus 0625 097 0312 4094; 063 1 Alfa, plus 272, minus 0630 098 3715 4094. Pitch trim minus 1.07; yaw minus 1.12; and this reflects - no - I say again, no rendezvous maneuvers.

03 15 16 18 CC 9, Houston. About 20 seconds LOS; Huntsville at 17.
03 15 16 27 CMP Okay. I'll read them back to you when we get there. Okay?
03 15 16 31 CC Sure.
03 15 16 33 CMP I think I've got them all, and understand reflect's no rendezvous maneuvers.
03 15 16 37 CC Roger.

HUNTSVILLE (REV 55)

03 15 20 59 CC Apollo 9, Houston over Huntsville.
03 15 21 14 CT Houston, Huntsville lost a valid lock temporarily.
03 15 22 20 CT Huntsville LOS.
03 15 23 09 CT Huntsville valid two-way.
03 15 23 36 CC Apollo 9, Houston. Looks like we got about one and a half minutes LOS; we'll pick you up at Mercury at 26.
03 15 23 46 LMP Roger. Mercury at 26, and you want me to read back some block data.
03 15 23 50 CC Roger. I can read you good enough. Go ahead. I'll get what I can.
Okay. 57 Alfa Charlie, plus 115, minus 0319
089 19 18 0094; 058 2 Alfa, plus 263, minus 0270
090 55 37 0094; 054 1 Alfa Charlie, plus 322,
minus 0279 092 29 25 0093; 060 1 Alfa, plus 294,
minus 0629 093 55 38 4094.

Houston, are you still with us?

Roger. I got you right now, but we're just about
to get you - about 30 seconds yet so - We'll
catch the rest of them over Mercury.

And I think we've lost you.

MERCURY (REV 55)

Apollo 9, Houston through Mercury.

Roger, Houston. Where'd we dropout?

Okay. Start with area 61.

Okay. 061 1 Bravo, plus 335, minus 0629 095 29
25 4094; 062 1 Bravo, plus 327, minus 0625 097
03 12 4094; 063 1 Alfa, plus 272, minus 0630 098
37 15 4094. Pitch trim minus 1.07; yaw trim
minus 1.11; and no rendezvous maneuver.

Roger, Rusty. Your yaw trim there was minus 1.12,
and this reflects no rendezvous maneuvers.

I got you.

Does that reflect the SEP burn at all?

That's negative.

Negative on the set burn also. Right?

Yes. You're sounding pretty chipper this morning.

Yes man, we is hustling.

Houston, Apollo 9.

Houston. Go.
Roger. If we can get into the Lmd a little early, I'd like to do it. Would you check to see what the descent battery power is right now, and see if we've got the margin to get in there a little early?

Roger. We'll check it, and let you know.

Apollo 9, Houston. Roger. There's no problem on descent batteries.

Okay. Thank you.

Apollo 9, Houston. About 30 seconds LOS. We'll pick you up Ascension at 02 - 03.

Roger.

Okay.
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

( G OSS NET 1 )

ASCENSION (REV 56)

03 16 03 30 CC Apollo 9, Houston through Ascension. Standing by.
03 16 03 36 CHP (GUMDROP) Roger. Houston, Gumdrop.
03 16 03 40 CC Roger.
03 16 05 48 CC Apollo 9, Houston.
03 16 05 52 CHP (GUMDROP) Go ahead, Houston.
03 16 05 53 CC Lousy COM here. About 45 seconds to AOS Guam at 44 ...
03 16 06 01 LMP (SPIDER) Okay. Thank you ...

GUAM (REV 56)

03 16 45 22 CC Apollo 9, Houston through Guam. Standing by.
03 16 45 26 CHP (GUMDROP) Roger. Houston, Apollo 9.
03 16 45 28 CC Roger. Loud and clear.
03 16 45 33 CHP (GUMDROP) Houston, how do you feel about the Gumdrop today putting the evap secondary water flow control to AUTOT?
03 16 45 41 CC Roger. We copy. Stand by.
03 16 45 49 LMP (SPIDER) Houston, Apollo 9.
03 16 45 52 CC Houston. Go.
03 16 45 54 LMP (SPIDER) Roger. In case you wonder where we are, we're on page 10, rendezvous 10 of the checklist. It looks like we're running about an hour ahead of schedule.

03 16 46 03 CC Roger. That's good.
(1) (GOSS NET 1) Spider, Houston. High bit rate.
03 16 46 24 CC 9, Houston.
03 16 47 21 CC Go ahead.
03 16 47 23 CMF (GUMDROP) Apollo 9, Houston.
03 16 47 28 CC Go ahead, Houston. Apollo 9.
03 16 49 30 CMF (GUMDROP) Roger. We concur with the swab water control to AUTO for Gumdrop.
03 16 49 32 CC Okay. Did you concur?
03 16 49 38 CMF (GUMDROP) Okay. Thank you.
03 16 49 40 CC Spider and Gumdrop. Thirty seconds LOG. Huntsville at 52, and low bit rate for Spider.
03 16 49 41 CMF (GUMDROP) Affirmative.
03 16 50 20 CC HUNTSVILLE (REV 56) Why don't we go back and try B?
03 16 50 38 CMF (GUMDROP) Okay. Go B.
03 16 51 40 CMF (GUMDROP) Five-square on B.
03 16 51 45 CMF (GUMDROP) Okay.
03 16 51 49 CMF (GUMDROP) Okay.
03 16 51 53 CMF (GUMDROP) Now I don't read you.
03 16 52 07 CMF (GUMDROP) Rusty, did you check all the plugs and stuff? Why don't you unplug and replug?
03 16 52 09 CMF (GUMDROP) Okay.
(GOSS NET 1)

03 16 52 20  LMP  (SPIDER)  Hang on.
03 16 52 21  CMP  (GUMDROP)  Try it anyway.
03 16 52 57  CMP  (GUMDROP)  Loud and clear.
03 16 53 01  CDR  (SPIDER)  Hey, try mine too, will you?
03 16 53 14  CDR  (SPIDER)  Okay.
03 16 53 16  CDR  (SPIDER)  Okay, we can configure both the radio's over here.
03 16 54 02  CMP  (GUMDROP)  Loud and clear.
03 16 54 06  LMP  (SPIDER)  How now?
03 16 54 08  CMP  (GUMDROP)  Loud and clear.
03 16 54 09  LMP  (SPIDER)  Okay. It looks like yours works, Jim.
03 16 54 13  CMP  (GUMDROP)  Well, I'll be a son of a gun. I wonder what makes something like that fail?
03 16 54 18  CMP  (GUMDROP)  I don't know. It's weird, isn't it?
03 16 54 19  LMP  (SPIDER)  Maybe ... to adjust it.
03 16 54 22  LMP  (SPIDER)  Let's get back on the VOX.
03 16 54 23  CMP  (GUMDROP)  Okay.
03 16 54 27  LMP  (SPIDER)  Going off the air. Feed another minute.
03 16 54 28  CMP  (GUMDROP)  Roger.
Apollo 9, Houston through Huntsville. We copied there, but we don't know what you're having trouble with.

Okay, Houston, this is Apollo 9. Apparently both the push to talk buttons on the IMP side of the LM have failed. The one on the cable and also the one on the hand control failed and the only mode of transmission that he had was VOX.

Roger. We'll copy. We'll see if we can't do some troubleshooting for you.

Okay. We checked out the CDR's side and it seems to work okay.

Roger. Copy, Spider.

Reading you loud and clear.

Roger. Stand by on A. I'll try the other antenna here for you.

Okay. How do you read now?

Five-square.

Okay.

I'm on the right.

Apollo 9, Houston. One minute to LOS. Mercury at 00.

Roger.

It appears that the intercom has ... triggered, and yet the tape recorder does not go off. It looks like there's something funny there, too. I'm sorry; I am on VOX, and on VOX the intercom button should not be triggered except when I'm talking and yet the tape recorder does not go off.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 16 57 58</td>
<td>CMP (GUNDROP)</td>
<td>Okay.</td>
</tr>
<tr>
<td>03 16 58 06</td>
<td>LMP (SPIDER)</td>
<td>Okay. The tape has gone off now.</td>
</tr>
<tr>
<td>03 16 58 19</td>
<td>CMP (GUNDROP)</td>
<td>Roger. Data.</td>
</tr>
<tr>
<td>03 16 58 25</td>
<td>CMP (GUNDROP)</td>
<td>Roger. Received your telemetry well.</td>
</tr>
<tr>
<td>03 16 58 30</td>
<td>LMP (SPIDER)</td>
<td>... VOX sensitivity set.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MERCURY (REV 56)</td>
</tr>
<tr>
<td>03 16 59 57</td>
<td>CMP (GUNDROP)</td>
<td>... mess around ...</td>
</tr>
<tr>
<td>03 17 00 16</td>
<td>LMP (SPIDER)</td>
<td>Okay. I guess I might as well leave all that aside.</td>
</tr>
<tr>
<td>03 17 00 19</td>
<td>CMP (GUNDROP)</td>
<td>Okay. Just a minute.</td>
</tr>
<tr>
<td>03 17 00 39</td>
<td>CC</td>
<td>Apollo 9, Houston through Mercury. Standing by for POO in ACCEPT.</td>
</tr>
<tr>
<td>03 17 00 44</td>
<td>CMP (GUNDROP)</td>
<td>Roger. You have POO in ACCEPT.</td>
</tr>
<tr>
<td>03 17 00 48</td>
<td>LMP (SPIDER)</td>
<td>And Spider is on also, Houston.</td>
</tr>
<tr>
<td>03 17 00 52</td>
<td>CC</td>
<td>Roger. Got you, Spider.</td>
</tr>
<tr>
<td>03 17 02 03</td>
<td>LMP (SPIDER)</td>
<td>Houston, Spider.</td>
</tr>
<tr>
<td>03 17 02 05</td>
<td>CC</td>
<td>Spider, Houston. Go.</td>
</tr>
<tr>
<td>03 17 02 06</td>
<td>LMP (SPIDER)</td>
<td>Roger. For your information the commander is - OCS is 5600 psi. I'm checking them out right now, so I'll read you the stuff.</td>
</tr>
<tr>
<td>03 17 02 17</td>
<td>CC</td>
<td>Okay. Go.</td>
</tr>
<tr>
<td>03 17 02 51</td>
<td>CC</td>
<td>Spider, Houston.</td>
</tr>
</tbody>
</table>
03 17 02 54 I.M. (SPIDER)  Roger. Go ahead.

03 17 02 55 CC  Roger. We'd like your CSM to LM power transfer time.

03 17 03 03 I.M. (SPIDER)  Roger. I think Gumdrop can probably give that to you a little bit better.

03 17 03 14 CC  Roger.

03 17 03 16 I.M. (SPIDER)  An hour ahead, Houston. That's pretty good; that's within 5 minutes.

03 17 03 20 CC  Okay. We'll take that.

03 17 03 22 CMP (GUMDRO)  That's a good number.

03 17 03 28 CC  And I have your rendezvous PADS down there for the Spider and Gumdrop, if you're ready to copy.

03 17 03 36 CMP (GUMDRO)  Gumdrop's got to stand by.

03 17 03 38 CDR (SPIDER)  What is it you want to give us, Houston?

03 17 03 41 CC  Your rendezvous PAD for your DAP data load.

03 17 03 54 I.M. (SPIDER)  Stand by. Spider too. Gumdrop, let me know when you're ready.

03 17 03 53 CMP (GUMDRO)  Okay.

03 17 04 45 I.M. (SPIDER)  Okay. Spider is ready to copy anything you've got there, Houston.

03 17 04 53 CC  Okay, Spider ready. Gumdrop, are you ready?

03 17 05 08 CMP (GUMDRO)  Houston, before we start on this ... is ... that you're going to give us?

03 17 05 13 CC  Roger. This is your rendezvous PAD for your DAP data loads, CSM weight, and trim angles.

03 17 05 24 CMP (GUMDRO)  Okay. Gumdrop's ready.
Roger. I'll go. CSM weight: 27 009; LM weight: 22.145; for Spider, GDA drive angles Rf: pitch, 00428; roll, 00730; CSM trim angles: pitch, minus 1.00; yaw, minus 1.10; DELTA-Vc, 16.1. Over.

That's - I'm sorry, that's SPS tail-off instead of DELTA-Vc.

And, Houston, would you repeat the CSM weight, please?

CSM weight: 27 009.

Okay. Readback on the LM weight.

Let's --

LM weight: 22.145; CSM weight: 27 009; Spider trim angles are plus 00428, 00730.

Houston. Roger.

And for the Gumdrop, I have pitch trim of minus 1.00, yaw trim of minus 1.10, DELTA-V tail-off at 16.1.

Roger. Spider, you might make sure your LMP audio control switch is in NORMAL.

Did you get that, Gumdrop?

Negative. He faded on me, too.

Okay.

Spider, Houston. Low bit rate.
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

03 17 40 38 CC Spider/Gumdrop, this is Houston through Canaries.

03 17 40 42 LMP Go, Houston. This is Spider. Reading you loud
(SPIDER) and clear.

03 17 40 44 CMP Gumdrop.

03 17 40 48 CC Roger. I copy both you and Gumdrop. We want
(GUMDROP) to update your Y-PIPA and, since we've got the
REFSM46 in there, we'll just have to punch it
in manually. Do you want me to give you the
address or do you want us to do it?

03 17 41 03 CMP Roger. I'm up in the tunnel; why don't you all
gumdrop.

03 17 41 09 CC Say again, Gumdrop.

03 17 41 11 CMP Roger. I said, I'm up in the tunnel. Why don't
(GUMDROP) you all go ahead and do it?

03 17 41 15 CC I think that's a sterling idea. We'll --

03 17 41 28 CMP You've got POO in ACCEPT!

03 17 41 28 CMP You've got POO in ACCEPT!

03 17 41 30 CC Roger. Thank you, Gumdrop.

03 17 42 39 CMP Houston, Gumdrop.

03 17 42 40 CC Go, Gumdrop.

03 17 42 42 CMP Spider's calling you.

03 17 42 42 CMP Spider's calling you.

03 17 42 45 CC Spider, this is Houston. Say again. I'm not
(SPIDER) reading you at all.

03 17 42 50 CDR Do you read now?

03 17 42 51 CC Roger. I'm reading you loud and clear now, Jim.

03 17 42 54 CDR Okay. I'd like to report that the heater indi-
(SPIDER) cator on my CPS does not come on. I'm planning

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transfer. We just got an AGS caution and warning light on. I don't know how long it's been up there. I just got suited up and turned around here.

03 17 43 14 CC Roger, Spider. I copy both those and we see the AGS warning light. We'll give you some words on it.

03 17 43 22 CDR (SPIDER) Okay. Roger, Stu. The AGS light did not light off a MASTER ALARM except when I turn the AGS on. My guess is that the AGS light came on and stayed on when I activated the AGS, but there's no way I can be sure of that.

03 17 43 42 CC Roger, Spider. Copy.

03 17 43 51 CDR (SPIDER) For your information, Houston, we're doing the pressure integrity check. We're just starting the pressure integrity check right now.

03 17 43 59 CC Roger, Spider. Copy.

MADRID (REV 57)

03 17 44 52 CC Gumdrop, this is Houston. We're through with the uplink. Your Y-PIFA has been updated and the computer is yours.

03 17 45 00 CMP (GUMDROP) Roger. Thank you.

03 17 47 28 CC Spider/Gumdrop. Bring up your S-band for Madrid.

03 17 48 03 CC Gumdrop, this is Houston. Do you read?

03 17 48 40 CC Spider, Houston. If you read, Rusty, check your suit isolation valve. We're showing it disconnected.

MERCURY (REV 57)

03 18 35 39 LHF (SPIDER) Hey, Gumdrop. Attitude ... hold is no longer required and any time you get a chance get an 0820 and --
03 18 36 50  CMP (GUMDROP) Roger. 3, 2, 1.
03 18 35 52  CMP (GUMDROP) MARK.
03 18 35 53  LMP (SPIDER) Give us another 3, 2, 1, Mark.
03 18 35 56  CMP (GUMDROP) 3 ...
03 18 36 00  LMP (SPIDER) Okay. Now give us another readout.
03 18 36 02  CMP (GUMDROP) Okay. 14735, 28980, 34653.
03 18 36 15  LMP (SPIDER) Let me see if I got those. 14735, 28980, 34653.
03 18 36 24  CMP (GUMDROP) That's correct.
03 18 36 26  LMP (SPIDER) Okay. Thank you.
03 18 36 27  CMP (GUMDROP) Roger.
03 18 36 29  CC And, Spider and Gumdnap, this is Houston through the Mercury. Have you about 4 minutes, and I copied the CSM angles.
03 18 36 36  LMP (SPIDER) Okay. Are you ready for the IM angles?
03 18 36 38  CC Go ahead.
03 18 36 41  SC I'm going into the high bit rate for you first. IM angle: 15476, 01907, 01305.
03 18 36 55  CC Roger. I'll read those back in just a second. We'd like to have a E memory dump. We're standing by any time on your Mark.
03 18 37 02  CDR (SPIDER) Okay. Stand by just one. Let us finish up the dock alignment procedure, and we'll be right with you.

That's Charlie.

Okay. We'll go to work on some angles.

Houston, Gumdrop.

Gumdrop.

Have my gyro torqueing angles if you're ready.

I'm ready.

Roger. GET: 90 31 30, plus 01 097, minus 00 363, plus 00 193.

Roger, Gumdrop. I copy.

Roger.

Okay. Here we come with the E memory dump, if you're ready, Houston.

We're rocking on ready. Go ahead.

Roger. 3, 2, 1.

MARK.

E memory dump.

Houston, Spider.

Go ahead, Spider.

Roger. I just noticed that we don't have R and D instrumentation B closed - or we did not have it closed for that E memory dump. Do you want to re-do that?
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 18 39 43</td>
<td>CC</td>
<td>We'd like to have the E memory dump again. We had a drop out of telemetry, and stand by.</td>
</tr>
<tr>
<td>03 18 39 52</td>
<td>CC</td>
<td>Disregard the circuit breaker; let us have the E memory dump.</td>
</tr>
<tr>
<td>03 18 39 57</td>
<td>LMP (SPIDER)</td>
<td>Okay. I understand. Negative on the R and D B, and another E memory dump. 3, 2 ...</td>
</tr>
<tr>
<td>03 18 40 08</td>
<td>CC</td>
<td>Okay. Spider this is Houston. We're not going to get it here. We'll see you over Antigua at about 03, and Spider, give us low bit rate if you read.</td>
</tr>
<tr>
<td>03 18 40 23</td>
<td>LMP (SPIDER)</td>
<td>Low bit rate.</td>
</tr>
<tr>
<td>03 18 40 25</td>
<td>CDR (SPIDER)</td>
<td>Yes. We should have DS1 VHF B on over Antigua.</td>
</tr>
<tr>
<td>03 18 40 31</td>
<td>CC</td>
<td>That's affirmative, Spider. And Gumdrop, this is Houston. If you still read me, we didn't give you a NAV check up, but we pulled a vector compare; it's real good. We're going to disregard it.</td>
</tr>
<tr>
<td>03 18 40 45</td>
<td>CMP (GUMDROP)</td>
<td>Gumdrop. Roger. Understand.</td>
</tr>
<tr>
<td>03 18 40 52</td>
<td>CC</td>
<td>Gumdrop, Houston. We'd recommend AC roll.</td>
</tr>
</tbody>
</table>

**ANTIGUA (REV 58)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 19 03 38</td>
<td>CC</td>
<td>Hello. Spider/Gumdrop, Houston through Antigua. Do you read?</td>
</tr>
<tr>
<td>03 19 03 45</td>
<td>CMP (GUMDROP)</td>
<td>Gumdrop, five-square.</td>
</tr>
<tr>
<td>03 19 03 48</td>
<td>CC</td>
<td>Roger, Gumdrop. Do I have Spider with me? And as soon as we get data here, we're going to have that E memory dump again, Spider.</td>
</tr>
<tr>
<td>03 19 03 58</td>
<td>CMP (GUMDROP)</td>
<td>Spider, Gumdrop. Houston's on the line, and they say as soon as they get data they're going to do the E memory dump again.</td>
</tr>
<tr>
<td>03 19 04 04</td>
<td>LMP (SPIDER)</td>
<td>Roger. We're ready.</td>
</tr>
</tbody>
</table>
Okay, Spider. Do you read Houston?

Roger, Houston. Read you now.

Okay. While we're waiting on that E memory dump, let me give you torqueing angles.

Roger. Ready to copy.

Roger. Torqueing angles: minus 00370, minus 00790, minus 00310.

Roger. Readback: minus 00370, minus 00790, minus 00310.

Roger. Copy. And we'd like to have high bit rate.

Roger. High bit rate.

Houston, did you ever find out anything about that A66 warning light yet?

Roger. We're working on that, and we'll probably have a procedure for you that might solve the problem - probably to turn it off and back on again, but we'll pass you the details later.

Okay.

... VERB 42.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(TAPE 59/1)

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ANTIGUA (REV 58)

03 19 05 31  CDR  Okay.
(SPIDER)

03 19 05 44  CMP  VERB 42.
(GUMDROP)

03 19 06 18  CDR  Houston, say again.
(SPIDER)

03 19 06 23  CC  Spider, this is Houston. We are getting CSM
data; we are getting no data from you. You
might check the switches, please.

03 19 06 34  CDR  Roger. Everything's checked out. We're in
(SPIDER)  telemetry HIGH.

03 19 06 40  CDR  And Houston, RD instrumentation B circuit breaker
(SPIDER)  coming in now.

03 19 06 43  CC  Okay. Thank you.

03 19 06 52  CC  Okay. We've got our data. Spider, we're ready
for E memory dump on your Mark.

03 19 06 57  CDR  Roger. 3, 2, 1.
(SPIDER)

03 19 07 00  CDR  MARK.
(SPIDER)

03 19 07 06  CDR  And, Houston, be advised that once again our
(SPIDER)  supercritical ...

03 19 07 14  CC  I'm sorry, Jim; I couldn't read that. Say again.

03 19 07 13  CDR  Roger. Super critical pressure gage does not
(SPIDER)  seem to be working for the descent propulsion
system.

03 19 07 26  CC  Roger. Copy.

03 19 07 34  CC  And, Spider, we're reading 734 on the SUPERCRT.

03 19 07 39  CDR  Okay.
(SPIDER)

03 19 07 54  TX  Okay. Spider, Houston. The dump is complete.
We're ready to uplink your state vector REFRESH.
<table>
<thead>
<tr>
<th>Time</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 19 08 01</td>
<td>LMF (SPIDER) Roger.</td>
</tr>
<tr>
<td>03 19 08 01</td>
<td>LMF (SPIDER) Okay. Go ahead.</td>
</tr>
<tr>
<td>03 19 08 06</td>
<td>CC Okay. It's on its way.</td>
</tr>
<tr>
<td>03 19 08 47</td>
<td>LMF (SPIDER) Houston, Spider. We're ready to copy the NAV check if you've got that.</td>
</tr>
<tr>
<td>03 19 08 50</td>
<td>CC Roger.</td>
</tr>
<tr>
<td>03 19 08 58</td>
<td>CC Reading the NAV check: 092 0000, minus 2799, plus 14631 1245.</td>
</tr>
<tr>
<td>03 19 09 30</td>
<td>CC Spider, Houston. Did you copy the NAV check?</td>
</tr>
<tr>
<td>03 19 09 41</td>
<td>CC Spider, this is Houston. Try me again.</td>
</tr>
<tr>
<td>03 19 09 47</td>
<td>LMF (SPIDER) Okay, Houston. Spider's back on with you now. I got the time and that's all.</td>
</tr>
<tr>
<td>03 19 09 53</td>
<td>CC Roger. Reading: you have the time, minus 2799, plus 14631 1245.</td>
</tr>
<tr>
<td>03 19 10 23</td>
<td>CC Gumdrop, do you read Houston?</td>
</tr>
<tr>
<td>03 19 10 32</td>
<td>CCF (GUMDROP) Spider, Gumdrop. Houston's breaking up on me, too.</td>
</tr>
<tr>
<td>03 19 10 34</td>
<td>LMF (SPIDER) Okay.</td>
</tr>
<tr>
<td>03 19 10 37</td>
<td>CC Okay, Spider. I've got you now. Try your readback.</td>
</tr>
<tr>
<td>03 19 10 41</td>
<td>LMF (SPIDER) Okay. I didn't get it; you're breaking up pretty badly, Houston. I get minus 027 and you broke up, so say again all after, please.</td>
</tr>
<tr>
<td>03 19 10 53</td>
<td>CC Okay. Starting with the time: 092 0000, minus 2799, plus 14631 1245.</td>
</tr>
<tr>
<td>03 19 11 15</td>
<td>LMF (SPIDER) Roger. 92 0000, minus 2799, plus 14631 1245.</td>
</tr>
<tr>
<td>03 19 11 26</td>
<td>CC That's affirmative, Spider. Houston confirms the update.</td>
</tr>
<tr>
<td>03 19 12 24</td>
<td>CC Okay. Spider/Gumdrop, I've probably got you solid now. How do you read me?</td>
</tr>
</tbody>
</table>
03 19 12 30  LMP (SPIDER) Better now, Houston. You're better.
03 19 12 34  CMP (GUMDROP) Almost five-hy.
03 19 12 35  CC Very good.
03 19 13 09  CC Okay. Spider, this is Houston. We've got the state vector in, we have VERB 66ed it, and we're going to hand over here within a few seconds, and then we'll put in the REFROMAT.
03 19 13 21  LMP (SPIDER) Okay. Roger.
03 19 14 04  CMP (GUMDROP) Spider, Gumdrop. I have a good transfer now.
03 19 14 08  LMP (SPIDER) Very good. In just a couple minutes we're going to find out if we have a good radar.
03 19 14 54  LMP (SPIDER) Okay, Houston. Let us know when you're ready for the gimbal drive and throttle.
03 19 15 00  CC Okay, Spider. The computer is yours. We are ready for your gimbal drive and throttle checks. Press ahead.
03 19 15 06  LMP (SPIDER) Roger. It works.
03 19 15 40  LMP (SPIDER) Okay. Houston, I'm going to start the drive now.
03 19 15 43  CC Roger. Go ahead, Spider; we're ready.
03 19 15 47  LMP (SPIDER) Roger. It's going.
03 19 15 54  LMP (SPIDER) Okay. Are you ready for the throttle check?
03 19 15 57  CC That's affirmative, Spider. Go ahead.
03 19 15 59  LMP (SPIDER) Roger. LMP throttle is MINIMUM, coming up to the soft stop; soft stop is 53 percent; STP is OFF; SCALE HIGH, DEARCPA light back down to the soft stop to idle.
(GOSS NET 1)

03 19 16 22 CC Roger, Spider. We copied. Go ahead.
03 19 16 25 LMP (SPIDER) Okay. Here comes the commander's throttle.
03 19 16 28 CC Okay. Press ahead, Jim; the LMP's throttle looked good.
03 19 16 33 LMP (SPIDER) We're up to soft stop, full throttle, back down to detent.
03 19 16 48 CC Roger. It looked good. Let's press, and this time both vehicles can bring up their S-band.
03 19 16 54 LMP (SPIDER) Roger.
03 19 17 42 CC Spider, this is Houston. You're GO on your gimbals and the throttle checks. We're standing by for the hot fire.
03 19 17 49 LMP (SPIDER) Roger. In work. Okay, Gumdrop. We're going to be doing our hot fire check here.
03 19 17 57 CMP (GUMDROP) Roger. Going to three.
03 19 17 59 LMP (SPIDER) Here comes the first ...
03 19 18 41 CC Roger. You're very weak but we're getting good data. Press ahead, Spider.
03 19 18 58 LMP (SPIDER) Okay, complete.
03 19 19 11 LMP (SPIDER) Okay, we're going to do the hard over check now.
03 19 19 15 CC Okay, Spider. We're getting data.
03 19 19 30 LMP (SPIDER) Complete.

MADRID (REV 58)

03 19 19 44 CC Okay, Gumdrop. If - Can you read me?
03 19 19 49 LMP (SPIDER) Here we go with the other hot mode.
03 19 19 51  CMP (GUMDROP)  Roger.
03 19 19 52  CC  Okay. Spider's very weak. His data is good, however. Let me - And I'd like to remind you that B-3 is still ENABLED.
03 19 20 01  CMP (GUMDROP)  Roger.
03 19 20 04  CMP (GUMDROP)  Spider, Gumi.rop. They say you're still good.
03 19 20 08  LMP (SPIDER)  Roger. We read them, and we're going to start the PGRCS checks here in just a minute. We just did the AGS translation control check.
03 19 20 16  CC  Roger. Now you're loud and clear, Spider. We're working through Madrid now.
03 19 20 22  LMP (SPIDER)  Okay. Here comes the PGRCS and TTCA's.
03 19 20 26  CC  Okay.
03 19 20 40  LMP (SPIDER)  It's complete.
03 19 20 46  CC  Roger, Spider.
03 19 21 16  LMP (SPIDER)  Houston, how do you read Spider?
03 19 21 18  CC  You're loud and clear, Spider.
03 19 21 19  LMP (SPIDER)  Okay.
03 19 21 20  LMP (SPIDER)  What's the trouble with COMM here?
03 19 21 22  CC  I don't know. You got real weak on me, but good data across on you there.
03 19 21 30  CC  And then it came in good when we handed off to Madrid.
03 19 21 43  CC  Okay. And we're probably going to lose Madrid shortly, and we'll see you over Carnarvon at 51. The first look at your checks look real good, Spider.
Okay, Houston. Say again the time.

Roger. We'll see you at Carnarvon about 51.

Roger. Carnarvon 51, and Spider, he said your tests look real good.

And Spider, give me low bit rate.

Okay. Low bit rate.

And we just about used it up that time, troops.

Yes, I sure would appreciate it if we had better COMM.

So would I.

Carnarvon, this is Houston. Did you get a C and W right at the end there?

Negative.

Okay. Thank you.

Should I have?

No. No; the H2 heater cycle D and we are curious whether you got it or not.

Okay.

Carnarvon (REV 58)

... time ... breakdown.

Okay.

CAL is complete there, chiefs.

Okay.
03 19 49 38 CC  Spider/Gumdrop, Houston through Carnarvon. Standing by.

03 19 49 41 CMP  (GUMDROP)  Okay. You're on the air all the time.

03 19 49 44 LMP  (SPIDER)  Yes; I notice that now. Thank you.

03 19 49 45 LMP  (SPIDER)  I think I use my VOX, and I forget to switch once and a while, so if it sounds like we're chatting here, let us know during the rendezvous.

03 19 49 52 CMP  (GUMDROP)  Alrighty.

03 19 49 55 LMP  (SPIDER)  We're close enough now; we don't need a mike.

03 19 50 00 CC  Gumdrop/Spider, this is Houston through Carnarvon. Standing by.

03 19 50 06 CDR  (SPIDER)  Roger, Houston. This is Spider, here. We just finished our landing radar test. We got the rendezvous radar test one time and it looks pretty good. We could do it again for you if you like. We're getting the AGS CAL data for you right now.

03 19 50 18 CC  Roger. Understand. And we'd like to have high bit rate, and leave it on from now on.

03 19 50 24 CDR  (SPIDER)  Okay. High bit rate from now on.

03 19 50 29 LMP  (SPIDER)  How about that R and D B. You want that on from now on?

03 19 59 33 CC  That's affirmative, Spider.

03 19 59 36 CDR  (SPIDER)  Okay?

03 19 59 38 LMP  (SPIDER)  Okay, Houston. If you don't have any higher priority here, I got the AGS CAL data.

03 19 59 44 CC  That's number 1 on our list, Spider. Go.

03 19 59 47 LMP  (SPIDER)  Okay. Before the CAL, the bias were, respectively, 00 and minus all 7's.
03 19 50 58 CC All right. Copy.
03 19 51 00 LMP (SPIDER) The drift coefficient for plus 407, plus 30, is 28 and plus all zeros.
03 19 51 11 CC Okay. Copy.
03 19 51 13 LMP (SPIDER) The CAL: The bias coefficients were plus 0, plus 0's, plus 0's, minus all 7's.
03 19 51 21 CC Copy.
03 19 51 24 LMP (SPIDER) The coefficient for plus 0019, plus 0013, and 00001.
03 19 51 37 CC Roger. I copy those, Spider. Thank you very much.
03 19 51 42 LMP (SPIDER) Okay. And I've got a question for you.
03 19 51 44 CC Go ahead.
03 19 51 45 LMP (SPIDER) Here we notice in updating the AGS that the computer activity light was on for a very long while. I wonder if maybe you updated our state vector more than a rev ahead, and then by doing a VERB 47 we intergrated it backward too far. I wonder if you could have someone look at that.
03 19 52 09 LMP (SPIDER) Did you get that one?
03 19 52 10 CC We copy, Spider. Stand by.
03 19 52 13 LMP (SPIDER) Okay. It's just a question of whether VERB 47 hurts us, when we do that.
03 19 52 18 CC Roger. We can verify our state vector was not - was not more than a rev ahead, and we'll - We copied your question on the VERB 47.
03 19 52 28 LMP (SPIDER) Okay. As long as it was not more than a rev ahead when you updated us, there should be no sweat.
03 19 52 34 CC Roger. Copy.
03 19 52 38 CMP (GUNDROP) Houston, Gumdrop.
03 19 52 40  CC  Go, Gumdrop.

03 19 52 42  CMP (GUMDROP)  My fuel cell 2 condenser exhaust temperature is a tad high. What's it look like to you?

03 19 52 47  CC  Roger, Gumdrop. We've been checking that. It is running a little high. We think it's going to hold okay through the rendezvous.

03 19 52 56  CMP (GUMDROP)  Okay; fine. It hasn't changed much during the last 30 minutes. I just thought I'd make sure of it.

03 19 53 01  CC  Roger. It's been cycling with the night/day cycle. We even think it's slave to the radiator.

03 19 53 09  CMP (GUMDROP)  Okay.

03 19 53 11  LMP (SPIDER)  Houston, this is Spider. Do you want either the landing radar or the rendezvous radar self-test performed again over the site?

03 19 53 18  CC  That's a negative, Spider.

03 19 53 21  LMP (SPIDER)  Okay. Great.

03 19 53 22  CDR (SPIDER)  Gumdrop, you're clear to turn your transponder on then.

03 19 53 25  CMP (GUMDROP)  Roger. And I also expect DUPLEX A, and we'll see ... 

03 19 53 29  LMP (SPIDER)  Okay. Fine.

03 19 53 36  LMP (SPIDER)  We'll configure the same way; we will be - receive A and B and transmit A.

03 19 53 40  CMP (GUMDROP)  Okay. And the transponder power is ON.

03 19 53 43  LMP (SPIDER)  Okay. Gumdrop, are you ready to support a lighting check?

03 19 53 49  CMP (GUMDROP)  Ready to support.

03 19 53 51  CDR (SPIDER)  Okay. We're going to turn our tracking light on now; see if you can see it.
03 19 54 02 CDR (SPIDER) I don't see anything flashing, do you?
03 19 54 04 CMP (GUMDROP) ... look down at the porch, Jim.
03 19 54 12 CMP (GUMDROP) I don't see anything.
03 19 54 20 CDR (SPIDER) I don't see anything either.
03 19 54 21 IMP (SPIDER) I don't see it either, Dave. Just a minute.
03 19 54 40 CDR (SPIDER) Houston, are you with us yet?
03 19 54 45 IMP (SPIDER) Houston, Spider. Do you read?
03 19 54 49 CMP (GUMDROP) Houston, Gumdrop.
03 19 54 50 CC Houston here. Go ahead.
03 19 54 54 IMP (SPIDER) Okay. It didn't look like our tracking light was on. I think I might see it right now, though. Yes, Dave, I think I see it flashing.
03 19 55 01 CC Roger. Copy. And we'd like to have your S-band volumes up at about 57. We'll be in Honeysuckle in about a couple of minutes.
03 19 55 10 IMP (GUMDROP) Okay.
03 19 55 11 CDR (SPIDER) Okay. I see a reflection on one of the quads out here, so I think it is flashing.
03 19 55 16 CMP (GUMDROP) Yes, I've got it now, down by the porch now.
03 19 55 20 IMP (SPIDER) Boy, it's sure not very bright, is it?
03 19 55 23 CDR (SPIDER) No, it doesn't seem to be.
03 19 55 28 IMP (SPIDER) Okay. Going to a docking light.
03 19 55 39  CMP (GUMDROP)  Okay. I've got one of them on the right.
03 19 55 43  ILM (SPIDER)  Okay. That's good enough. We'll leave the docking lights on for you.
03 19 55 46  CMP (GUMDROP)  Okay.
03 19 55 49  ILM (SPIDER)  Okay. Why don't you give me your lights?
03 19 55 52  CMP (GUMDROP)  All right. Here comes my monitor lights.
03 19 56 02  CDR (SPIDER)  I don't see anything.

HONEYSUCKLE (REV 58)

03 19 58 18  CC  Okay. Spider/Gumdrop, Houston through Honeysuckle. How do you read?
03 19 58 33  CMP (GUMDROP)  What did you say?
03 19 58 36  ILM (SPIDER)  I said give me bright.
03 19 58 39  CMP (GUMDROP)  All right. There's not much difference between them.
03 19 58 41  ILM (SPIDER)  Boy, that thing is really off, Dave. When we come back and try to dock, you are really going to have to keep an eye on me. As a matter of fact ... had shifted a little bit from when I looked over it yesterday, I think.
03 19 58 52  CMP (GUMDROP)  Not too much.
03 19 58 58  ILM (SPIDER)  All right. It's pretty stationary there. It's just that the ... isn't pointed in the right direction. Looks like I'm getting dangerous. I'll just attitude hold and you can do it.
03 19 59 06  CMP (GUMDROP)  Okay.
(GOSS NET 1)  

03 19 59 08  CC  Spider/Gumdrop, Houston through Honeysuckle. I have your phasing PAD when you are ready to copy.
03 19 59 18  CMP (GUMDROP)  Roger, Houston. Stand by. I'll get out the phasing PAD.
03 19 59 23  CC  Standing by.
03 19 59 30  CDR (SPIDER)  Hey, Dave, did your spotlight ever work at all?
03 19 59 36  CMP (GUMDROP)  No, it hasn't.
03 19 59 38  CDR (SPIDER)  Hey, tell Dave that we're ready to do a phasing PAD.
03 19 59 42  CDR (SPIDER)  Dave, how about the phasing PAD? Are you ready to copy?
03 19 59 46  CDR (SPIDER)  I can't hear him now ...  
03 19 59 47  LMP (SPIDER)  S-band, S-band.
03 19 59 48  CMP (GUMDROP)  We're on S-band.
03 19 59 55  CC  Gumdrop, Houston. How do you read?
03 19 59 58  CDR (SPIDER)  Even though I have my volume up on it, I can't read ...  
03 20 00 00  LMP (SPIDER)  Spider's ready.
03 20 00 05  CC  Roger. Spider/Gumdrop; reading phasing PAD: 093 47 34 00, plus 00 009 all zips, minus 00 907 00 907 000 286, plus 00020 all zips, minus 00907. Your SEP time: 093 02 5300; TPI 0: 094575300. End of update.
03 20 01 32  LMP (SPIDER)  Roger. On the readback we've got 093 47 34 00, plus 000 09, all zips, minus 00 907 00 907, all zips 286, plus 00020, all zips, minus 00907; TPI: 0945753.
03 20 02 07  CC  Okay, Rusty. Read me your SEP time again. We dropped it there.
Roger. SEP: 93:02:53.

That's right. Houston confirms the PAD. It looks good.

And Gumdrop copies.

Hey, did you agree with the SEP time, Dave?

I agree with the ...

Okay.

Are you transmitting B?

Negative.

Okay. We've got a change in our COMM since we reconfigured here. I was just trying to figure out why.

Okay. I'm transmitting ... on.

Gone, nothing.

And, we're about a minute off Honeysuckle, here, so we'll see you over the Mercury about 10.

Gumdrop. Copy.

This is Spider. Roger.

Spider and Gumdrop, Houston through Mercury.

Houston, Spider. How do you read?

Read you loud and clear, Spider. This is Houston.

You are GO for unlocking, you are GO for 78 dash ".
your AGS is GO. You can just unscrew the bulb if that light bothers you. And would like to inform you that during the phasing burn and probably also during breaking, you can anticipate a heater CAUTION light coming on. This will be from the RCS and this is after looking at the data that we've got here. There'll be no sweat.

03 20 10 50  LMP  Okay. Thank you.
(GOSS NET 1)  (SPIDER)

03 20 11 22  CMP  Houston, Gumdrop.
(GUMDROP)

03 20 11 36  CMP  Spider, Gumdrop.
(GUMDROP)

03 20 11 38  LMP  Go ahead, Gumdrop. Spider.
(SPIDER)

03 20 11 39  CMP  I'll give you a Mark at 51:10. Okay?
(GUMDROP)

03 20 11 42  LMP  Okay.
(SPIDER)

03 20 11 44  CMP  One.
(GUMDROP)

03 20 11 45  CMP  MARK.
(GUMDROP)

03 20 11 47  LMP  Okay. We're off by about a second.
(SPIDER)

03 20 11 50  CMP  Okay.
(GUMDROP)

03 20 11 55  CDR  Hey, you sure sound funny all of a sudden; say something again.
(SPIDER)

03 20 11 59  CMP  Okay. Something again. I just switch to the other --
(GUMDROP)

03 20 12 03  LMP  All right; you sounded garbled.
(SPIDER)

03 20 12 26  CMP  Spider, Gumdrop ...
(GUMDROP)

03 20 12 38  LMP  Houston, Spider. Do you read?
(SPIDER)
03 20 12 42 CC Spider, this is Houston. I'm reading you loud and clear.

03 20 12 45 LMP (SPIDER) Roger. Gumdrop's trying to call you.

03 20 12 48 CC Gumdrop, this is Houston. How do you read?

03 20 12 53 CPM (GUMDROP) I'm ...

03 20 12 54 CC You're breaking up slightly and way down, Gumdrop.

03 20 13 00 CPM (GUMDROP) Roger. That fuel cell 2 ... and I've got a fuel cell 2 light. Just thought I'd let you know.

03 20 13 11 CC Roger. Understand. Fuel cell 2 light and that's from the TCE?

03 20 13 14 CPM (GUMDROP) That's affirmative.

03 20 13 17 CC Okay. And you're loud and clear now, Gumdrop.

03 20 13 22 CPM (GUMDROP) Okay.

03 20 13 26 LMP (SPIDER) You're still a little garbled to me, Gumdrop. Whatever you did in the last few minutes, it sure changed the character of your radio.

03 20 13 31 CPM (GUMDROP) Let me go back the other way.

03 20 13 34 CDR (SPIDER) Gumdrop, it wasn't that; it was when you switched to the rendezvous configuration, I believe.

03 20 13 40 LMP (GUMDROP) Roger. Let me try it the other way.

03 20 13 45 CPM (GUMDROP) How is it now?

03 20 13 48 CDR (SPIDER) It's about the same.

03 20 13 51 CPM (GUMDROP) Okay.

03 20 13 53 CDR (SPIDER) Now it changed.
GUMDROP! I'm losing you here. We'll see you over the sunny Grand Bahama's at about 36.

BAHAMAS (REV 59)

03 20 35 40  CC  Spider/Gumdrop, Houston. How do you read?
03 20 35 47  CMP (GUMDROP)  Reading you five-by Houston.
03 20 35 50  CC  Roger, Gumdrop. If you've got time now, we'd like for you go ACCEPT so during this busy period we can ship you a state vector. We'll not give you a NAV check; we'll do a vector compare.
03 20 36 00  CMP (GUMDROP)  Roger. Going to ACCEPT now.
03 20 36 02  CC  Roger. Thank you.
03 20 36 12  IMP (SPIDER)  Houston, this is Spider. We're reading you also, now.
03 20 36 15  CC  Very good; you're loud and clear. Standing by for your undocking.
03 20 36 18  IMP (SPIDER)  Roger.
03 20 36 55  CMP (GUMDROP) One minute.
03 20 36 57  LMP (SPIDER) Roger. We're ready.
03 20 37 25  CMP (GUMDROP) Ready.
03 20 37 26  LMP (SPIDER) Roger.
03 20 37 45  CMP (GUMDROP) 10.
03 20 37 52  CMP (GUMDROP) 3, 2, 1.
03 20 37 54  CMP (GUMDROP) UNDOCK.
03 20 37 59  LMP (SPIDER) Uh-oh. We didn't release.
03 20 38 00  CMP (GUMDROP) Hang on something.
03 20 38 08  CMP (GUMDROP) We have a short pull backwards.
03 20 38 10  LMP (SPIDER) Say again.
03 20 38 12  CMP (GUMDROP) I said would you hang on something. I'm going
to pull you back a little bit.
03 20 38 14  LMP (SPIDER) Okay.
03 20 38 24  CMP (GUMDROP) Okay. We're nice and stable with respect to you.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

ANTIGUA (REV 59)

03 20 39 01 CMP (GUMDROP) Okay. We seem to be hanging; it seems like the probe's out; the capture latches haven't released.

03 20 39 05 LMP (SPIDER) Yes. That's what it looks like.

03 20 39 09 LMP (SPIDER) We're pretty stable here. Wonder what's wrong with it?

03 20 39 15 CMP (GUMDROP) Houston, got any suggestions?

03 20 39 17 CC We're copying all that, Gumdrop and Spider. Stand by.

03 20 39 36 CMP (GUMDROP) Okay. You're free.

03 20 39 38 LMP (SPIDER) I'm free?

03 20 39 39 CMP (GUMDROP) Roger.

03 20 39 40 LMP (SPIDER) What did you do?

03 20 39 41 CMP (GUMDROP) Oh, went back to the old memory and put a cycle on the switch, and you look like you're free.

03 20 39 46 LMP (SPIDER) Okay. Great.

03 20 39 51 CDR (SPIDER) Okay. We're going to start you around now.

03 20 39 54 CMP (GUMDROP) Hold off.

03 20 39 56 LMP (SPIDER) What?

03 20 39 57 CMP (GUMDROP) Wait a minute.

03 20 39 59 LMP (SPIDER) I can't hear you.
Hold. Wait a minute till I get clear.

Okay.

Now you're clear.

Okay.

Okay. Our attitudes are a little screwed up now, Dave, so we may have a little problem with that.

Roger. I noticed.

Okay. I'm stationkeeping on you now, so no sweat.

Okay.

Spider, I'm going to stay in plane and just follow you with the pitch.

Okay. Fine. How am I drifting away from you?

Elliptic; out of plane. To your rear.

Okay. Well, I can't notice that. My R&G's look good, except my yaw rate is going around about 1 degree per second.

Are you yawing now?

That's right. I'm yawing right now. I'm doing my 120-degree yaw. When I get over here, Dave, why don't I just stop the yaw and roll - my roll so that I'm up, rightside up, on the bellyband. Then it'll get back to maybe about the right attitude, at least in plane.

Good idea.

Okay, Dave. I'm going to roll up in plane now.
Okay, Dave. I'm going to come rightside up here now, and when I get hit there, then I'll just stop and you can position yourself.

Okay.

We won't do the 180-degree pitch, Dave; we'll just do the 90-degree pitch up here.

Okay. Good idea.

I think it would be all right if we just get some relative attitudes, because I'm going to maneuver to the proper attitude for the SEP, and you can line up on me there.

Right. Okay. Okay. I'm going to do the pitch-around maneuver, and I'm going to pitch 90 degrees only.

Okay. Fine.

Okay. I'm going to start now.

You're clear.

Looking good.

Okay.

That's a nice looking machine.

So is yours.

That's about all it looks like, though, is some sort of machine.

Okay, Dave. When I get about perpendicular to you, I'm going to stop and start my yaw to the left.
(GOSS NET 1)  

03 20 46 22 CMP (GUMDROP) Okay.

03 20 46 31 CDR (SPIDER) Okay. I'm going to start my yaw right now.

03 20 46 32 CMP (GUMDROP) Okay. Keep --

03 20 46 35 CMP (GUMDROP) Go ahead.

03 20 47 16 CMP (GUMDROP) I think we're in good shape, attitude-wise.

03 20 47 18 CDR (SPIDER) Yes. We only got off about 20 or 30 degrees, there, Dave.

03 20 47 22 CMP (GUMDROP) Yes.

03 20 48 07 CMP (GUMDROP) All the downlocks look good so far.

03 20 48 10 CDR (SPIDER) That's very good.

03 20 48 50 CC Spider and Gumdorp, Houston. Sometime within the next 4 minutes let's get -- Be sure your S-band volume is up. We'll be going over to Madrid.

03 20 48 57 LMP (SPIDPR) Roger. Spider.

03 20 48 58 CMP (GUMDROP) Gumdorp.

03 20 49 51 CMP (GUMDROP) Okay. I've got 13 minutes before the SEP burn.

03 20 49 56 CDR (SPIDER) Would you believe it, but I think my COAS went out. Oh, there ...

03 20 50 01 SC ... Okay.

03 20 50 04 CMP (GUMDROP) Is it okay?

03 20 50 42 CP (GUMDROP) I'm getting a look at your engine down here, and it looks pretty clean.
03 20 50 46  CDR  (SPIDER)  Good.
03 20 50 49  CDR  (SPIDER)  I can't see much except your nose, so - Right now, I can't even see that.
03 20 52 18  CMP  (GUMDROP)  I can see your skip rudder when I back off just a bit.
03 20 52 21  CDR  (SPIDER)  Roger.
03 20 52 42  CDR  (SPIDER)  Okay, Dave. We can take over the station-keeping here.
03 20 52 48  CMP  (GUMDROP)  Okay.
03 20 52 51  CMP  (GUMDROP)  I've got a slight up movement on you.
03 20 52 54  CDR  (SPIDER)  Okay.
03 20 52 56  CMP  (GUMDROP)  You've got the stationkeeping.
03 20 52 57  CDR  (SPIDER)  I have the stationkeeping.
03 20 53 00  CMP  (GUMDROP)  Did you say your COAS was out?
03 20 53 01  CDR  (SPIDER)  It's working; it's so dim I just can't see it.
03 20 53 06  CMP  (GUMDROP)  I got the same.

MADRID (REV 59)

03 20 56 32  CC  Okay, Spider/Gumdrop. We're going to lose you here within a minute at Madrid. We'll see you over Carnarvon around 23.
03 20 56 44  CMP  (GUMDROP)  Roger. Gumdrop copy. Carnarvon at 23.
03 20 56 48  CC  That's affirmative.
Hey, Spider. On ... plane ...

And, Gumdrop, your vector is good. We've looked at it; the computer is yours, of course, and you can go BLOCK any time.

Gumdrop/Spider, Houston through Carnarvon. Standing by.

Gumdrop. Roger.

Roger, Gumdrop. Confirm the SEP burn.

Roger. SEP burn on time. Good burn, and everything's looking good.

Thank you.

... We finished marking Sirius, and we're on the fourth set on Atria.

Roger, Spider. You are loud and clear.

Would you believe five zeros?

Beautiful.

Roger, Spider.

That looks mighty pretty, Spider.

Thank you.

Spider, Gumdrop. I can see your jets firing just as clear as a bell.

Roger. I was watching your light down there.

You just gave a big burst, didn't you?

Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>Node</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 21 26 44</td>
<td>CMP (GUMDROP)</td>
<td>It just lights up the whole sky.</td>
</tr>
<tr>
<td>03 21 26 53</td>
<td>CC</td>
<td>Gumdrop, Houston. Did you do a P52 there?</td>
</tr>
<tr>
<td>03 21 26 57</td>
<td>CMP (GUMDROP)</td>
<td>Roger. And stand by, and I'll give you the angles.</td>
</tr>
<tr>
<td>03 21 26 59</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 21 27 05</td>
<td>CMP (GUMDROP)</td>
<td>It will be about 5 minutes.</td>
</tr>
<tr>
<td>03 21 29 26</td>
<td>CC</td>
<td>Okay. Spider and Gumdrop, this is Houston. And I'll lose you at Carnarvon in about a minute; and bring up your S-band volumes about that time. We'll have you at Honeysuckle.</td>
</tr>
<tr>
<td>03 21 29 37</td>
<td>CDR (SPIDER)</td>
<td>Okay.</td>
</tr>
<tr>
<td>03 21 29 40</td>
<td>CMP (GUMDROP)</td>
<td>Gumdrop.</td>
</tr>
<tr>
<td>03 21 31 47</td>
<td>CDR (SPIDER)</td>
<td>Are you firing a lot up there?</td>
</tr>
<tr>
<td>03 21 31 49</td>
<td>CMP (GUMDROP)</td>
<td>Yes. I'm just - Yes. Roger.</td>
</tr>
<tr>
<td>03 21 31 53</td>
<td>CDR (SPIDER)</td>
<td>That's going to put your light out. I can't even see it.</td>
</tr>
<tr>
<td>03 21 31 56</td>
<td>CMP (GUMDROP)</td>
<td>Just pulsing.</td>
</tr>
</tbody>
</table>

**Honeysuckle (Rev 59)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Node</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 21 32 10</td>
<td>CC</td>
<td>Okay. Spider/Gumdrop, Houston. We've got you through Honeysuckle now.</td>
</tr>
<tr>
<td>03 21 32 20</td>
<td>CMP (GUMDROP)</td>
<td>Gumdrop monitors. Spider, do you have your light on?</td>
</tr>
<tr>
<td>03 21 32 26</td>
<td>LMP (SPIDER)</td>
<td>On the cab.</td>
</tr>
<tr>
<td>03 21 32 32</td>
<td>CC</td>
<td>And, Spider, when you've got a moment, I want to pass on a little bit of info.</td>
</tr>
</tbody>
</table>
03213239 LMP (SPIDER) Say you want to pass, Houston?

03213241 CC Roger. I want to update your red lines on the DPS: your oxidizer to fuel red line is 25 - 25 versus the 12 as shown on your checklist.

03213300 LMP (SPIDER) Roger. Understand 25 percent on the red line for oxidizer.

03213305 CC No. It's a DELTA-P of 25 psi oxidizer to fuel.

03213313 LMP (SPIDER) Okay. 25 DELTA-P oxidizer to fuel.

03213317 CC Roger. On the DPS.

03213318 LMP (SPIDER) ... the line.

03213319 CC That's affirmative.

03213323 CC In other words, they are both 25 now.

03213329 CDR (SPIDER) Roger. Got you.

03213333 CMP (GUMDROP) Houston, Gumdrops. I can give you those angles now.

03213335 CC Go ahead.

03213337 CMP (GUMDROP) Roger. GET at 93 14 00, plus 00117, plus 00035, minus 00109.

03213353 CC Roger. Copy. Thank you, Gumdrops.

03213356 CMP (GUMDROP) Roger.

03213431 CC Spider and Gumdrops, this is Houston. You are GO for phasing.

03213435 CDR (SPIDER) Roger, Houston. Understand we are GO for phasing.

03213437 CMP (GUMDROP) Gumdrops.

03213447 CC And, Gumdrops, you might anticipate a MASTER ALARM on your H₂ tank pressure.
(GOSS NET 1)

03 21 34 52  CMP (GUMDROP)  Roger.
03 21 35 46  CMP (GUMDROP)  Spider, Gumdrop.
03 21 35 47  LMP (SPIDER)  Go ahead.
03 21 35 48  CMP (GUMDROP)  May I have this cross in link?
03 21 35 53  LMP (SPIDER)  Okay.
03 21 36 00  CDR (SPIDER)  When your thrusters fire, it just puts out a great big orange cloud I can see way back here.
03 21 36 04  CMP (GUMDROP)  Yes. Yours too.
03 21 36 26  LMP (SPIDER)  Boy, I sure could use those 1 degree-per-second rate needles, or at least some rate needles that were accurate.
03 21 36 53  CC  Spider and Gumdrop. We are going to lose you at Honeyuckle in - within a minute, and we'll see you over the Mercury at 43.
03 21 37 01  CDR (SPIDER)  Roger.
03 21 37 05  CDR (SPIDER)  Gumdrop, cut your lights down.

MERCURY (REV 59)

03 21 43 23  CC  Spider and Gumdrop, this is Houston through the Mercury. Standing by for your burn.
03 21 43 29  CMP (GUMDROP)  Roger. Stand by.
03 21 43 33  CC  And I'm reading you.
03 21 43 39  LMP (SPIDER)  Roger, Houston. This is Spider. How do you read?
03 21 43 41  CC  I'm reading you loud and clear, Spider.
03 21 43 48  LMP  Roger. I'm right with you on horizontal crossing.
   (SPIDER)

03 21 43 53  CMP  Okay.
   (GUMDROP)

03 21 45 29  CDR  It will be 2 minutes on my Mark, Gumdrop.
   (SPIDER)

03 21 45 36  CDR  MARK.
   (SPIDER)

03 21 45 37  CMP  Right with you.
   (GUMDROP)

03 21 47 00  CDR  35 seconds, Gumdrop.
   (SPIDER)

03 21 47 03  CMP  Roger.
   (GUMDROP)

03 21 47 26  CDR  10 seconds.
   (SPIDER)

03 21 48 13  CDR  It was a good burn, Gumdrop.
   (SPIDER)

03 21 48 15  CMP  Okay. Good.
   (GUMDROP)

03 21 48 18  CDR  It got a little rough there when we throttled up.
   (SPIDER)

03 21 48 21  CMP  Well, you didn't have the Gumdrop with you.
   (GUMDROP)

03 21 48 55  LMP  Houston, the CAL coming on?
   (SPIDER)

03 21 48 59  LMP  Houston, Spider.
   (SPIDER)

03 21 49 03  CC  Go, Spider. Houston.

03 21 49 05  LMP  Roger. The burn was a good one, and we are giving you CAL.
   (SPIDER)

03 21 49 08  CC  Roger. Thank you.

03 21 49 11  CDR  At 500, 501, and 502, after trimming the FGCS, we are reading 00 and minus 1.
   (SPIDER)
03 21 49 18  CC  Roger. Good work.
03 21 49 25  IMP (SPIDER)  ... Yes, I did. Landing radar open.
03 21 49 26  CMP (GUMDROP)  Okay.
03 21 49 44  IMP (SPIDER)  Okay. Engine gimbal to ENABLE.
03 21 49 47  CMP (GUMDROP)  ... to ENABLE. Stand by.
03 21 49 52  CC  Everything looks good here, Spider. It was a good burn.
03 21 49 55  IMP (SPIDER)  Okay. It was a little rough. It got a little rough and chuggy around 20 percent as I was throttling up. I waited for it and then throttled up --
03 21 50 03  CDR (SPIDER)  ... throttle 1 OPEN.
03 21 50 04  CMP (GUMDROP)  ... 1 OPEN.
03 21 50 07  CC  Roger. We're losing you at the Mercury, and we will see you over Texas about 05.
03 21 50 13  IMP (SPIDER)  Okay. And you can debrief the burn.
03 21 50 14  CMP (GUMDROP)  Okay. Got it?
03 21 50 15  CDR (SPIDER)  Yes.
03 21 50 16  CMP (GUMDROP)  Okay.
03 21 50 43  CDR (SPIDER)  ... to pitch now on the ... I'm going to ...

TExAS (REV 60)

03 22 05 03  CC  Gumdrop, Houston through Texas. Standing by.
03 22 05 54  CC  Spider/Gumdrop, Houston through Texas. Standing by.
03 22 05 57  LMP (SPIDER)  Hello, there, Houston through Texas standing by. How are you?
03 22 06 01  CC  Oh, we're doing fine. Looks like you are doing great up there, also.
03 22 06 04  LMP (SPIDER)  Okay. Where are we over the ground?
03 22 06 07  CC  Oh, you're just coming into Central America down here.
03 22 06 12  LMP (SPIDER)  Okay.
03 22 06 23  LMP (SPIDER)  I'll tell you one thing, this is really an ungainly beast with that big descent stage on it. With the - when you try to thrust laterally.
03 22 06 31  CC  Roger. Copy.
03 22 06 40  CC  Gumdrop, Houston. Like to verify H₂ tank 1 heater is AUTO.
03 22 06 46  CMP (GUMDROP)  That is verified. H₂ tank 1 heater is AUTO, and I have the cryo light on.
03 22 06 51  CC  Understand.
03 22 06 54  CMP (GUMDROP)  But the fuel cell light is off.
03 22 07 09  CC  Gumdrop, Houston. We'd like to have H₂ tank 2 heater to AUTO.
03 22 07 15  CMP (GUMDROP)  H₂ tank 2 heater AUTO, now.
03 22 07 19  CC  Understand.
03 22 07 37  CDR (SPIDER)  Hey, Gumdrop. We'll be having our first solution here in a few seconds.
03 22 07 45  CMP (GUMDROP)  Okay. I've already got mine, and I've got an elevation of 211.49.
03 22 08 25  LMP (SPIDER)  Hey, Dave. We're plotting our relative position to you, and, man, we're right on the nominal.
03 22 08 30  CMP (GUMDROP)  Hey, that's great!
03 22 08 42  LMP  We got it at 26 miles right now, if you are interested.
(SPIDER)

03 22 08 53  LMP  And we got 30.59 for our first elevation angle solution.
(SPIDER)

03 22 09 05  CDR  What did you get for yours, Dave?
(SPIDER)

03 22 09 06  CMP  Well, in your language it would be 31.49.
(GUMDROP)

03 22 09 10  LMP  Oh, I didn't hear - I heard - I thought you said 211\frac{1}{4} - -
(SPIDER)

03 22 09 13  CMP  Wait a minute, 21\frac{1}{4}.
(GUMDROP)

03 22 09 15  LMP  Okay. Fine.
(SPIDER)

03 22 09 16  CMP  Right now, I have you at 26.27 and 150.4.
(GUMDROP)

03 22 09 20  LMP  Okay. I've got 26.27, and I'm at 155.5. That's on my radar. It's probably 5 feet off. Matter of fact, it didn't agree with the tape's record by a couple of feet per second.
(SPIDER)

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(TCOS 6/ET 1)

TEXAS (REV 60)

03 22 13 42  CC  Gumdrop, Houston.
03 22 13 44  GUM  This is Gumdrop. Go.
03 22 13 47  CC  Roger. We noticed you've gone to a four-jet roll authority. Unless you've got a good reason, we are recommending Baker Dog roll OFF.
03 22 13 57  GUM  Roger. I'm running the DAP.
03 22 14 04  GUM  And you can check the DAP. I'm using ... DAP.
03 22 14 11  CC  Roger, Gumdrop. Copy
03 22 14 19  GUM  There's the ED roll OFF.
03 22 14 22  CC  Copy.
03 22 15 34  CC  Spider, Houston.
03 22 15 35  CDR  (SPIDER)  Go ahead, Houston. Spider.
03 22 15 37  CC  Roger. We would like to have the DVI OFF at this time, and we would like to have you verify the CO2 sensor circuit breaker on panel 16 is IN.
03 22 15 48  SPIDER  Stand by.
03 22 15 50  CDR  (SPIDER)  Roger. It's closed.
03 22 15 51  CC  Roger. Under...it's closed. And if you've got a minute, I want to give you an update on some bias times.
03 22 16 24  CDR  (SPIDER)  Okay. Houston, Spider. Be with you in just a second.
03 22 16 28  CC  Roger. No sweat.
03 22 16 49  GUM  Do you want to watch your radar now? Is it staying the same.
03 22 16 54  COR (SPIDER)  Go.
03 22 17 06  CMP (GUMDROP)  No, I didn't need it.
03 22 17 21  LMP (SPIDER)  Okay. Go ahead, Houston.
03 22 17 23  CC  Roger. This is an update in your P32 program. The TPI bias has changed from 3 minutes to 4 minutes. We want you to add 4 minutes on the TPI bias in your CSI P32 program.
03 22 17 48  LMP (SPIDER)  Roger. The CDH bias still 1 plus 4.5.
03 22 17 51  CC  That is affirmative. The CDH bias is 1 plus 4.5. We are only changing the TPI bias.
03 22 17 59  LMP (SPIDER)  Roger.
03 22 18 18  LMP (SPIDER)  Gumdrop, did you get that?
03 22 18 22  CMP (GUMDROP)  Roger. I copied.
03 22 18 23  LMP (SPIDER)  Good time for procedure changes, isn't it?
03 22 18 26  CMP (GUMDROP)  Roger.
03 22 18 27  CC  Spider? Spider, Houston.
03 22 18 32  LMP (SPIDER)  Go ahead.
03 22 18 34  CC  Roger. I - As you've probably figured out, this is due to the change in the orbit. We've got a little more eccentricity than we planned on.
03 22 18 43  CC  And we are showing your orbit as 122 by 127.
03 22 18 47  LMP (SPIDER)  Okay.
03 22 20 23  CC  Spider/Gumdrop, Houston. I have a TPI, PAD.
03 22 20 29  LMP (SPIDER)  Spider ready.
03 22 20 30  CMP  (GUMDROP)  Gumdrop's ready.
03 22 21 31  LMP  (SPIDER)  Okay. This is Spider. I missed the first digit in the aft.
03 22 21 38  CC  Roger. Reading aft: 168.
03 22 21 45  LMP  (SPIDER)  NOUN 42.
03 22 21 46  CC  And NOUN 42 - I have no data - / slash A / here.
03 22 22 00  CMP  (GUMDROP)  Roger, Spider. I got the whole thing. You want to read something back?
03 22 22 04  LMP  (SPIDER)  I don't know if Houston is reading me or not.
03 22 22 06  CC  I'm reading you, Spider. Go ahead with the readback.
03 22 22 10  LMP  (SPIDER)  Okay. What's the last digit in the NOUN 42?
03 22 22 20  CC  Okay. Are you asking for the last - Say again what column it is, Rusty.
03 22 22 26  LMP  (SPIDER)  Roger. The last digit in NOUN 42, DELTA-V_R.
03 22 22 32  CC  Roger. DELTA-V_R is 203.
03 22 22 37  LMP  (SPIDER)  Roger. And what is aft component, please?
03 22 22 40  CC  Roger. The aft component is 168.
03 22 22 45  LMP  (SPIDER)  Readback: 94 57 5300, minus 202, plus 004, minus 015 203 / slash A / slash A 3090, minus 1511, aft 168, right 003, up 113.
03 22 23 06  CC  That is affirmative, Spider. Houston confirms the update.
03 22 23 12  CMP  (GUMDROP)  And Gumdrop copies.
03 22 23 15  CC  Roger, Gumdrop.
03 22 23 35  LMP (SPIDER)  Dave, this is Spider here.
03 22 23 38  LMP (SPIDER)  No solution on that one.
03 22 23 41  CMP (GUMDROP)  What do you need?
03 22 23 43  CDR (SPIDER)  Nothing. I just wanted to tell you we got another solution on an elevation angle of 25.05.
03 22 23 47  CMP (GUMDROP)  Okay. I've got another one with elevation angle of 27.26.
03 22 23 51  LMP (SPIDER)  Okay.
03 22 23 53  CMP (GUMDROP)  Beautiful.
03 22 23 55  LMP (SPIDER)  Let's stick together.
03 22 23 57  CMP (GUMDROP)  I'm with you.
03 22 24 54  CC  Spider and Gumdrop, you are GO to go beyond TPI0.
03 22 25 00  CDR (SPIDER)  Roger. Spider here. Understand we're GO past TPI0.
03 22 25 04  CMP (GUMDROP)  Gumdrop copies.
03 22 25 05  CC  Roger. Roger.
03 22 28 17  CDR (SPIDER)  Hey, Dave, we are 49 miles, and we can still see you.
03 22 28 21  CMP (GUMDROP)  Hey, that's pretty good.
03 22 28 26  CDR (SPIDER)  Okay.
03 22 28 27  CC  Spider/Gumdrop. Do you want our guesstimate at your point of closest approach?
Roger. We'd like that.

Roger. It will be 2.7 and the time is 95 plus 17.

Roger. 95 17.

That's affirmative. And I'll be losing you here shortly off Canaries, and we'll see you over Carnarvon at 57.

Roger.

Gumdrop.

SPIDER, this is Houston through Carnarvon. Standing by. And I have an insertion PAD whenever you are ready to copy.

Gumdrop will be about 20 seconds.

Roger. No problem. This is a 7-minute pass, and we will have Honeysuckle shortly thereafter.

Roger.

Spider is reading you. We are in the middle of our alignment.

Roger, Spider. Copy.

Gumdrop is ready any time.

Roger. I would like to hold it, Gumdrop. Spider is in the middle of their alignment.

Roger. I'll wait for them. I'm ready whenever they are.

Very good.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 22 57 35</td>
<td>CMP (GUMDROP)</td>
<td>In the meantime, I can give you gyro torquing angles if you like.</td>
</tr>
<tr>
<td>03 22 57 38</td>
<td>CC</td>
<td>Okay. You cut me off by a few seconds; that was my next question. Go.</td>
</tr>
<tr>
<td>03 22 57 43</td>
<td>CMP (GUMDROP)</td>
<td>Okay. GET 94 57 00, plus 00003, plus 00008, minus 00034.</td>
</tr>
<tr>
<td>03 22 57 58</td>
<td>CC</td>
<td>Roger, Gumdrop. Houston copies.</td>
</tr>
<tr>
<td>03 22 58 04</td>
<td>CMP (GUMDROP)</td>
<td>Gumdrop.</td>
</tr>
<tr>
<td>03 23 01 55</td>
<td>CC</td>
<td>And, Spider, this is Houston. I copy the angle.</td>
</tr>
<tr>
<td>03 23 02 01</td>
<td>CDR (SPIDER)</td>
<td>Roger. Spider.</td>
</tr>
<tr>
<td>03 23 02 10</td>
<td>CC</td>
<td>Roger. Looks like things are going well, and you might bring up your S-band volume. We'll be going over the Honeysuckle in about 2 minutes.</td>
</tr>
<tr>
<td>03 23 02 22</td>
<td>CMP (GUMDROP)</td>
<td>Gumdrop.</td>
</tr>
<tr>
<td>03 23 02 23</td>
<td>LMP (SPIDER)</td>
<td>... this is the Spider.</td>
</tr>
<tr>
<td>03 23 02 56</td>
<td>LMP (SPIDER)</td>
<td>Two miles, Houston.</td>
</tr>
<tr>
<td>03 23 04 04</td>
<td>LMP (SPIDER)</td>
<td>Okay. Spider ready to copy the update.</td>
</tr>
<tr>
<td>03 23 04 06</td>
<td>CC</td>
<td>Okay. We're going to hand off to Honeysuckle. Let's - We'll have about a 30-second breakout, and then we'll pick you back up again.</td>
</tr>
<tr>
<td>03 23 04 17</td>
<td>LMP (SPIDER)</td>
<td>We'll be standing by ...</td>
</tr>
</tbody>
</table>

**Honeysuckle (Rev 60)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 23 05 20</td>
<td>CC</td>
<td>Spider/Gumdrop, Houston through Honeysuckle. How do you read?</td>
</tr>
<tr>
<td>03 23 06 09</td>
<td>CC</td>
<td>Okay, Spider/Gumdrop. I believe I've got you through Honeysuckle, if you are ready to copy.</td>
</tr>
<tr>
<td>Time</td>
<td>Type</td>
<td>Message</td>
</tr>
<tr>
<td>-------</td>
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</tr>
<tr>
<td>03 23 06 14</td>
<td>LMP (SPIDER)</td>
<td>Okay. Spider ready to copy.</td>
</tr>
<tr>
<td>03 23 06 20</td>
<td>CC</td>
<td>Gumdrop, are you with me?</td>
</tr>
<tr>
<td>03 23 06 22</td>
<td>LMP (SPIDER)</td>
<td>Gumdrop - He's on S-band.</td>
</tr>
<tr>
<td>03 23 06 27</td>
<td>CMP (GUMDROP)</td>
<td>Okay.</td>
</tr>
<tr>
<td>03 23 06 28</td>
<td>CC</td>
<td>How do you read, Gumdrop?</td>
</tr>
<tr>
<td>03 23 06 34</td>
<td>LMP (SPIDER)</td>
<td>He doesn't have you latched up yet, Houston.</td>
</tr>
<tr>
<td>03 23 06 39</td>
<td>CC</td>
<td>Okay. I'll give you about another 30 seconds to a minute, and I'll read it.</td>
</tr>
<tr>
<td>03 23 06 45</td>
<td>LMP (SPIDER)</td>
<td>Okay.</td>
</tr>
<tr>
<td>03 23 07 52</td>
<td>CC</td>
<td>Hello, Spider. Houston with your insertion PAD. And, Gumdrop, if you can read.</td>
</tr>
<tr>
<td>03 23 08 00</td>
<td>LMP (SPIDER)</td>
<td>Gumdrop, are you reading Houston yet?</td>
</tr>
<tr>
<td>03 23 08 05</td>
<td>CC</td>
<td>Hey, Rusty, I am going ahead and give it to you.</td>
</tr>
<tr>
<td>03 23 08 07</td>
<td>LMP (SPIDER)</td>
<td>Okay. Go ahead.</td>
</tr>
<tr>
<td>03 23 08 09</td>
<td>C</td>
<td>Roger. Reading insertion: 095 39 0700, plus 00431 all zips, plus 00008 00431 000 104, plus 00431 all zips, plus 00012. End of update.</td>
</tr>
<tr>
<td>03 23 08 56</td>
<td>LMP (SPIDFR)</td>
<td>Roger. Readback - and, Gumdrop, you might get this. 095 39 0700, plus 00431 all zips, plus 00008 00431 all zips 104, plus 00431 all zips, plus 00012.</td>
</tr>
<tr>
<td>03 23 09 23</td>
<td>CC</td>
<td>Okay, Spider. Your readback is correct.</td>
</tr>
<tr>
<td>03 23 09 29</td>
<td>LMP (SPIDER)</td>
<td>Gumdrop, did you copy?</td>
</tr>
<tr>
<td>03 23 09 51</td>
<td>LMP (SPIDER)</td>
<td>Hey, Dave, did you read Jim?</td>
</tr>
<tr>
<td>03 23 09 57</td>
<td>LMP (SPIDER)</td>
<td>Gumdrop, do you read Spider?</td>
</tr>
</tbody>
</table>
Spider, Gumdrop. We will probably lose you here at Honeysuckle in about a minute, and we will see you over the Mercury at 17.

Roger, Houston. This is Spider. Gumdrop, do you read that?

Okay. Gumdrop, be advised we can hear you transmitting, but your voice doesn't come through.

And, Gumdrop, if you got the PAD, how about just giving a blip-blip on your microphone there?

Gumdrop, how do you read Spider?

Reading you loud and clear, Dave. We really lost track of you before. Were you reading us at all?

I was reading you, but I wasn't reading Houston. I missed the insertion PAD.

Okay. We copied. I'll have Rusty give it to you.

This is GET insertion in six parts. Okay!

Okay. We're going to - We're waiting to do a VERB BD ... again.

You're hot.

With a minus 8.

---

Spider/Gumdrop, we have you through the Mercury. You should be right at your point of closest approach, 1.9.

Houston, how do you read Spider?

Spider, I read you loud and clear. Did you copy my last transmission?
03 23 17 48 LMP (SPIDER) All I heard you say was we were at the point of closest approach, that was all. What else did you have to say?
03 23 17 52 CC That was it. And 1.9 miles. Gumdrop, do you read Houston?
03 23 17 58 CMP (GUMDROP) Roger, Houston. I read you five-by.
03 23 18 00 CC And you are five-square, Gumdrop.
03 23 18 04 CMP (GUMDROP) Okay. I never got a lockup over the Honeysuckle.
03 23 18 07 CC Roger.
03 23 18 12 CDR (SPIDER) Houston, Spider here. Our closest approach was 16 000 feet on the radar.
03 23 18 18 CC Roger. Copy. As you went over the hill at Honeysuckle I heard you reading the PAD to Gumdrop. You got it, didn't you, Dave?
03 23 18 25 CMP (GUMDROP) Roger. All squared away. Thank you.
03 23 18 27 CC Roger.
03 23 18 40 LMP (SPIDER) And, Houston, this is Spider. Did you get our torqueing angles on that last alignment?
03 28 18 44 CC That is affirmative. We copied them.
03 23 18 47 LMP (SPIDER) Okay. Fine.
03 23 18 48 CC Looks like things are going well.
03 23 18 51 LMP (SPIDER) Yes.
03 23 19 44 LMP (SPIDER) And, Gumdrop, let us know when you want the track align back.
03 23 19 47 CMP (GUMDROP) Okay. Stand by.
03 23 19 50 CDR (SPIDER) Houston, Spider. When are we going to get the GO for insertion?
Museum: OK...

R: Roger. You ought to have it within the next minute or two. We're looking - taking a look at the data. Everything's looking real good.

O3 23 20 01 CDR (SPIDER) OKAY. Fine. How are we doing on the RCS RED LINE?

O3 23 20 05 CC You're real good. The LM is right on the predicted plot, and Gumdrop is in good shape.

O3 23 20 14 CDR (SPIDER) OKAY.

O3 23 20 37 CC And, Spider and Gumdrop, this is Houston. You are GO for insertion.

O3 23 20 42 CDR (SPIDER) Spider.

O3 23 20 43 CMP (GUARDROP) Gumdrop.

O3 23 21 59 CMP (GUARDROP) Okay, Spider. You can put your light back on. Thanks.

O3 23 21 05 LMP (SPIDER) Roger. ON.

O3 23 21 11 LMP (SPIDER) Okay.

O3 23 21 12 CMP (GUARDROP) Okay.

O3 23 21 32 CC Spider, this is Houston. After insertion, we would like to leave the DPI on for approximately 5 minutes. We'll give you a call when to turn it off.

O3 23 21 42 LMP (SPIDER) Okay.

O3 23 23 12 CC Spider/Gumdrop. About 30 seconds LOS Mercury. We may see you over Redstone around 31; if not, Guaymas at 35.

O3 23 23 23 CDR (SPIDER) Okay.

O3 23 23 24 CMP (GUARDROP) Gumdrop.


(RESTONE (REV 60))

03 23 31 47 CC Spider/Gumdrop, Houston. We have you through the Redstone. Standing by.

03 23 31 54 CDR (SPIDER) Right.

03 23 32 06 LMP (SPIDER) This LM DAP is really a nice flight control system, Houston.

(GUAYMAS (REV 60))

03 23 35 39 CC Spider/Gumdrop. We got good solid lock; good data. Standing by.

03 23 35 46 CDR (SPIDER) Spider.

03 23 35 47 CMP (GUMDROP) Gumdrop.

03 23 36 04 CDR (SPIDER) Gumdrop, on my Mark it'll be 3 minutes.

03 23 36 06 CMP (GUMDROP) Okay.

03 23 36 09 CDR (SPIDER) MARK.

03 23 36 10 CMP (GUMDROP) Right with you.

03 23 36 11 CDR (SPIDER) Okay.

03 23 38 08 CDR (SPIDER) One minute.

03 23 38 09 CDR (SPIDER) MARK.

03 23 38 10 CMP (GUMDROP) Roger. Right with you, and ready to support.

03 23 38 13 CDR (SPIDER) Okay.
03 23 38 48  CDR (SPIDER) Twenty seconds.

03 23 38 51  CMP (GUMDROP) Roger.

03 23 39 14  CDR (SPIDER) Okay. Starting.

03 23 39 15  CMP (GUMDROP) Okay.

03 23 39 16  CDR (SPIDER) Right.

03 23 39 34  LMP (SPIDER) You're on ...

03 23 39 37  CDR (SPIDER) It's a good burn, Dave.

03 23 39 38  CMP (GUMDROP) Very good. Thank you.

03 23 40 24  CDR (SPIDER) Houston, I'll give you R and D telemetry CAL now, and you can call me on the DFI power when you want.

03 23 40 28  CC Roger, Spider. We'll do that. We copied your burn; looked great. And saw your trimming ...

02 23 40 36  CDR Roger. Going to CAL now.

03 23 40 42  CC And, Spider/Gumdop. Whenever you are ready I have your CSI PAD.

03 23 40 52  CMP (GUMDROP) Gumdop. Stand by.

03 23 41 26  CDR (SPIDER) CAL is OFF.

03 23 41 28  CC Roger. Copy. CAL is OFF.

03 23 42 17  CC Gumdop, Houston. We're still showing all entry batteries on the line.

03 23 42 21  CMP (GUMDROP) Roger. I haven't got to it yet. Thank you.

03 23 42 23  CC Roger.
(GOSS NET 1)

03 23 42 48  CMP  How's that?
(GUMDROP)

03 23 42 51  CC  Hey, that's pretty good.

03 23 42 55  CMP  I've got to take care of the left side before I get
(GUMDROP)  the right side.

03 23 42 59  CC  Roger. I didn't know I was rushing you, Dave. I
just wanted to remind you.

03 23 43 03  CMP  Okay. I like those reminders.
(GUMDROP)

03 23 43 05  CC  Roger.

03 23 43 43  CC  Gumdrop, Houston. At your convenience, if you want
     to, before you start your Marks here, just turn on
     the fan in H₂ tank 2.

03 23 43 52  CMP  Roger. H₂ tank 2 fans ON. Now?
(GUMDROP)

03 23 43 55  CC  Roger. Thank you.

03 23 43 59  CMP  Thank you.
(GUMDROP)

03 23 46 59  CMP  Spider, Gumdrop. F20 has you right down the barrel.
(GUMDROP)

03 23 47 02  CDR  Oh, boy!
(SPIDER)

03 23 47 05  CDR  I wasn't able to do a visual lockon on you that time,
(SPIDER)  David, but the range, or the signal strength on the
     radar was well up.

03 23 47 10  CMP  Okay. Good.
(GUMDROP)

END OF TAPE
-- -- --  LMP (SPIDER)  -- Where we can get out of range ... Good thing for the ... stability.
-- -- --  CMP (GUMDROP)  Yes, I bet it is.
-- -- --  LMP (SPIDER)  There's one nice thing to be said about optics, you can look through them and see if you --
-- -- --  CMP (GUMDROP)  Yes, sure can. You're still within range. I can see your four feet.
-- -- --  LMP (SPIDER)  Oh, you know the two parallel lines in the spectrum?
-- -- --  CMP (GUMDROP)  Yes.
-- -- --  LMP (SPIDER)  They are still there right now.
-- -- --  CMP (GUMDROP)  Those are the ones.
-- -- --  LMP (SPIDER)  No, not those. Not the two little specks inside; the one in the center of the reticle.

03 23 49 24  CC  Spider, Houston. DFI OFF. And we are watching your DEKX, wondering when you are going to VERB 93 it.
03 23 49 50  LMP (SPIDER)  Houston, if you are reading Spider, we would sure appreciate a guess at the CSI.
03 23 49 58  CC  Spider, this is Houston. Say again, please.
03 23 50 03  LMP (SPIDER)  Roger. We would appreciate again the CSI time and also where we are going ... final crossing over.
03 23 50 16  CC  Okay, Spider. You are coming in real weak. I have your whole CSI PAD, if you wish it. Your CSI time is 096 16 0300.
03 23 50 36  LMP (SPIDER)  Spider is reading; waiting for the whole PAD.
03 23 50 41  CC  Roger, Spider. How do you read Houston?
Houston, Gumdrop is ready for the whole PAD, too. I believe Spider is reading you. Aren't you, Spider?

Well, I was. I just broke lock on the S-band. I don't know if I'm getting him on VHF or not.

Spider, I'm reading you okay. Can you read me?

Roger. I read you that time, Smokey.

Okay. Going with the CSI PAD: 096 16 0300 097 56 2300, minus 393 all zips 136, minus 392, minus 007; and I want to remind you again of the change in the TPI bias. It is now 4 minutes.

Roger, Smokey. Sorry about that, but you broke up completely there. You are coming in very clear when you come in, but you're just broken. Go ahead and read through real fast now.

Roger. 096 16 0300 097 56 2300, minus 393 all zips 136, minus 392, minus 007; and a reminder that the TPI bias is now 4 minutes.

Roger. Are you still with us, Houston?

That is affirmative, Spider. We've got you now.

Okay, I'll read it back here. You are not coming through too well any more. 096 16 0300 097 56 2300, minus 393 all zips 136, minus 392, minus 007, and 4 minutes on the bias.

That is affirmative, Spider. Your readback is correct. And our COMM will pick up shortly. We will be going to Canaries.

Roger.

Gumdrop copies.

Spider, Houston. We'd like to have descent batteries 1 and 3 off the line.

Houston, are you still reading Spider?
03 23 55 03 CC That's affirmative, Spider. We should have you here for about another 8 minutes.

03 23 55 09 LMP (SPIDER) Roger. Did you hear my request on the apsidal crossing? Please.

03 23 55 15 CC That is negative, Spider. I did not copy.

03 23 55 19 LMP (SPIDER) Roger. We would like your recommendation on first or second apsidal crossing.

03 23 55 29 CC Roger. We copy, Spider. Stand by.

03 23 55 53 CC Spider? Spider, Houston.

03 23 55 58 LMP (SPIDER) Go, Houston.

03 23 56 01 CC Roger. I'm reading you very weak, but we want the second apsidal crossing.

03 23 56 09 LMP (SPIDER) Understand. Second apsidal crossing.

03 23 56 12 CC That's affirm.

CAMARY (REV 61)

03 23 58 15 CC And, Spider, this is Houston. Everything looks good for staging.


03 23 58 23 CC Roger. Copy.

03 23 58 31 CC Go ahead.

03 23 59 59 CMP (GUMDROP) Spider, Gumdrop.

04 00 00 01 LMP (SPIDER) Go ahead.

04 00 00 02 CMP (GUMDROP) I get you 0.4 feet per second out of plane at this time.

04 00 00 07 LMP (SPIDER) Okay. Fine. Thank you.
And, Spider and Gumdrop, this is Houston. We have an update to your CSI PAD. It is the DELTA-\( V_y \) component now reading plus 006.

Roger. DELTA-\( V_y \). Understand plus 006. Is affirmative?

That is affirmative, Spider.

Thank you.

Okay, Spider and Gumdrop. We'll lose you in about a minute and a half off Canary. If you want to talk to me anytime within the next 10 minutes, tell ARIA 5 to go REMOTE.

Okay. We'll do it. Gumdrop.

And we'll see you over Tananarive at 16.

Roger.

Spider. Disregard.

Houston, did you want Spider?

Disregard, Spider.

Okay.

Fifty seconds. ARIA 5, this is Houston CAP COMM. Go REMOTE.

Hello, Spider. This is Houston. Do you read?

Spider, Gumdrop. Did you have anything out of plane?

Gumdrop, Houston. How do you read?

Okay. ARIA 5, this is Houston. Go LOCAL.
(GOSS NET 1)

04 00 11 31 CC Hello, Spider/Gumdrop. This is Houston. How do you read?
04 00 11 38 CC ARIA 5. Do you read? ARIA 5, this is Houston CAP COMM. Go REMOTE.
04 00 11 47 CC ARIA 5, Houston CAP COMM. Go REMOTE.
04 00 12 04 CC Spider/Gumdrop, this is Houston. How do you read?
04 00 16 58 CC Spider, this is Houston. Did you burn?

TANANARIVE (REV 61)

04 00 17 41 CC Tananarive M&O, this is Houston CAP COMM. Do you read?
04 00 17 45 CT Houston CAP COMM, Tananarive. Roger.
04 00 17 47 CC Okay. Have you heard any transmission from the spacecraft?
04 00 17 51 CT That's a negative.
04 00 17 54 CC Are you locked on?
04 00 17 55 CT That's affirmative.
04 00 17 58 CC Spider/Gumdrop. Houston through Tananarive.
04 00 18 44 CMP Thank you.

(GUMDROP)

04 00 18 49 CC Spider/Gumdrop, Houston. Do you read?
04 00 19 00 CC Tananarive M&O, Houston CAP COMM. Go MANUAL key procedure.
04 00 19 05 CT Roger.
04 00 19 07 CC And, Spider - Spider, this is Houston. How do you read?
04 00 19 19 CC Gumdrop - Gumdrop, this is Houston. How do you read?
04 00 20 22 CC And, Tananarive M&O, Houston CAP COMM. Let me know of any transmission you hear between the two spacecraft.
(GOSS NET 1)

04 00 20 28 CT Roger.
04 00 21 42 CC Tananarive W6O, Houston CAP COMM. I think someone there has an open mike.
04 00 21 47 CT Houston CAP COMM, Tananarive.
04 00 21 51 CC Go ahead.
04 00 21 53 CT Roger. We heard one transmission from the spacecraft which said, "Go ahead."
04 00 22 01 CC Okay. Thank you.
04 00 22 02 CC And, Spider. Spider, this is Houston. We'll see you over Carnarvon at 32.

CARNARVON (REV 61)

04 00 32 35 CC Hello, Spider/Gumdrop. Houston through Carnarvon. How did it go?
04 00 32 40 LMP (SPIDER) Houston, this is Spider. How do you read?
04 00 32 41 CC I'm reading you five-square, Spider.
04 00 32 45 LMP (SPIDER) Hey, let me give you the CDH time. It is 96 58 14.
04 00 32 52 CC Roger. Copy 96 58 plus 14, and that is a bias time. Affirmative?
04 00 32 58 LMP (SPIDER) Affirmative. That's the actual time we will perform CDH.
04 00 33 03 CC Roger. Copy.
04 00 33 05 CDR (SPIDER) Houston, this is Spider. How do you read me?
04 00 33 09 CC I'm reading you loud and clear, Jim.
04 00 33 11 CDR (SPIDER) Okay. The staging went okay. We are staged. However, Gumdrop can't find us in his optics any longer, and we may have knocked out our tracking light.
04 00 33 23 CC Roger, Spider. Copy.
Before, we could see it flashing out on our quads out here, and I don't see it flashing now, although the flash may have been reflected off something on the descent stage.

Roger. Understand, Spider.

Okay. And, Houston, this is Spider. I forgot what I was going to ask you.

Houston, I know what I want to tell you. That burn we made was 40 feet per second; 40.0, in case you are interested.

Roger, Spider. Could you give me TIG and DELTA-V Y?

Roger. The TIG of the burn was the TIG that you passed us on the PAD for CSI and DELTA-V Y was 0.

Roger, Spider. Thank you very much.

Roger. And our first solution after CDH, we have a 4-second-early TPI.

Copy, Spider.

Houston, Gumdrop is reading you but very weak.

You are coming loud and clear to me, Gumdrop.

Okay.

And, Spider, this is Houston. The first cut at it, your CDH time looks real good. And could you give me an onboard RCS quantity?

Roger. Onboard RCS is reading 85 and 77.

Roger. 85, 77. Thank you.

Hey, Gumdrop, Spider.

Go.

Roger. Our staging works better than your undocking.
(GOSS NET 1)

04 00 35 57  CMP  (GUMDROP)  Ah ha. You're one up on me.
04 00 36 10  CC  Spider, you had better wait until you get back before you start that.
04 00 36 14  CDR  (SPIDER)  You haven't heard me say anything.
04 00 37 03  CC  Okay, Spider/Gumdrop. We are about 30 seconds LOS Carnarvon. There will be about a 2-minute break. We will see you over Honeysuckle with your S-band volumes up.
04 00 37 12  CDR  (SPIDER)  Roger.
04 00 37 13  CMP  (GUMDROP)  Gumdrop.

HONEYSUCKLE (REV 61)

04 00 38 23  CMP  (GUMDROP)  Spider, Gumdrop. How about a range and range rate reading?
04 00 38 28  CDR  (SPIDER)  Okay. We are at 98.5 miles at 10 feet per second.
04 00 38 44  CMP  (GUMDROP)  Roger. I did. That's pretty good.
04 00 38 49  CMP  (GUMDROP)  Yes. If you can just see me, right?
04 00 39 37  IMP  (SPIDER)  Oh, about 10 minutes before the burn. About 10 or 12 minutes before the burn.
04 00 39 45  IMP  (SPIDER)  You can hold off if you want, but I would like your solution as soon as you can give it to me.
04 00 39 54  CDR  (SPIDER)  Well, don't hold off until . . .
04 00 39 58  CMP  (GUMDROP)  Oh, don't worry.
04 00 40 38  CMP  (GUMDROP)  Spider, Gumdrop. Seven minutes is a little late. I've got to make a 140-degree maneuver at that time.
04 00 40 43 LMP (SPIDER) Okay, Dave. Go when you have to.
04 00 40 46 CMP (GUMDROP) Okay.
04 00 40 56 CDR (SPIDER) Did you get our CDR time?
04 00 40 58 CMP (GUMDROP) Roger. I have the time, but I haven't received any PAD yet. Have you?
04 00 41 02 CDR (SPIDER) Negative.
04 00 41 03 CMP (GUMDROP) Okay.
04 00 41 04 CMP (GUMDROP) They just said that they thought the time looked pretty good.
04 00 41 06 CDR (SPIDER) Okay.
04 00 41 09 CC Spider/Gumdrop, Houston. We're working on the PAD. We've got about 4 minutes LOS here. We'll try to have it.
04 00 41 21 CMP (GUMDROP) You probably didn't hear him, but he said he's working on it, and they'll probably have it before the LOS in 4 minutes.
04 00 41 35 CDR (SPIDER) Roger. We're not reading him.
04 00 41 37 CMP (GUMDROP) Okay. I'll pick it up for you. I might as well do something.
04 00 42 01 CDR (SPIDER) I can have him do a lot of good tracking when it gets daylight.
04 00 42 05 CMP (GUMDROP) But that's what we're built for.
04 00 43 26 LMP (SPIDER) Gumdrop, Spider.
04 00 43 28 CMP (GUMDROP) Go ahead.
Roger. In case I can't hear him on S-band, you might copy down the whole PAD this time. It's only three more lines past when you normally get...

Okay. I've been doing that all the way, anyway.

Okay. Thank you.

Roger.

Spider/Gumdrop, Houston. We're about a minute from LOS, so we'll try to pick up our PAD over the Huntsville at around 47.

Roger, Houston. Gumdrop copies. PAD over Huntsville at 47, and can you transmit to Gumdrop from ...

Gumdrop, transmit to Gumdrop how?

Gumdrop, Spider.

Go.

Okay. Here is the burn: minus 39.2, plus 0.1, and minus 13.7.

Roger. Minus 39.2, plus 0.1, and minus 13.7.

That's Charlie.

Spider, this is Houston. Do you read me?

Roger, Houston. Spider copies.

Roger. I just copied your solution. I have one that's pretty close to it, if you'd like to copy a CDR PAD.
(GOSS NET 1)  

04 00 48 13  LMP  (SPIDER)  Roger. Go.
04 00 48 20  CMP  (GUMDROP)  Go. Gumdrop.
04 00 48 21  CC  Roger. And Roger, Gumdrop. 096 58 1400, minus 382, minus 009, minus 151 305, minus 381, minus 153. End of update.
04 00 48 56  LMP  (SPIDER)  Roger. 096 58 1400, minus 382, minus 009, minus 151 305, minus 381, minus 153.
04 00 49 12  CC  Spider, that is affirmative. Your readback is correct.
04 00 49 21  CMP  (GUMDROP)  Spider, Gumdrop here. I did not copy the update ... I got the ground PAD ... did ...
04 00 49 29  LMP  (SPIDER)  That's affirmative ...
04 00 49 31  CMP  (GUMDROP)  Okay. I've got the ground PAD now, and I'll monitor it ... 1 minute late.
04 00 49 37  LMP  (SPIDER)  Okay. Very good.
04 00 49 53  CDR  (SPIDER)  Do you have all of our solution here, Dave?
04 00 49 58  CMP  (GUMDROP)  Yes, minus 13.7.
04 00 50 01  CDR  (SPIDER)  Okay. That's plus 0.1.
04 00 50 04  CMP  (GUMDROP)  0.1.
04 00 50 06  CDR  (SPIDER)  Alrighty.
04 00 52 49  CC  Spider/Gumdrop, we'll see you over the Redstone at about 03.
04 00 52 58  CMP  (GUMDROP)  Roger. Gumdrop copies. Peistone, 03.
R E D S T O N E  ( R E V  6 1 )

04 01 03 00  C D R  
(SPIDER)  Attaboy. Remember that beer we were talking about the other night? I'll buy you one, Dave.

04 01 03 10  C C  Spider/Gumdrop, Houston standing by. How did it go?

04 01 03 15  C D R  
(SPIDER)  Well, it's sort of a kick in the fanny by comparison to the DPS, but it went all right. Good friend over there in the Gumdrop can see me again. I'm off at daylight.

04 01 03 27  C C  Very good. Understand.

04 01 03 41  C C  Spider, Houston. We are still showing the APS ARMED. Can you verify that?

04 01 03 47  C M P  
(GUMDROP)  Oh, gee.

04 01 03 50  C D R  
(SPIDER)  Yes. Thank you very much. Thank you, Houston.

04 01 03 53  C C  Roger. You're welcome.

04 01 04 06  C C  Spider, this is Houston. Did you burn the solution that I heard you pass to Gumdrop?

04 01 04 13  C D R  
(SPIDER)  I burned the PGNCS solution, which is the one that I passed to Gumdrop.

04 01 04 18  C C  Very good. Understand you burned it and on the time.

04 01 04 22  C D R  
(SPIDER)  That's affirmative.

04 01 04 47  C M P  
(GUMDROP)  ... I don't know.

04 01 04 49  C D R  
(SPIDER)  Gumdrop, why don't you give me your message, and we will relay it to them.

04 01 04 56  C M P  
(GUMDROP)  Okay. Wait just a minute.

04 01 10 45  C D R  
(SPIDER)  And, Gumdrop, Spider. Anytime you want to check your range or range rate, just let us know.

04 01 10 52  C M P  
(GUMDROP)  Okay. Stand by.
04 01 12 51  LMP (SPIDER)  Houston, Spider.
04 01 12 55  CC  Go, Spider. This is Houston.
04 01 12 57  LMP (SPIDER)  Okay. Onboard RCS 42 and 75.
04 01 13 03  CC  Roger. Copy. Thank you very much, Spider.
04 01 13 24  CMP (GUMDROP)  Spider, Gumdrop.
04 01 13 26  CDR (SPIDER)  Go ahead, Gumdrop.
04 01 13 28  CMP (GUMDROP)  I've got 67 miles and 112 feet per second.
04 01 13 30  CDR (SPIDER)  Okay. We have 67 miles and 107 feet per second.
04 01 13 37  CMP (GUMDROP)  How about that.
04 01 13 38  CDR (SPIDER)  Now wait a second; you're still 5 feet per second off. You're going to have to shape that up.
04 01 13 42  CMP (GUMDROP)  Well, let me take some more Marks and I'll get it squared away.
04 01 13 44  CDR (SPIDER)  Right.
04 01 21 20  CDR (SPIDER)  Gumdrop, Spider. For you information, we've got a TFI time. It's 1 minute late right now.
04 01 21 26  CMP (GUMDROP)  Okay. I've got a couple of solutions and I've got 98 03 and 98 04.
04 01 21 32  CDR (SPIDER)  Roger. 97 57 33.
04 01 21 39  CMP (GUMDROP)  97 57 33. Okay.

END OF TAPE
And, Spider/Gumdrop, this is Houston. I have a ground solution when you are ready to copy.

Spider here. Just a moment.

Roger. We're going to have you in contact for about another 12 minutes.

Okay. Spider is here. Ready to copy.

Roger, Spider. Can you take it now, Gumdrop?

Roger. All set. Go ahead.

Roger. Reading TPF: 097 57 4500, plus 196, plus 001, minus 105 223, no roll or pitch, 2670, minus 1010; forward 223 all zips, up 003. End of update.

Roger. Understand. 097 57 4500, plus 196, plus 001, minus 105 223 zips and zips 2670, minus 1010, forward 223 zips, and up 003. And did you count our DSKY on our last recycle?

That is affirmative, Spider. Looks like we're shaping up.

Looks that way.

Gumdrop. Copy.

Roger, Gumdrop.

Spider and Gumdrop, that was our last update. We are going to GO with that PAD.

Spider here. Roger.

Gumdrop. Roger.

Hey, Smokey, is Dave Reed smiling?
Well—yes; he's pretty happy, but he's not going to relax until you've finished burning.

Better not.

Gumdrop, Spider.

Go ahead.

Roger. As soon as we get into the dark, give me a look-see. If you don't see any tracking light—which I guess you won't—we'll put the docking lights on and you might be able to get a Mark on those.

Okay. Might be able to do that at that range.

Right.

At that range with that big eyeball you've got.

Roger.

Houston, this is Spider.

Go, Spider. This is Houston, here.

Roger. Concerning the episode we had coming off the probe, and some little VTO's, we have had after we get back up there, I think it might be wise to go ahead and dock when we get there without waiting until almost dark.

Roger, Spider. We copy, and sounds like a pretty good idea.

Why don't you go through those VTO's and see if there is anything that's really important there, and if so we'll try to get it for you, but otherwise I think we might see if that probe is going to work.

Roger. Understand. We've got that in work.
Tape 63/3
Page 423

(GOSS NET 1)

04 01 32 45
CMF
(GUMDROP)
Spider, Gumdop.

04 01 32 47
CDR
(SPIDER)
Go ahead. Gumdop, Spider.

04 01 32 48
CMF
(GUMDROP)
Okay. Mine's conversion now. I've got 9758 on my current solution.

04 01 32 55
CDR
(SPIDER)
Very good; very good. Ours is now within about 3.7 seconds of the ground's. ... 5741, I think.

04 01 33 01
CMF
(GUMDROP)
I've got 9758 19.

04 01 33 05
CDR
(SPIDER)
Okay; very good. Sounds like we'll all be together then.

04 01 33 12
CMF
(GUMDROP)
How about that?

04 01 34 09
CC
Spider/Gumdop, this is Houston. We're about a minute or so LOS from Canaries. There is an ARIA, if you need it, up to about 42; we'll see you at Carnarvon at 06, and Dave Reed is smiling now. We might catch you at Tananarive at 49, but we haven't had much luck yet.

04 01 34 33
CDR
(SPIDER)
Okay.

04 01 34 48
CC
And, Spider, this is Houston. Did you - Did either vehicle read over Tananarive the last pass when we were calling?

04 01 35 00
CDR
(SPIDER)
Houston, this is Spider. I don't remember. We've been over so many stations so many times, I couldn't tell you.

04 01 35 08
CC
Okay. It was at around CSI, right - immediately after your CSI burn.

04 01 35 14
CDR
(SPIDER)
I read you twice, but it was pretty bad.

04 01 35 18
LWP
(SPIDER)
We called the ... down to you, too, but didn't get any reply.

04 01 35 23
CC
Okay. Thank you.

04 01 35 27
CMF
(GUMDROP)
Gumdop doesn't remember whether he heard you or not.
(GOSS NET 1)

04 01 35 31  CC  Okay.

ARIA (REV 62)

04 01 42 49  CMP  (GUMDROP)  Okay, Spider. I still have you against the earth background.

04 01 42 52  LMF  (SPIDER)  Great.

04 01 42 57  CMP  (GUMDROP)  This thing is really tracking.

04 01 43 00  LMF  (SPIDER)  Do you have a light?

04 01 43 02  CMP  (GUMDROP)  No. It's still daylight to me; you're little black spots; dark on a light background.

04 01 43 17  LMF  (SPIDER)  Okay. We've got about 1425 now.

04 01 43 20  CMP  (GUMDROP)  Okay.

04 01 44 18  LDR  (SPIDER)  Okay. Gumdrop, this is Spider. Our time - ready to copy?

04 01 44 23  CMP  (GUMDROP)  Go ahead.

04 01 44 28  CDR  (SPIDER)  Gumdrop, are you ready?

04 01 44 31  CMP  (GUMDROP)  Roger. Standing by. Go ahead and read it.

04 01 44 33  CDR  (SPIDER)  Okay. 97:57:79.

04 01 44 40  CMP  (GUMDROP)  Okay; good. My last time was 97:58:08.

04 01 44 46  CDR  (SPIDER)  Roger.

04 01 44 47  CMP  (GUMDROP)  That's great.
(GOSS NET 1)

04 01 44 57 CMP (GUMDROP) Ready ... staying in there. ... my mode for a

04 01 45 05 CMP (GUMDROP) ... for a 30h read. I want it for a plus point.

04 01 45 22 CDR (SPIDER) Okay. It's 31.9 no - 34 miles - 3.9.

04 01 45 42 CDR (SPIDER) All right. Okay?

04 01 45 59 CMP (GUMDROP) Okay. We're right on the plot.

04 01 46 04 CDR (SPIDER) Seven --

04 01 46 04 CDR (SPIDER) I don't know; 81 and - unless you call into them.

04 01 46 10 CDR (SPIDER) Dave, here are our DELTA-V's.

04 01 46 13 CMP (GUMDROP) Good. I'm ready to copy.

04 01 46 14 LMP (SPIDER) Roger. Plus 19.4, plus 0.4, minus 9.7.

04 01 46 24 CMP (GUMDROP) Roger. Plus 19.4, plus 0.4, minus 9.7.

04 01 46 31 CDR (SPIDER) Roger. That's correct.

04 01 46 33 CMP (GUMDROP) Good.

04 01 46 39 CMP (GUMDROP) Good. Do you want to compare now?

04 01 46 45 CDR (SPIDER) 19.4; I got 19.6.

04 01 46 50 CMP (GUMDROP) Hello. Spider, Gumdrop.

04 01 46 53 CDR (GUMDROP) Go ahead, Gumdrop.

04 01 46 54 CMP (GUMDROP) You got a...
TANANARIVE (REV 62)

04 01 50 05 CC Spider and Gumdrop, Houston through Tananarive. Standing by. I did copy your final solution; sounds great.

04 01 50 13 CDR Roger. Spider.

04 01 50 26 CC Spider, Houston. The only one I wasn't sure of was your DELTA-V_x. I read it as 197.

04 01 56 17 CC Spider/Gumdrop, this is Houston. We will see you over Carnarvon at 06.

04 02 03 46 LMP Yes, I know it.

04 02 03 49 CMP Are you all set up for the docking?

04 02 03 52 LMP Roger.

CARNARVON (REV 62)

04 02 04 09 CMP Okay.

04 02 04 12 LMP I want to get of that ...

04 02 04 14 CMP Roger.

04 02 05 02 CDR Okay, Dave. We're calling for our first midcourse.

04 02 06 07 CDR Okay, Dave. I've got our DELTA-V's for you.

04 02 06 10 CMP Go ahead.

04 02 06 11 CDR X is minus 1.0, Y is 0 - is minus 0.3, and Z is plus 0.9.

04 02 06 25 CMP Well, you can't hardly argue with that.
04 02 06 27 CDR (SPIDER) No, I think I'll go ahead and burn them here.

04 02 08 29 CMP (GUMDROP) Did you finish?

04 02 08 30 CDR (SPIDER) Okay. Midcourse is complete?

04 02 08 31 CMP (GUMDROP) Roger.

04 02 11 45 CC Spider/Gumdrop, Houston. We're about one minute LOS Carnarvon. We'll see you over the Huntsville in about 8 minutes.

04 02 11 50 CDR (SPIDER) Okay, Houston. What have you decided about that post - or after I get up there? Should I go ahead and dock or not?

04 02 11 56 CC Okay, Jim. We're looking through here and there are a couple of things we really would like to have and that's some pictures taken of the ascent engine area, and we would like to get the rendezvous radar corona test.

04 02 12 12 CDR (SPIDER) Okay. Depends on when I break out of sunlight, what I can do for you.

04 02 12 15 CC Okay; very good.

04 02 12 19 CDR (SPIDER) And I'm going to go into darkness; wondering how we're going to get the probe fixed.

04 02 12 22 CC Okay; we understand. And have you talked this over with Dave? We haven't heard his comments on the probe.

04 02 12 33 LMP (SPIDER) Dave, can you hear him?

04 02 12 39 CMP (GUMDROP) Roger, Houston. You copy Gumdrop?

04 02 12 41 CC We've got Gumdrop here, but I'm going to lose you in just a few seconds. We'd like to have your comments on the probe, too, over Huntsville up here.

04 02 12 50 CMP (GUMDROP) Okay, and be ready to give me a GO for the PYRO ARM there too, please.
04 02 12 54  CC  Okay; very good.

HUNTSVILLE (REV 62)

04 02 19 49  LMP  Okay; about 15 seconds ago, Dave.  
(SPIDER)

04 02 19 52  CMP  Roger.  
(GUMDROP)

04 02 20 04  CMP  Hey, Rusty.  
(GUMDROP)

04 02 20 21  LMP  Okay ... we will.  
(SPIDER)

04 02 20 24  CMP  Okay.  
(GUMDROP)

04 02 20 30  CMP  What kind of range rate do you have?  
(GUMDROP)

04 02 20 32  LMP  I have 18 700. Right now, it's 42 feet per second.  
(SPIDER)

04 02 20 39  CMP  All right. I've got 3.0 miles at 43 feet per second.  
(GUMDROP)

04 02 20 44  LMP  Okay.  
(SPIDER)

04 02 20 46  CMP  What's your pitch angle?  
(GUMDROP)

04 02 20 48  LMP  It's about 86 degrees - something like that.  
(SPIDER)

04 02 20 53  CMP  Okay.  
(GUMDROP)

04 02 21 24  LMP  You can let -  
(SPIDER)

04 02 21 35  LMP  Dave, do you want to get some pictures of the  
(SPIDER)  ascent engine area?

04 02 21 40  CMP  Roger. I got that. Thanks.  
(GUMDROP)
04 02 21 42 LMP (SPIDER) Okay.

04 02 21 45 CMP (GUMDROP) Oh, I see you out there coming in the sunlight.

04 02 21 48 LMP (SPIDER) Great.

04 02 21 51 CMP (GUMDROP) You're the biggest, friendliest, funniest looking spider I've ever seen.

04 02 22 01 CC And, Spider/Gumdrip, Houston. We are copying you through the Huntsville - next five minutes.

04 02 22 06 LMP (SPIDER) Okay.

04 02 22 09 CC And, Gumdrip, in regards to your last request, we have no TM here at the Huntsville in regards to that PYRO ARM.

04 02 22 20 CMP (GUMDROP) Roger. Understand.

04 02 22 42 CM (GUMDROP) Houston, Gumdrip.

04 02 22 49 CC Go, Gumdrip. Houston.

04 02 22 53 CMP (GUMDROP) Roger. We've got a bird here. The only thing I could think of on that probe is that my fingers slipped off of the switch before it got all the way out. Other than that I just can't think of a thing.

04 02 23 04 CC Roger. That's about the only thing we can come up here with - that you didn't hold the switch long enough, Dave. I guess - How do you feel about it? You think it's anything - any problem?

04 02 23 23 CMP (GUMDROP) No, I really don't. I went back to see if they ... a way out to retract, and I had the barber poles which said they had extended all the way. Then I went up to extend again and it dropped right off.

04 02 23 30 CC Roger, Gumdrip. Copy.

04 02 24 10 CDR (SPIDER) Dave, I think what we'll do is come on up and stop out front there and pitch over so you can look at our ascent engine, then pitch back around.
04 02 24 19  CMP (GUMDROP)  Okay.
04 02 24 26  CMP (GUMDROP)  I agree. We ought to get on with it.
04 02 24 28  CDR (SPIDER)  Yes.
04 02 24 38  CMP (GUMDROP)  What kind of range do you have now?
04 02 24 40  CDR (SPIDER)  I have 9000 feet and a range rate of 32-1/2 feet per second.
04 02 24 45  CMP (GUMDROP)  Thank you.
04 02 24 47  CDR (SPIDER)  I have just a little bit of line-of-sight rate up.
04 02 24 51  CMP (GUMDROP)  Roger.
04 02 24 53  CMP (GUMDROP)  I have just about 9000 feet and 33.
04 02 24 55  CDR (SPIDER)  Okay.
04 02 25 22  CDR (SPIDER)  Okay. I'll turn on my line-of-sight rate now, Dave.
04 02 25 25  CMP (GUMDROP)  Okay.
04 02 26 51  CDR (SPIDER)  Okay. I just went to 6000 feet at 30 feet per second.
04 02 26 54  CMP (GUMDROP)  Okay.
04 02 27 05  CC  Okay. We copy you. Right on the breaking schedule, Spider. And we'll see you over Hawaii in about 3 minutes.
04 02 27 38  CDR (SPIDER)  Okay, Dave. I can see you.
HAWAII (REV 62)

04 02 29 53  CDR  Boy, are you bright, Dave. I'm not sure I'm going to be able to see to dock with this COAS I have.

04 02 30 38  CDR (SPIDER)  Okay. I'm at 950 feet, 14 feet per second.

04 02 30 41  CMP (GUMDROP)  Okay. Sounds pretty good.

04 02 30 49  CC  Spider/Gumdrop, we've got you through Hawaii now good and solid, and I copied your last transmission; sounds great.

04 02 30 55  CDR (SPIDER)  Roger.

04 02 31 07  CMP (GUMDROP)  Your thrusters are little yellow dots.

04 02 31 09  CDR (SPIDER)  Yes. They're really throwing a lot of stuff off.

04 02 31 18  CDR (SPIDER)  Okay. We're 5 feet per second, about 610 feet.

04 02 31 24  CMP (GUMDROP)  Okay.

04 02 31 29  CMP (GUMDROP)  But you are upside down, again.

04 02 31 31  CDR (SPIDER)  Yes. I was just thinking one of us isn't right-side up.

04 02 31 39  CMP (GUMDROP)  Boy, you've got contraptions hanging out all over.

04 02 31 44  CDR (SPIDER)  That's show biz.

04 02 32 16  CDR (SPIDER)  Okay. I have us about 370 feet.

04 02 32 19  CMP (GUMDROP)  Okay. Looks closer than that.

04 02 32 21  CDR (SPIDER)  Doesn't it, though?
04 02 32 33  CDR (SPIDER)  Okay. Got your camera out so you can take a picture of my bottom half?
04 02 32 36  CMP (GUMDROP)  Roger. Why don't you come all the way in and stop and then pitch over?
04 02 32 40  CDR (SPIDER)  Yes, that's what we're doing. We come on in and stop, and then you're going to take over station-keeping and I'll pitch around.
04 02 33 09  CMP (GUMDROP)  Give me a Mark next time you turn your thrusters on.
04 02 33 12  CDR (SPIDER)  Okay, 3, 2, 1.
04 02 33 14  CDR (SPIDER)  MARK.
04 02 33 17  CMP (GUMDROP)  Thank you.
04 02 33 23  CC  How does that sports car handle, Jim?
04 02 33 26  CDR (SPIDER)  Pretty nice.
04 02 33 50  CDR (SPIDER)  Okay, Davey. It says 100 feet on the radar tape. It looks a little closer to that to me, but what do you say we stop here?
04 02 33 56  CMP (GUMDROP)  Okay. That's a good idea.
04 02 34 04  CDR (SPIDER)  Okay. I'll get a STOP and STABILIZE and then give it to you.
04 02 34 28  CMP (GUMDROP)  Okay. That looks pretty good to me.
04 02 34 30  CDR (SPIDER)  Okay, good.
04 02 34 34  CDR (SPIDER)  Let me take a couple of pictures of your nose; then I'll start pitching around.
04 02 34 37  CMP (GUMDROP)  All right.
04 02 34 42  CMP (GUMDROP)  Okay. You tell me while I guide it, okay?
Okay, babes. You've got it now.

Alrighty; I've got it.

I don't even see you in there, David.

Oh, I'm here.

I've been waiting for you to bring that good water back.

Okay, Dave. We're going to start up on AUTO MANEUVER here, and we're going to pitch up; then you can take a picture of our bottom.

Alrighty.

Here we go. 2 degrees per second.

Okay, half-degree per second.

That's a little better.

It's quietened down a little bit if it looks funny.

I'm - We're looking at you.

Looks like a big black hole where an engine used to fire.

Okay. Get a picture of it, I guess.

I've got a couple. Why don't you just keep going the way you're going?

Okay.

You've got another 20 degrees to go.
Okay. I can see injectors. As a matter of fact, I can even see the chamber right now.

Okay, fine. Let's take another picture there, and we're going to maneuver back around.

Okay. This will be 2 degrees per second.

Okay. Go ahead; I've got the pictures.

How fast you going to do this one?

2 degrees a second.

Okay.

Say a Mark before you start, will you?

Okay.

I'll maneuver now, Dave. You ready?

Go.

Houston, for your information we could never get the radar to unlock, so we couldn't ...

Roger. Understand. The rendezvous radar stayed locked.

Okay. I guess the next order of business is to get set up.

Roger. Get set up and let's get on with the docking.

Okay. Do you want to stationkeep on me?

I've got it.
(GOSS NET 1)

04 02 42 32
CMP
(GUMDROP)
You've got it.

04 02 42 41
CC
Gumdrop, Houston. We're standing by for your logic and PYRO ARM.

04 02 42 46
CMP
(GUMDROP)
Roger, Houston. Thank you. Logic on my Mark: 3, 2, whoops! Stand by. Okay, 3, 2, 1.

04 02 42 55
CMP
(GUMDROP)
MARK.

04 02 42 57
CC
Roger. Copy.

04 02 43 08
CC
And, Gumdrop, Houston. You are GO for PYRO ARM.

04 02 43 11
CMP
(GUMDROP)
Roger. Understand. Go for PYRO ARM. Pyros arming now.

GOLDSTONE (REV 62)

04 02 43 34
CMP
(GUMDROP)
Okay. Houston, this is Gumdrop here. I've got the full-extent/retract switch in RETRACT. I've got two barber poles. Should have a couple of grey, I believe.

04 02 43 50
CC
Roger, Gumdrop. We copy.

04 02 44 13
LMP
(SPIDER)
When did they go on barber pole, Dave?

04 02 44 17
CMP
(GUMDROP)
Well, when I checked them for full extension before, they were barber pole.

04 02 44 38
CMP
(GUMDROP)
Roger. Maybe that's right, huh?

04 02 44 44
CMP
(GUMDROP)
Okay. Now, I went - now, I cycled again out to EXTEND and now back to RETRACT, and I've got two grey.

04 02 44 50
LMP
(SPIDER)
Okay.

04 02 44 51
CMP
(SPIDER)
So I think we're all right now.

04 02 44 53
LMP
(SPIDER)
Yes. Let's get on with it and see if we really are.
Okay. Do you want to try AUTOMATIC RETRACT?
Let's try AUTOMATIC RETRACT just like we talked about it.
Okay.
Why don't you do your roll? When you do that, then I'm - How's the sun? Would you be able to dock on top of me if I can't see you?
I'm in good shape sunwise.
Okay. Fine.
Maybe we ought to not try AUTOMATIC RETRACT, because what if I - There's something sort of worrying me. If I hit the RETRACT now, it might go.
Okay; fine. That's a good idea - excellent idea. Let's leave it where it is, and when I punch in you pull me in.
Spider, Houston.
Go ahead.
Roger. Would you verify your DAP load prior to this docking?
Roger. The DAP's four balls 2.
Okay. Thank you very much.
Houston, Gumdrop.
Go, Gumdrop.
I think we're okay on the probe now. Do you concur?
Roger. It sounds like it's okay now, Dave. Yes we concur.
Okay.

Okay, Spider, I'll do stationkeeping when you turn around.

Why don't you do your roll first, Dave?

Alrighty. Here we go.

... window over on the other side.

Rolling left 60.

Roger.

Okay. I'm holding now, 60-degree left roll. Could you stand by 1 second while I turn the docking light on for you?

Sure.

Okay. I've got it, Dave - very faintly.

Okay. Stand by.

Okay. All set. Tighten that band and the whole works.

Okay, Dave. You stationkeep and I'm going to pitch over.

Okay.

Hey, you've still got the target.

Good.

And the drogue.
Right there looks pretty good.

Okay. You've got it?

Not yet.

Okay.

Okay. I can't see my COAS against you right now; let me get up closer.

All right. Okay. You've got the stationkeeping, right?

I've got it.

All right.

I've got to look through the top of my helmet. Am I beaded up?

You've got to come back quite a ways, to your rear.

Easy does it.

Whoops! Too far.

Yes, I know.

It looks like a sporty little machine.

It's not even going in the right direction.

Houston, Gumdrop. What time is sunset?

It's 99:15, Gumdrop.

Okay. We got about 25 minutes.
That's affirmative.

I just can't even see the COAS, Dave. I don't know exactly where you are with respect to it.

Okay. You want me to do it?

No. Let me work my way in here a little closer.

Okay.

Dave, I just can't see it. Let me get in a little closer.

You're coming fine. Just keep coming easy like that. Looks like you are coming from an angle, but you are coming in with the right attitude. You ought to go forward and to your right a little bit, relative to your body.

You're fine.

Right there.

That doesn't look like it to me.

You get to come in from an angle anyway, so you're doing good.

Your yaw is off about 2 degrees.

I just can't see the darn COAS. I can't see what my attitude is.

Yes.

Okay. I'm lined up in translation, but I can't tell what my attitude is, Dave.

If I don't see it - There it is, there.
04 02 56 24 CMP Now you're coming in. (GUMDROP)
04 02 56 27 CMP That's looking better. (GUMDROP)
04 02 56 30 CMP There you go. (GUMDROP)
04 02 56 32 CMP I think you've got a handle on it now. (GUMDROP)
04 02 56 34 CDR It keeps disappearing. (SPIDER)
04 02 56 39 CMP Okay. Now you're looking pretty good. (GUMDROP)
04 02 56 59 CMP Okay. You're moving into the boundary. You're inside the capture boundary now. (GUMDROP)
04 02 57 13 CMP You're okay. (GUMDROP)
04 02 57 18 CMP Looking good. (GUMDROP)
04 02 57 22 CDR Okay. I can see it now. (SPIDER)
04 02 57 33 CDR Thing's really sporting. (SPIDER)
04 02 57 34 CMP Sure is; I can tell. You are looking good. (GUMDROP)
04 02 57 46 CMP Keep it coming. (GUMDROP)
04 02 57 55 CMP Almost there. (GUMDROP)
04 02 58 08 CMP Okay. You are about there. (GUMDROP)

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(SC OSS NET 1)

ASCENSION (REV 63)

SC ... about here.

CMP Yes.

(CUIMDROP)

CMP I have capture.

(CUIMDROP)

CDR Very good!

(SPIDER)

LMP Great!

(SPIDER)

CMP Okay. Let's get her lined up.

(CUIMDROP)

CDR Okay. Why don't you do it? I can't tell where it is. We're in FREE now.

(SPIDER)

CC Good收缩, Spider.

(SPIDER)


(SPIDER)

OC Roger. 55 and 55. Thank you, Rusty.

(SPIDER)

LMP Hang on.

(GUIMDROP)

CMP Did you get the latches?

(GUIMDROP)

SC ...

(CUIMDROP)

CDR Whee! I haven't heard a sound like that in a long time!

(SPIDER)

CMP And it's a very nice docking.

(GUIMDROP)

CDR ... That wasn't a docking; that was an eye test!

(SPIDER)

CDR Okay, Houston. We're locked up.

(SPIDER)
Sounds like you passed the 20-10, Jim. That sounded real beautiful. Good show.

Okay, Spider. I'm in FREE and you're in FREE, and you may proceed into the tunnel here when I get squared away.

Okay, Dave. We'll start getting ready for the unmanned APS.

Okay. Why don't you take a break for a while?

No, we've still got a lot to do.

Man, when I take a break, I'm going to bed for three days.

Roger.

Houston, did you get that?

Roger, Spider. Houston copies.

We concur. Three days off.

What is that? Saturday and Sunday and Christmas?

That was a hard day's work; and it looked real good, troops.

Thank you, Smokey. I may ... -- Smokey, you still there?

-- Yes, Jim. We've still got you for about another minute here.

Okay. Listen, I hope the whole world's listening, but I tell you I think we got greatest set of flight controllers that we've - is anyplace that can be found. I'd like to thank you all, and I'm sure that the rest of the guys up here would too.

Roger, Spider. We copy. Thank you very much.
(GOSS NET 1)

04 03 02 36 CT  Go ahead.
04 03 02 43 CT  ...
04 03 03 37 CC  ARIA 6, this is Houston CAP COMM.
04 03 03 42 CT  Houston CAP COMM, ARIA 6.
04 03 03 44 CC  Roger. Do you hear anything from the spacecraft?
04 03 03 49 CT  That's negative at this time. We don't have an S-band signal.
04 03 03 53 CC  Okay. If you get a lockup, would you call me on air-to-ground here? I'd like to talk to them.
04 03 03 59 CT  That's roger.

ARIA 6 (REV 63)

04 03 05 38 CC  Roger.
04 03 06 07 CT  Houston, this is ARIA 6. Is two-way lock modulation ON?
04 03 06 12 CC  Roger, ARIA 6. Go REMOTE.
04 03 06 15 CT  Roger. We're REMOTE.
04 03 06 19 CC  Hello, Spider/Gumdrop. This is Houston through ARIA 6. How do you read?
04 03 06 41 CC  Spider, this is Houston through ARIA 6. Do you read?
04 03 07 14 CC  Okay, ARIA. You can go LOCAL. I guess we aren't going to get them. We'll try them through Ascension. Thank you.

ASCENSION (REV 63)

04 03 07 19 CDR Go ahead, Houston. You just came in.
(SPIDER)

04 03 07 22 CC  Roger. Spider, we are curious about the option on the ACT star alignment. Are you going to do that?
(GOSS NET 1) Tap

04 03 07 48 CDR (SPIDER) Houston, I don't know - how long do you have we have until that docked - that on-band AFS burn, now?

04 03 07 57 CC Stand by.

04 03 07 59 CDR (SPIDER) I've got my flight plan tucked under my belt right now.

04 03 08 26 CMP (GUMDROP) And, Houston, anytime you've got it, we'll take the update on the P30 for the AFS burn.

04 03 09 07 CT Roger. Over and out.

04 03 09 09 CC Spider, Houston.

04 03 09 12 CDR (SPIDER) Go ahead.

04 03 09 14 CC Roger. The first opportunity we have, that we feel we can make, is about 102 hours; it's 101:52.

04 03 09 26 CDR (SPIDER) Okay. I'm just wondering about our difficulty in trying to clean up big messes when we're moving things back and forth; and if we take too much time out, I was concerned about getting the thing ready. We'll see how things go here. Okay?

04 03 09 45 CC Okay. There is - The first opportunity is a little over an hour from now, and I didn't even want to pass that on to you. It's your decision, but I don't think you can make that one.

04 03 09 57 CDR (SPIDER) Yes. I kind of doubt it, too.

04 03 10 01 CC Okay. We concurred to not even shoot for that one, and we're looking now at 101:52.

04 03 10 11 CC Gumdron, do you see Houston?

04 03 10 15 CMP (GUMDROP) Houston, did you call Gumdron?

04 03 10 18 CC Roger. If we are going to do the AOT star alignment - I guess it'll depend on how things go, but I have some gimbal angles you'll need for that. I can give them to you anytime you want, if you want them at all.
04 03 10 32  CMP (GUMDROP) Well, why don't you give them to me? Let me get a piece of paper, here, and we'll have them if we can use them.

04 03 10 37  OK Okay.

04 03 10 50  CMP (GUMDROP) Gumdrop is ready to copy.

04 03 10 52  CC Roger. For star 15: roll 35 36 32 81 365; and star 25: 34 74 26 61 35 97.

04 03 11 23  CMP (GUMDROP) Roger. Copy. For star 15: 35 36 32 81 365; for star 25: 34 74 26 61 35 97.

04 03 11 37  CC Roger. That is confirmed, Gumdrop. And one fast question: did you ever see the tracking light on Spider?

04 03 11 44  CMP (GUMDROP) No; it was out when he got here.

04 03 11 46  CC Understand.

04 03 11 54  CMP (GUMDROP) But the way this navigation works in here, you hardly need a nightside pass.

04 03 12 00  CC Gumdrop, Houston copies. Sounds great.

04 03 12 04  CMP (GUMDROP) ... go next flight.

04 03 14 43  CC Spider, Houston.

04 03 14 55  CC Spider, Houston.

04 03 15 00  CMP (GUMDROP) Houston, Gumdrop. Go.

04 03 15 01  CC Gumdrop, would you relay to Spider that we would sure like to have him check that OPS heater again before he stows that OPS that had failed? I'm going to lose you here, and we'll try to talk to you over Tananarive at around 25.

04 03 15 16  CMP (GUMDROP) Roger. Understand. Spider, they want you to check the OPS heater, the one that failed, before you put it away.

04 03 15 25  CDR (SPIDER) Okay.
They got it, Houston.

Roger, Gumdrop. Copy. And I copied Spider there.

Spider/Gumdrop, this is Houston through Tananarive
Standing by.

Gumdrop, are we in any kind of --

I fired that one, Dave. Hey, right now we are in
the right kind of attitude.

Hey, listen. Maybe if you went to FREE, and we
took control here, we could just jockey around
and do it.

We have it.

... Spider/Gumdrop, Houston through Tananarive.

Spider/Gumdrop, this is Houston transmitting in
the blind. I'm not picking you up. We would
like to recommend you use the LM RCS just as
much as possible. We used just a little more
command module CSM RCS there than we'd predicted
on the rendezvous.

Okay, Houston. This is the Spider here. We're
using our RCS thrusters.

Okay. Real good.

And, Spider/Gumdrop, this is Houston through
Carnarvon.

Roger, Gumdrop.
04 03 41 08 CC  And, Spider, do you read Houston. Are you too - Gumdrop, if they're too busy to answer, let me know.

04 03 41 18 CMP (GUMDROP)  Go ahead. Houston, Gumdrop.

04 03 41 20 CC  Roger. Do you know if Spider's reading me or is just too busy - can't answer me?

04 03 41 27 CDR (SPIDER)  We were reading you; we were kind of busy, Stu.

04 03 41 30 CC  Okay, Gumdrop. At a convenient time, would like for you to pass to them this - We want to do a couple of steps on that AGS system troubleshoot - that warning light - prior to then doing the AGS give align and update.

04 03 41 51 CMP (GUMDROP)  Okay. We'll do that.

04 03 41 53 CC  Okay.

04 03 42 17 CC  Gumdrop, Houston. We're noticing your surge tank down a little.

04 03 42 22 CMP (GUMDROP)  Roger. That could be from the tunnel PRESS.

04 03 42 26 CC  Roger.

04 03 42 36 CMP (GUMDROP)  Boy, it is down a little, isn't it?

04 03 42 40 CC  That's roger.

04 03 42 42 CMP (GUMDROP)  Okay. Spider, Gumdrop.

04 03 42 46 CDR (SPIDER)  Go ahead.

04 03 42 47 CMP (GUMDROP)  Hey, listen, we're dropping off quite a bit on our surge tank, and I think it might be either the tunnel or you. The latches look good; I think we've got a good seal. How are you doing over there?

04 03 43 09 LMP (SPIDER)  Okay. We got our cabin pressure way up to - We're 5.9. In fact, we're going to relieve it in a minute here.
Okay. Listen, maybe you ought to open that door. The surge tank is down to 400, and we ought to do something here pretty quick.

Roger.

Gumdrop, Houston. Could you check your cabin air return valve?

How about that.

Is the tunnel okay, Dave? I'll open up the door.

Yes. I've got the probe out.

Okay. Open the hatch.

And, Gumdrop, that's the suit return valve we'd like to have you take a look at.

Roger. You're right. That one was still closed.

I had just taken my helmet and gloves off after going into the tunnel, and I hadn't opened that.

Okay, Houston. I see it. Surge tank's going back up.

Okay. Thank you, Gumdrop.

Thank you, Smokey.

Roger.

Houston, here's your dock alignment. Do you have the star angle difference?

Stand by, Spider, just one.

Okay. It's 5 zeros – give you the torque –

Hi, Dave!
Houston, are you ready to copy torqueing angles?

Okay. I have them now.

Okay. Understand you’ve got the torqueing angles.

Affirmative, Spider. I have the torqueing angles.

Okay.

And that’s pretty good on that star angle difference. Way to work, big team!

Yes. Crazy? It’s a little longer.

Yes. It’s real swinging, and we’re about to lose you at Carnarvon in 30 seconds, and we’ll see you over Hawaii at 04.

Roger. Will you have a PAD by that time?

That’s affirmative. I have the PAD in my hand now.

Okay. We’ll see you at Hawaii with it.

Roger.

Spider/Gumdrop, this is Houston through Hawaii.

Hello, Hawaii, Gumdrop. We’re making progress.

Roger. Understand. And whenever you all are ready, I have your APS depletion PAD and your LM jettison attitude.

-- Rusty;

Stand by.
Roger.

And, Spider, Houston. We'd like to uplink your state vector. I noticed you are in POO now. We can go if you will give us permission.

Is that for Spider or Gumdrop?

That was for Spider.

Roger, Houston. Say again. This is Spider.

Roger, Spider. You are in POO. We'd like to uplink you a state vector.

Okay. Go ahead. And I am ready to copy your PAD.

Okay. And are you ready - Okay. Here is the APS depletion: 101 52 4400, plus 52356, minus 52682, plus 00520 74275 314 023. Guess you really didn't need those, did you? Okay. Plus 48549, minus 52675, plus 19626. That's the end of the APS depletion PAD. And your LM weight: 9549.

Okay. On the readback I got 101 52 4400, plus 52356, minus 52682, plus 00520 74275 314 023, plus 48549, minus 52675, plus 19626; and LM weight: 9549.

Roger. And for the jettison attitude, I have angles for either the CSM or the LM, if you wanted to maneuver with the LM - save a little command module CSM RCS fuel.

Okay. Go ahead with them. I don't know which one we'll do.

Okay. Reading the angles for the LM: roll 314, pitch 023, yaw 011; and the CSM angle: 310.5, 282.0, 044.7. And we are through with the computer.

Roger. I understand that you are through with the computer. Be advised our docking ring angle now has changed, and therefore, I think, probably the CSM angles will have to be modified to a certain extent. Docking ring angle is now minus 0.2.
Roger. Understand docking ring is minus 0.2. How come you were so sloppy in roll there?

I don't think I'll say anything to that.

(Laughter)

Okay. And, Rusty, we've got a little troubleshooting, here, on the AGS - we'd like to do on that warning light. We don't know if you want to take the time or not.

Spider, this is Houston. Do I still have you?

All right. Go ahead, Houston.

Roger. We've got a procedure here that we'd like to do concerning the AGS, and it's that caution light - We'd like to have you do this procedure prior to the AGS update in your checklist.

Are you ready to copy?

Stand by. How long is it?

It's about five steps.

Okay. Stand by.

Okay. Go ahead.

All right, Houston. Go ahead.

Roger. Step 1 is: perform normal turn-off procedure. Verify the AGS caution light goes out. Open, then close the caution CWEA circuit breaker. Perform the normal turn-on procedure. And then, after you have done this, why, reset the AGS time and update and align as normal checklist.

Okay. You want a normal AGS turnoff. You want to verify the AGS caution light out. Open and
close CWEA breaker, perform a normal turn-on and update and align the AGS.

04 04 11 23 CC That is affirmative, Spider.

04 04 11 51 LMP Hey, Jim. Are you going to do that checklist?
(SPIDER)

04 04 11 56 LMP Okay. Seems to me there's one more thing I have got to get down here; I can't think of what it is ...
(SPIDER)

REDSTONE (REV 64)

04 04 12 24 CC Spider, Houston. We should have you through the Redstone now.

04 04 12 32 CT Redstone here.

04 04 12 34 CC Roger. Rusty, we also would like to request that you bring the LM COAS back into the CSM.

04 04 12 44 LMP Roger. Do you have data at the Redstone here, Houston?
(SPIDER)

04 04 12 49 CC That's affirmative.

04 04 12 51 LMP Roger. Do you want me to go through that procedure right now?
(SPIDER)

04 04 12 54 CC On the AGS? Yes, let's do.

04 04 12 59 LMP Coming up.
(SPIDER)

04 04 13 04 OHP Houston, Gumdrop.
(GUMDROP)

04 04 13 06 CC Go ahead, Gumdrop.

04 04 13 08 OHP Roger. Do you have any suggestions on anything else we might leave in the LM to lighten up the command module?
(GUMDROP)

04 04 13 17 CC We copy that. Stand by. We'll put that in work. We'd like to have you turn off the fan in H2 tank 2.

04 04 13 25 SC All right.
04 04 13 34  LMP  (SPIDER) The light is still on. ... caution light came on when I went to STANDBY on the powerup again, and it stayed on after pushing in the AEA breaker and going to OPERATE.

04 04 13 52  CC  Roger. We copy.

04 04 14 01  CC  Okay. We have no more questions. Rusty, if we could get you to cycle the track light on and off, we've got data now. Could you do that for us?

04 04 14 13  LMP  (SPIDER) Spider. Track light on; track light off.

04 04 14 25  CC  Okay. Rusty, could you do that for us once more? On your Mark.

04 04 14 30  LMP  (SPIDER) Roger. 3, 2, 1.

04 04 14 32  LMP  (SPIDER) MARK.

04 04 14 33  LMP  (SPIDER) Track light on. Let me know when you want it off.

04 04 14 36  CC  Okay. Turn it off on your Mark.

04 04 14 39  LMP  (SPIDER) Roger. 3, 2, 1.

04 04 14 41  LMP  (SPIDER) MARK.

04 04 14 42  LMP  (SPIDER) Track light off.

04 04 14 46  CC  Okay. Thank you very much. And one other change to your checklist: in the closeout here, we want you to change - put the S-band antenna on the number 2 AFT position. This is rendezvous, page 11, step 10.

04 04 15 08  LMP  (SPIDER) Roger. S-band antenna to AFT.

04 04 15 16  CC  And, Spider, one other thing. We would like to - This is on rendezvous-h2, step 5. Do not ascent feed system A. Leave system A in NORMAL and system B to ASCENT FEED INTERCONNECT.
04 04 15 41  LMP  (SPIDER)  Understand. Do not ASCENT INTERCONNECT SYSTEM
      ... Gumdrop, did you get that?
04 04 15 55  CDR  (SPIDER)  Yes. He didn't want one of the ascents interconnected,
      but I don't know whether it was A or B.
04 04 16 00  CC  Spider, it is do not connect - interconnect system
      Alfa. Interconnect system Baker only.
04 04 16 08  CDR  (SPIDER)  Roger. Bravo only; and negative on the Alfa inter-
      connect.
04 04 16 12  CC  Very good. Thank you.
04 04 16 24  SC  ...
04 04 16 26  CC  Okay. Rusty, one other thing: we want you to
      leave the track circuit breaker open.
04 04 16 39  LMP  (SPIDER)  Roger. Is that the track light circuit breaker?
04 04 16 42  CC  That is affirmative. Your track light circuit
      breaker. It's rendezvous-13; step 3. We would
      like that open.
04 04 16 49  LMP  (SPIDER)  It's open now.
04 04 16 50  CC  Very good. Thank you.
04 04 16 57  LMP  (SPIDER)  Okay, Jim.
04 04 17 04  LMP  (SPIDER)  Commander.
04 04 17 07  CDR  (GUMDROP)  Roger. Do you read?
04 04 17 08  LMP  (SPIDER)  Roger. Now I do.
04 04 17 09  CDR  (GUMDROP)  Commander's suit isolation with suit disconnect;
      connect the LM hoses and stow; CDR transfer to the
      CSM with the ISA and the CDR rendezvous checklist -
      I've done that - We've got the index, and we've
      got the PLSS cartridge over here.
04 04 17 25  CDR  (GUMDROP)  And do you have PLSS stowed now?
LMP  Roger. Go ahead. I have everything stowed on the floor. Go ahead and read it.

CDR  Okay. LM switch closeout for jettison ordeal; lighting off.

LMP  Lighting off.

CDR  Master arm OFF.

LMP  Master arm OFF?

CDR  ON, I mean. Master arm ON.

LMP  ON. Okay.

SC  ...

CDR  Audio, commander: S-band T/R OFF.

LMP  OFF.

CDR  Relay OFF.

LMP  Relay OFF?

CDR  Roger. S-Band T/R OFF, relay OFF.

LMP  Roger.

CDR  Next step. Guidance control PGNCs.

LMP  Guidance control PGNCs.

CDR  Channel control AUTO.
04 04 17 58 LMP (SPIDER) Node control —
04 04 18 01 CDR (GUMDROP) — negative. Throttle control AUTO.
04 04 18 03 LMP (SPIDER) Throttle control AUTO.
04 04 18 07 CDR (GUMDROP) Manual throttle COMMANDER.
04 04 18 08 LMP (SPIDER) Manual throttle COMMANDER.
04 04 18 10 CDR (GUMDROP) Engine arm OFF.
04 04 18 14 LMP (SPIDER) Engine arm OFF.
04 04 18 15 CDR (GUMDROP) Ascent helium REG's 1 and 2 tb — grey.
04 04 18 18 LMP (SPIDER) Ascent helium REG's 1 and 2 grey.
04 04 18 20 CDR (GUMDROP) Abort stage flush and guarded.
04 04 18 23 LMP (SPIDER) Roger. Your first word is cutting out every time. Abort and abort stage flush and guarded.
04 04 18 38 LMP (SPIDER) — barber pole.
04 04 18 39 CDR (GUMDROP) System A and B quad 1, 2, 3, 4, (8) tb — grey.
04 04 18 43 LMP (SPIDER) Roger. I verify it.
04 04 18 44 CDR (GUMDROP) CRSFD — tb — barber pole.
04 04 18 47 LMP (SPIDER) CRSFD tb — barber pole.
04 04 18 49  CDR  (GUMDROP)  System A and B main shutoff valve tb - grey.
04 04 18 53  LMP  (SPIDER)  A and B shutoff, grey.
04 04 18 56  CDR  (GUMDROP)  Attitude monitor to AGS.
04 04 19 01  LMP  (SPIDER)  Attitude monitor to AGS.
04 04 19 05  CDR  (GUMDROP)  Think that must be your ball. Right?
04 04 19 07  LMP  (SPIDER)  Yes. It's on the LMP side.
04 04 19 09  CDR  (GUMDROP)  Glycol to pump 1.
04 04 19 12  LMP  (SPIDER)  Glycol to pump 1.
04 04 19 14  CDR  (GUMDROP)  O_2 H_2O quantity monitor - caution and warning RESET.
04 04 19 19  LMP  (SPIDER)  -- RESET.
04 04 19 21  CDR  (GUMDROP)  Next step. Attitude control (3) to MODE CONTROL.
04 04 19 25  LMP  (SPIDER)  In MODE CONTROL.
04 04 19 27  CDR  (GUMDROP)  MODE CONTROL, ATT hold.
04 04 19 30  LMP  (SPIDER)  MODE CONTROL, ATT hold.
04 04 19 32  CDR  (GUMDROP)  RCS system A/B-2, quad 1, 2, 3, i; AUTO.
04 04 19 37  LMP  (SPIDER)  AUTO.
04 04 19 38  CDR  (GUMDROP)  Exterior lighting OFF, they have here. Where do they want it, TRACK or OFF?
04 04 19 41  LMP  (SPIDER)  OFF.
<table>
<thead>
<tr>
<th>Time</th>
<th>CDR</th>
<th>LMP</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>ACA/4 jet (2), ENABLE.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>Roger. ENABLE.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>TTCA/TRANSLATION (2), ENABLE.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>TTCA/TRANSLATION (2), ENABLE.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>Inverter to number 2.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>Inverter is on 2.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>BATT 5 and 6 backup feed (2) - ON tb - grey.</td>
</tr>
<tr>
<td>04:04</td>
<td>LMP</td>
<td></td>
<td>Backup feed's on tb - grey.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>BATT 5 and 6 normal feed (2) OFF/RESET, tb - barber pole.</td>
</tr>
<tr>
<td>04:04</td>
<td>LMP</td>
<td></td>
<td>OFF/RESET, tb - barber pole.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>Here's something I can't read. Audio -</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td></td>
<td>Jim, that's audio LMP.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>Thanks. Audio LMP. S-band T/R, OFF.</td>
</tr>
<tr>
<td>04:04</td>
<td>LMP</td>
<td></td>
<td>S-band T/R - bye bye, Houston, OFF.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>Relay, OFF.</td>
</tr>
<tr>
<td>04:04</td>
<td>LMP</td>
<td></td>
<td>Relay, OFF.</td>
</tr>
<tr>
<td>04:04</td>
<td>CDR</td>
<td>LMP</td>
<td>S-band - FM prim prime, OFF. PCM, range OFF, HI.</td>
</tr>
<tr>
<td>04:04</td>
<td>LMP</td>
<td></td>
<td>Got it.</td>
</tr>
</tbody>
</table>
(GOSS NET 1)  

04 04 20 53  CDR  Tape, OFF - to barber pole. Hey, we didn't get ...
(GUMDROP)  

04 04 20 56  LMP  Okay. I got it.
(SPIDER)  

04 04 20 57  CDR  Did you get the tape off of there?  
(GUMDROP)  

04 04 20 59  LMP  I'll get it.  
(SPIDER)  

04 04 21 00  CDR  Okay. Why don't you get it and throw it in here now so that we won't forget it?  
(GUMDROP)  

04 04 21 03  LMP  S-band AFT.  
(SPIDER)  

04 04 21 04  CDR  FORWARD or AFT.  
(GUMDROP)  

04 04 21 09  CC  That was a change. We want that on number 2 AFT.  

04 04 21 14  CDR  Okay. S-band 2 AFT.  
(GUMDROP)  

04 04 21 17  LMP  Jim, you'll have to say that one again. I missed it after we talked about the tape recorder. You bypassed me there.  
(SPIDER)  

04 04 21 23  CDR  Okay. S-band number 2 AFT.  
(GUMDROP)  

04 04 21 26  LMP  Roger. Got it.  
(SPIDER)  

04 04 21 28  CDR  Next step: suit gas diverters go to EGRESS.  
(GUMDROP)  

04 04 21 31  LMP  Suit gas diverters, fully egressed.  
(SPIDER)  

04 04 21 33  CDR  Cabin DEPRESS: CLOSE.  
(GUMDROP)  

04 04 21 36  LMP  Cabin DEPRESS is in CLOSE.  
(SPIDER)  

04 04 21 39  CDR  PLSS fill, CLOSE.  
(GUMDROP)  

04 04 21 40  LMP  PLSS fill, CLOSE.  
(SPIDER)
04 04 21 42
CDR
(GUARDIAN)
Descent 02, CLOSE.

04 04 21 45
LMP
(SPIDER)
Is that descent, Jim?

04 04 21 46
CDR
(GUARDIAN)
Descent. Descent 02, CLOSE.

04 04 21 48
LMP
(SPIDER)
Roger. Got you.

04 04 21 50
CDR
(GUARDIAN)
Ascent number 1 02, CLOSE.

04 04 21 55
LMP
(SPIDER)
I think that was ascent number 1 02, CLOSED.
I don't know why you're cutting out, but the first words are cutting out, Jim.

04 04 22 00
CDR
(GUARDIAN)
Just a second. Let me check some of the switches.

04 04 22 06
CDR
(GUARDIAN)
Yes. These are the same kind I've always used.
Let me check another lead here.

04 04 22 12
CC
Rusty, how do you read Houston?

04 04 22 14
LMP
(SPIDER)
You're five-square, Houston.

04 04 22 16
CC
Do you want me to read the list?

04 04 22 19
LMP
(SPIDER)
No. That's okay.

04 04 22 20
CC
Okay.

04 04 22 21
CDR
(GUARDIAN)
Houston, how do you read me?

04 04 22 22
CC
I read you loud and clear, Jim.

04 04 22 24
CDR
(GUARDIAN)
Okay. I guess we're incompatible up here.

04 04 22 27
CDR
(GUARDIAN)
Okay. That's ascent number 1 02 closed.

04 04 22 32
LMP
(SPIDER)
Roger. Ascent number 1 02 closed.
04 04 22 34  CDR (GUMDROP)  Ascent number 2 O₂, OPEN.
04 04 22 37  LMP (SPIDER)  Ascent number 2 O₂, OPEN.
04 04 22 39  CDR (GUMDROP)  Suit isolation (Commander), SUIT DISCONNECT.
04 04 22 42  LMP (SPIDER)  SUIT DISCONNECT.
04 04 22 44  CDR (GUMDROP)  Suit circuit relief, AUTO.
04 04 22 46  LMP (SPIDER)  Circuit relief, AUTO.
04 04 22 48  CDR (GUMDROP)  Cabin gas return to EGRESS.
04 04 22 50  LMP (SPIDER)  Cabin gas return going EGRESS.
04 04 22 52  CDR (GUMDROP)  Cabin relief and dump (2) to AUTO.
04 04 22 56  LMP (SPIDER)  Cabin relief and dump: the forward is AUTO, and I'll put the upper in AUTO.
04 04 23 02  CDR (GUMDROP)  Okay. DFI primary, ON; secondary, OFF.
04 04 23 06  LMP (SPIDER)  DFI, DFI primary, ON; secondary, OFF.
04 04 23 11  CDR (GUMDROP)  Okay. LMP transfer to the CSM umbilicals. We'll send them down to you in just a minute.
04 04 23 16  LMP (SPIDER)  Okay.
04 04 23 18  CC  Hey, Rusty. Houston. I want to remind you again that you're going to have to put new time in the AGS. That procedure we gave you wiped the time out of the AGS.
04 04 23 27  LMP (SPIDER)  Roger, Houston. Thank you.
04 04 23 57  CC  And, Rusty. Want to remind you again of that new LM weight we passed you.
Roger. Understand.

... there it goes. That was some state VEC you gave me. It integrated forever.

Roger. Understand.

Hey, Rusty, are you still up there?

Yes.

Okay. Are you switched over to the umbilical yet?

No. I'm loading the AGS here, Jim; just a minute.

Okay.

Okay. Want me to transfer over now?

...

Are you still on LM COMM, or on our COMM?

I'm on LM COMM.

Okay.

Stand by. I'll switch it over.

... GSN umbilicals. And when you do that, we'll turn your suit flow on, and we'll turn your audio power off over here so we can switch over to it.

Okay. Dave?

Boy, sure getting a bunch of noise.
04 04 29 30 LMP (SPIDER) Dave?

04 04 29 56 LMP (SPIDER) Okay. You can turn on my suit flow, Jim.

04 04 29 59 CDR (GUMDROP) Okay.

04 04 30 02 CDR (GUMDROP) Okay. Your suit flow is on.

04 04 30 05 LMP (SPIDER) Okay. And I'm going to be disconnecting the COMM here; and give me about a minute and you can connect up there.

04 04 30 10 CDR (GUMDROP) Okay. Just a minute.

04 04 32 12 CC And, Gumdrop, this is Houston. At any convenient time - Stand by one, Gumdrop. Disregard that.

04 04 32 22 CDR (GUMDROP) Okay. We will disregard your message.

04 04 32 24 CC Roger. Understand.

04 04 32 53 CC Okay. Gumdrop, Houston. If you've got one of the troops in there with a spare hand to write, I could give you your block data now. That would be one thing out of the way for tonight.

04 04 33 05 CDR (GUMDROP) Okay. Just a minute.

04 04 33 07 CC Roger.

END OF TAPE
--- --- --- CC

Houston. If you've got one of the troops there with a spare hand to write, I could give you a block data. That would be one thing out of the way tonight.

--- --- --- CDR

(GUMDROP)

Okay. Just a minute.

--- --- --- CC

Rog.

04 04 33 42 LMP

(SPIDER)

Houston, this is Spider, I guess.

04 04 33 48 CC

Roger, Spider I guess. This is Houston, I know.

04 04 33 53 LMP

(SPIDER)

Okay. If you can see the DSKY right now, you'll notice that the angles for NULL 16 do not correspond with what you passed me on the data.

04 04 34 05 CC

Okay, Rusty. That's something that I was wanting to get to you. The angles that I passed you were FDAO angles.

04 04 34 10 LMP

(SPIDER)

Roger. That's what I'm looking at, FDAO angles. However, yaw is not constrained, and it's a possibility that if we went to a right yaw angle that the pitch and roll would come in.

04 04 34 27 CC

Roger. We agree with that, and we're having guidance refigure these angles now, Spider.

04 04 34 47 CDP

(GUMDROP)

Houston, go ahead with the block data if you like.

04 04 34 50 CC

Okay. I've got about a minute here; I'll start reading: 065 by Baker, plus 338, minus 1699, and Spider, we're saying if you do go to those angles - if you yaw, do that 011. That way we will have the right angles.

04 04 35 17 LMP

(SPIDER)

Okay.

04 04 35 19 CC

I'm going to lose you here, Gumdrip. I'll finish up this block data over Ascension, and we'll hit Ascension at 42.

04 04 35 28 CDP

(GUMDROP)

Understanding.
04 04 42 32  CC  Apollo 9, Houston.
04 04 42 49  CC  Apollo 9, Houston.
04 04 43 23  CC  Apollo 9, Houston through Ascension.
04 04 43 26  CMP (GUMDROP)  Hello, Houston. This is Apollo 9. The Gumdrop ... right now, and we seem to not have the right angles on our DSKY ...
04 04 43 58  CC  Apollo 9, this is Houston. You sort of dropped out on me. We're showing the right angles on the LM DSKY. Are you saying your angles are not correct in the command module?
04 04 44 48  CC  Apollo 9, Houston.
04 04 45 04  CC  Apollo 9, Houston. If you read us, we are showing both vehicles in the proper attitude - proper angles.
04 04 45 46  LMP (SPIDER)  Hey, Houston, this is Spider.
04 04 45 49  CC  Go, Spider.
04 04 45 51  LMP (SPIDER)  Roger. I want to notify you that on the AGS all day long, 417 has been jumping to a plus 1. I'm going to set it back to zero here, but there isn't a snowball's chance it's going to stay there until the burn time.
04 04 46 10  CC  Roger. Copy. Understand.
04 04 46 17  CMP (GUMDROP)  And, Houston, this is Gumdrop here. Do you want us to be in minimum deadband to hold this thing here now?
04 04 46 26  CC  Stand by, Gumdrop.
04 04 47 29  CC  Gumdrop, Houston.
04 04 47 40  CC  Gumdrop, this is Houston. If you read, we recommend in the CSM in MIN deadband.
04 04 47 47  CMP (GUMDROP)  Okay.
(GOSS NET 1)

04 04 49 00  CC  And Gumdrop/Spider, we'll see you over Carnarvon at 14, if you read.

04 04 49 09  CMP (GUMDROP)  14.

04 04 49 17  LMP (SPIDER)  Hey, Houston, Spider.

04 04 49 19  CC  Go ahead, Spider.

CARNARVON (REV 64)

04 05 14 00  CMP  Houston, Apollo 9.

04 05 14 02  CC  Houston. Roger. We're standing by for your logic switches.

04 05 14 07  CMP  Okay. Before that, do you have a separation attitude for us?

04 05 14 12  CC  Affirmative. SEP attitude: roll, 137.4; pitch, 092.5; yaw, 021.9. And note your TIG is 101 plus 32 plus 44.

04 05 14 40  CMP  Okay. 137.4, 092.5, 021.9, at a TIG of 101 32 44. You're right there today.

04 05 14 52  CC  Yes. Roger.

04 05 14 57  CMP  Okay. What's our jettison time to get off the LM?

04 05 15 10  CMP  Houston, we're ready to ... update.

04 05 15 16  CC  Okay. We're standing by for your logic.

04 05 15 25  CMP  All right. Logic bus ON at this time.

04 05 15 38  CC  Apollo 9, Houston. You have a GO for PYRO ARM.

04 05 15 43  CDR  Roger.

04 05 15 44  CMP  Houston, one other question: what time do you want us to jettison the LM - What time do you want us to get off the LM? Do you have any preference?

04 05 15 52  CC  Roger. Ten minutes prior to your SEP maneuver or at 22.

04 05 15 56  CMP  Okay. Understand 22.
Roger. Just to clarify one thing in the procedure, there, in exiting the LM. We left the ascent interconnects on system Alfa CLOSED and on Bravo OPEN. We also ran the same configuration on the main shut-off valve; that is, we closed the main shut-off valve in system Bravo and left it open in Alfa. Hopefully, that's what you wanted.

9, Houston. Affirmative; that's good.

Okay; thank you.

9, Houston. Thirty seconds to LOS; Guam at 25, and it's looking good.

Okay; fine. Thank you.

9, Houston. Just as a reminder, we didn't see your pyros on yet.

Okay. I'll get them on in just another minute or two.

Apollo 9, Houston through Guam. Standing by.

Apollo 9, Houston.

Okay. Stand by, Houston.

Roger.

9, Houston. Thirty seconds LOS; Hawaii in about 39.

Roger.

9, Houston. Recommend limit cycle OFF.

Say it again.

Recommend limit cycle OFF.
Apollo 9, Houston through Hawaii.

Hello, Houston. This is Apollo 9. We were able to get that SEP maneuver off in the direction that we had intended. We did an automatic maneuver in the PCMCs that very carefully placed us gimbal lock, so we thrust out to the side of it, and we have it in right. We're all clear.

Roger. Understand you are well clear and we have a GO, then, for the LM maneuver.

Affirmative.

Roger.

Houston, Apollo 9.

Houston. Go.

Roger. Could you refresh us on the burn time?

Roger. The burn time is at 52 plus 44.

Thank you.

9, Houston. The burn time is really 53 plus 44. I can give you a clock time here at 11 minutes, or do you want it?

Okay.

15 seconds to 11 minutes.

Okay.

4, 3, 2, 1.

MARK.

Eleven minutes.

Roger.

9, Houston. The LOC is all set up, and the engine is ARMED.

Roger. Very good.
<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 05 51 17</td>
<td>CC</td>
<td>Apollo 9, Houston. About 2 minutes to go; do you still feel comfortable in your position?</td>
</tr>
<tr>
<td>04 05 51 22</td>
<td>CDR</td>
<td>Oh, yes. We're well clear.</td>
</tr>
<tr>
<td>04 05 51 23</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 05 53 27</td>
<td>CDR</td>
<td>He's burning like mad, Houston. Looks real nice.</td>
</tr>
<tr>
<td>04 05 53 31</td>
<td>CC</td>
<td>Very good; it's looking good down here.</td>
</tr>
<tr>
<td>04 05 53 34</td>
<td>LMP</td>
<td>Hey, it's really moving out.</td>
</tr>
<tr>
<td>04 05 53 23</td>
<td>CMP</td>
<td>Houston, that engine's still burning away like mad.</td>
</tr>
<tr>
<td>04 05 54 27</td>
<td>CC</td>
<td>Very good. We've got about 4-1/2 more minutes, and it looks like about the only thing we got is a very slight pitch oscillation.</td>
</tr>
<tr>
<td>04 05 55 03</td>
<td>CDR</td>
<td>We can still see him out there, Houston. He's really a long ways away.</td>
</tr>
<tr>
<td>04 05 55 07</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 05 55 11</td>
<td>CDR</td>
<td>I hope I didn't forget anything onboard it.</td>
</tr>
<tr>
<td>04 05 55 14</td>
<td>CC</td>
<td>We do, too.</td>
</tr>
<tr>
<td>04 05 55 18</td>
<td>CC</td>
<td>Did you get the LMP?</td>
</tr>
<tr>
<td>04 05 55 20</td>
<td>CDR</td>
<td>No. I didn't forget him. I left him there on purpose. (Laughter)</td>
</tr>
<tr>
<td>04 05 55 24</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 05 55 33</td>
<td>CMP</td>
<td>And, Houston, we have fuel cell 2 warning light on.</td>
</tr>
<tr>
<td>04 05 55 43</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 05 55 44</td>
<td>LMP</td>
<td>... C E, Houston.</td>
</tr>
<tr>
<td>04 05 55 47</td>
<td>CC</td>
<td>Roger. It looks like condenser exhaust.</td>
</tr>
<tr>
<td>04 05 55 50</td>
<td>LMP</td>
<td>Yes.</td>
</tr>
<tr>
<td>04 05 55 51</td>
<td>CMP</td>
<td>Roger. It's the same thing we've been seeing all day.</td>
</tr>
</tbody>
</table>
TEXAS (REV 65)

04 05 59 14 CDR Hey, Houston. Do you read Apollo 9?
04 05 59 17 CC Houston, Roger. We've got about 45 seconds yet. We just had shutdown.
04 05 59 20 CMP Roger. He put out a big cloud of white stuff.
04 05 59 25 CC Roger. Copy.
04 05 59 27 LMP He's sure a long ways away.
04 06 00 08 CDR Houston, Apollo 9.
04 06 00 09 CC Houston. Go.
04 06 00 10 CDR Roger. What time do you expect to give us the block data?
04 06 00 14 CC Roger. I'll give it over MILA at 57.
04 06 00 21 CDR Okay. 102 57.
04 06 00 24 CC Roger. Negative. 101 57.
04 06 00 29 CDR Alrighty. ... 200.
04 06 00 30 CC Wait a minute. I've got the wrong data here.
04 06 00 43 CC Be at MILA at 22.
04 06 00 45 CDR Roger. 22.

ANTIGUA (REV 65)

04 06 04 57 CC Apollo 9, Houston through Antigua.
04 06 05 08 CC Apollo 9, Houston through Antigua.
04 06 05 46 CC Apollo 9, Houston through Antigua.
04 06 06 07 LMP Houston, Apollo 9.
04 06 06 12 CC 9, Houston. I'll give you a couple of block datas here, and then we'll recompute them and give you everything with block data 12.
(GOSS NET I)

04 06 06 21  CDR  Okay.
04 06 06 29  LMP  You're free to read them.
04 06 06 30  CC   Okay. 066 4 Bravo, plus 338, minus 1699 102
                  56 23 4825; 066 3 Alfa, plus 312, plus 1446
                  104 20 28 4824.

END OF TAPE
Apollo 9, Houston through Tananarive.

Houston, Apollo 9. How do you read?

Oh, not too bad. Same thing from Tananarive. We'll try it, though.

We've got a couple of questions for you.

Roger. Go.

Okay. First, fuel cell 2 seems to be slipping down the power curve there; we're about 2 AMPS low on it. The PTU is still running high and kicking on the MASTER ALARM every once in a while. The other question is H₂ pressures. Tank 1 is now registering about 261 or so and — oh, yes — 275. Tank 2 is about — Tank 1 is about 262, and tank 2 is about 275.

Okay. I think that last thing you were talking about was H₂ tank pressures, and if it's gone up above 260, go ahead and turn them off. We plan to pump them up again tonight and let them decay while you are sleeping.

Roger. We cut the heaters off on the H₂ cryo.

9, Houston. Are you still with me?

Houston, 9. We've broken. We've got the H₂ heaters ... off at the present time.

Roger. Copy. We'll delete BATT A charge tonight.

Apollo 9, Houston through Guam.


Roger. We have your state vector; we request POO and ACCEPT.

Okay. You have POO in ACCEPT.
Roger.

We didn't copy much over Pretoria and Tananarive. Will you say again what you were talking about on the fuel cells and the cryos?

Okay. I think you turned the H₂ heaters off there, I hope.

That's affirmed.

And when you turned them off, did you go from the ON position, or from the AUTO position to OFF?

We went from AUTO to OFF.

Okay; afraid of that.

Didn't like that, huh?

No.

Pressures were getting up pretty high. Do you want to go to ON now?

Okay. Let me tell you our plans now. What we'd like to do is take them on up to 275-270, sorry - by your MANUAL cycle and then heaters and fans OFF. We'd like to do that just as late as we can prior to your rest cycle.

Okay. We'll run them up to 270 and then turn them off and leave the heaters and fans off, too; is that right?

Yes; for the night. And we're hoping we can get a 12-hour decay there before we hit the MASTER ALARM again.

Okay; but you want to leave everything off over-night. Is that right?

That is affirmative.

Okay.

Hey, you might tell Jim we got a - Papa Alpha Tango and about three little ones here really proud of today's operations.

What did you say, Ron?

I said we've got Papa Alpha Tango back there in the back room and three little ones, and they are really proud of today's operations.
Say hello to those four, would you, please?
Will do.
On second thought, I'll say hello. Hello, there.
Okay, 9. We'd like to delete the BATT A charge. Very well.
Okay. For RETRO's needs down here, he would like to know - We'd like to get a list of the non-checklist items that you left in the LM and also the non-checklist items that you might have brought back from the LM.
Okay. Stand by one.
And while you're standing by, how about the fuel cell, what do you think about that?
Okay. On the fuel cell, what we're hoping is that as soon as we power down, the exhaust temperature - It should come down, and also it ought to even up the load again.
Okay.
We're not too hot about doing an H₂ purge because - of course - it uses is little bit of hydrogen there.
Yes, that's true. Do you want to do any O₂ purges tonight?
Whatever's on the flight plan.
Okay. We'll do an O₂ purge.
Go.
We left a great big bag - temporary storage bag - it's about 3 feet long and a foot wide and a foot thick over on the LM, and it was full of garbage; food wrappers and things like that. It didn't weigh very much, but it probably must have weighed 10 pounds or so. We didn't bring anything significant back with us in the way of weight.
We do have a lithium hydroxide canister out of the ... and that's probably the heaviest item that we have, and we haven't found a place to stow it yet. Let me - It's probably down somewhere on the aft bulkhead. Probably down towards the lower equipment bay.

04 07 03 44 CC Okay. We copy that.
04 07 03 51 CC Apollo 9, Houston. How about the COAS - LM COAS, did it come back?
04 07 03 56 CDR Oh, Roger. I got the LM COAS.
04 07 03 57 CC Okay. Good.
04 07 04 04 CDR I don't think we have anything that weighs anything, though. I tell you what we'll have to do, Ron. We brought the books back. We got all the checklist stuff back with us, but we didn't have time to sort out the numbers so we have two whole - That probably weighs another 5 or 8 pounds.
04 07 04 21 CC Okay. We understand that.
04 07 04 23 CDR And we'll have to rearrange some of the things on the spacecraft, and we'll let RETRO know where we put them. Okay?
04 07 04 29 CC Okay. Good idea.
04 07 04 41 CC 9, Houston. You've got it up there and we've checked and compared. So I've got a NAV check, but I don't think you'll need it.
04 07 04 50 CMP Oh, if you say it's a good one, it's a good one. We'll take what we got.
04 07 04 54 CC Roger. Jim, a question to you. Did you do another OPS check, and if so, any results?
04 07 05 03 CDR I checked the OPS again, and the light still didn't come on.
04 07 05 07 CC Roger. Copy.
04 07 05 09 CDR Yesterday Rusty checked it and he couldn't get - The light didn't come on. I went over and checked it again and it came on fine. As a matter of fact, they came on four or five times. Then I went ahead and left it there, didn't say anything about it;
I just thought we hadn't done it right. Went back over there today and they didn't work at all for either one of us.

Okay.

Houston. Check your middle gimbal.

Roger. We see. We're going to power down the platform here in a minute.

Okay.

HAWAII (REV 65)

Apollo 9, Houston through Hawaii.

Roger. Houston, Apollo 9. Go.

Roger. Got you loud and clear, now. Dave, while I've got you there, we haven't had any EKG on you all day, so when you - You might do a little troubleshooting here this evening sometime.

I'll tell you one reason you don't have it right now, is that I'm not plugged in.

Yes, but we didn't have any all day long on you, just on the EKG part of it. We had the respiration.

Let's square away the block data first, though.

Okay. We're working on the block data, and we should have it before we leave here.

Okay. I'll be all set.

By the way, our LOS of Texas is about 30.

Okay.

We're curious if you might have any additional comments on the LM jettison there.

No. It went off pretty clean. We had a bang like a regular pyro, and pushed us back with a - I guess something like 4/10 of a foot-per second. It's sort of hard to tell, but that's what it felt like; it was supposed to be. It looked like a clean separation, the docking ring looked clean, and we
couldn't see too much of it because it went away pretty fast. And gosh, we must have been a mile and a half away when it finally burned.

04 07 16 47  CC  Okay.

04 07 16 49  CDR  The maneuver to the separation attitude didn't work out so good. I guess we never tried it in a simulator. We sort of slipped into gimbal lock, but I think we got to the right position.

04 07 17 03  CC  Okay.

04 07 17 06  CC  Okay. And by the way, the LM is in an orbit 37—about 3750 miles by 125.

04 07 17 14  CMP  Oh really?

04 07 17 15  CC  Yes.

04 07 17 22  CC  9, Houston. We could also use some dosimeter readings.

04 07 17 25  CMP  We thought you'd probably ask for that.

04 07 17 27  CC  Roger.

04 07 17 36  CMP  Okay. Rusty's was 8012, and nine and Jim's are packed way down on the bottom of somewhere.

04 07 17 44  CC  I understand. 8012. Your waste water is up to about 90 percent now, so you may be wanting to dump that a little bit early.

04 07 17 52  CMP  Okay. We were going to do it at 104, but I guess we can do it here in a jiffy. Thank you.

04 07 18 51  CC  Apollo 9, Houston. You might tell Jim that his guests can hear him now. They didn't hear him before.

GOLDSTONE (REV 65)

04 07 21 41  CC  Apollo 9, Houston. I have your block data when you're ready to copy.

04 07 22 06  CMP  Go ahead, Apollo 9.

04 07 22 13  CC  9, Houston. You ready to go for block data on REV 66?

04 07 22 20  CMP  Roger. You read?
04 07 22 23 CMP
I guess you didn't read me for a minute there. Okay. Go ahead; I'm ready.

04 07 22 27 CC
Okay. 066 3 Alfa, plus 312, plus 1446 104 20 28 4824; 067 3 Bravo, plus 338, plus 1485 105 54 57 4816; 068 3 Alfa, plus 317, plus 1446 107 27 50 4789; 069 Charlie Charlie, plus 268, plus 1390 109 03 44 4786; 070 Charlie Charlie, minus 231, minus 1600 110 53 53 4540; 071 Charlie Charlie, minus 313, minus 1600 112 27 57 4310; 072 Alfa Charlie, plus 133, minus 0330 113 35 29 4748; 073 2 Alfa, plus 261, minus 0310 114 39 06 4827; 074 Alfa Charlie, plus 322, minus 0320 116 12 55 4859. And GPS trim: pitch, minus 0.89; yaw, minus 1.12. Over.

04 07 26 15 CMP
Roger. I missed the first two lines of the one that came after area 069 Charlie Charlie - the next area.

04 07 26 26 CC
Okay. Area 070 Charlie Charlie latitude: minus 231.

04 07 26 40 CMP
And the longitude?

04 07 26 41 CC
Longitude: minus 1600.

04 07 26 47 CMP
Okay. You ready to have them come back?

04 07 26 50 CC
Roger. Go.

04 07 26 51 CMP
066 3 Alfa, plus 312, plus 1446 104 20 28 4824; 067 3 Bravo, plus 338, plus 1485 105 54 57 4816; 068 3 Alfa, plus 317, plus 1446 107 27 50 4789; 069 Charlie Charlie, plus 268, plus 1390 109 03 44 4786; 070 Charlie Charlie, minus 231, minus 1600 110 53 53 4540; 071 Charlie Charlie, minus 313, minus 1600 112 27 57 4310; 072 Alfa Charlie, plus 133, minus 0330 113 35 29 4748; 073 2 Alfa, plus 261, minus 0310 114 39 06 4827; 074 Alfa Charlie, plus 322, minus 0320 116 12 55 4859, with a pitch trim of minus 0.89 and a yaw trim of minus 1.12.

04 07 28 32 CC
Hey, good job.

04 07 28 35 CMP
You guys are getting more of these every day.

04 07 28 38 CC
That's a good long one, there.

04 07 28 40 CMP
You must think we're going to stay up here forever.

04 07 28 47 CDR
Hey, speaking of staying up here forever, what time are you going to wake us up in the morning?
That's just what we're talking about here. We're just thinking maybe we'll let you know and we'll give you a call. You know.

Texas (Rev 66)

That sounds like a good idea.

Okay. That's all we'll do. We'll just let you sleep, and we'll give you a call - or you give us a call whenever you want to, if we don't call you.

(Laughter) How about 307 Alfa Charlie?

Okay. By that time for sure. And just out of curiosity here, seeming you all sound pretty chipper up there. How you doing?

We're pretty good. As a matter of fact, none of us had anything to eat all day long except for the breakfast we had which was like 30 hours ago, I think. We're all in pretty good shape.

I think Rusty and I had an advantage over Dave because the water in the HM tastes better than the water in the command module.

Roger. And I guess no medication is on the thing. We've got about 30 seconds here - 10 seconds LOS and if you can give us the consumables through Tananarive, fine; otherwise forget it.

End of tape
Apollo 9, Houston through Tananarive.

Apollo 9, Houston.

Houston, 9.

Roger, Dave. We showed a CMC restart between our last state vector update and the Redstone pass. Did you power it down and then back up?

Yes. We had it in STANDBY and we had our gimbal lock on which had our FGNCs on, and we decided to go back to power everything up so we could get the DMU coarse aligned out of gimbaled lock so we wouldn't have our lights on during the night. Did we bomb you?

Roger. But we're satisfied now with the restart then.

Okay. We didn't get our restart light, though.

Roger. It's normal. It just adds our counter down here when you power up.

Yes; that's right. You have our reading on. Okay.

On the H2 pressures, if it looks like it's going to trigger the MASTER ALARM, we'll wake you up for a manual REPRESS, and then you can go back to sleep. We don't expect it, though.

Apollo 9, Houston. Congratulations from the Gold Team; it was a very fine day. We'll see you in the morning.

Thank you very much, Gold Team. You guys did a very fine job, too.

Roger.

Somebody else wants to make a comment.

Hello, Houston.

Houston. Go.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 08 13 25</td>
<td>CC</td>
<td>Apollo 9, Houston. Go.</td>
</tr>
<tr>
<td>04 08 13 30</td>
<td>CDR</td>
<td>That was a great job you all did today.</td>
</tr>
<tr>
<td>04 08 13 34</td>
<td>CC</td>
<td>Thank you.</td>
</tr>
<tr>
<td>04 08 13 39</td>
<td>CDR</td>
<td>I thought the higher ground team was about as good as anything I've ever seen or ever hope to see. I want to congratulate you all.</td>
</tr>
<tr>
<td>04 08 13 48</td>
<td>CC</td>
<td>Roger. Thank you very much.</td>
</tr>
</tbody>
</table>

END OF TAPE
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND TRANSCRIPTION

04:14 11 31  CC  Apollo 9, Houston.
04:14 11 37  CMP  Houston, Apollo 9.
04:14 11 38  CC  Roger. Did you just waken up there, Dave?
04:14 11 42  CMP  Roger ... 
04:14 11 46  CC  Apollo 9, Houston. I understand you got - Looks like we're seeing a MASTER ALARM down here. You've got a condenser exhaust temperature low on fuel cell 2, and we've got some recommended switching for you.
04:14 11 59  CMP  Okay. I've been watching that. Go ahead.
04:14 12 02  CC  Okay, Dave. What we'd like you to do is put the CMC to OPERATE, and once you're in OPERATE, go to POO and turn inverter 3 - place inverter 3 on MAIN A.
04:14 12 16  CMP  Okay. Bring CMC up to POO and put inverter 3 on MAIN A.
04:14 12 20  CC  That's firm, Dave.
04:14 13 26  CC  Apollo 9, Houston.
04:14 13 34  CMP  Go.
04:14 13 35  CC  Roger. Apollo 9, Houston. While we've got you up, we're having a little trouble getting some down range. We'd like you to place the S-band at normal transponder, switch to OFF for 4 seconds, then to SECONDARY.
04:14 13 53  CMP  Roger. S-band normal transponder to OFF, then into SECONDARY.
04:14 13 59  CC  Roger.
04:14 14 39  CMP  Okay, Houston. We've got inverter 3 on MAIN A, and we're in POO.
04:14 14 44  CC  Roger. Apollo 9, Houston. Thank you very much.
04:14 14 48  CMP  Thank you.
(GOSS NET 1)

04 14 14 58  CMP  How's everything doing down there?
04 14 15 01  CC   Oh, pretty smooth down here except for watching condenser exhaust temperature vary a little bit on us. Sorry that you had to get awakened with the MASTER ALARM.
04 14 15 10  CMP  At least you're watching for us.
04 14 15 12  CC   We're watching you.
04 14 15 15  CMP  Okey-dokey.
04 14 16 58  CC   Apollo 9, Houston.
04 14 17 02  CMP  Roger. Go ahead.
04 14 17 04  CC   Roger. We're having some difficulty commanding downlink, and so we'd like you to go PCM bit rate to HIGH, and we'll just leave it that way for the rest of the night.
04 14 17 17  CMP  All right, Houston. HIGH.
04 14 17 24  CMP  ...
04 14 17 27  CC   Alrighty. Thank you, sir.
04 14 17 30  CMP  Roger.

END OF TAPE
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

CANARY (REV 74)

04 20 30 15 CC Apollo 9, Houston.
04 20 30 33 CC Apollo 9, Houston.
04 20 30 39 SC Houston, this is Apollo 9.
04 20 30 43 CC Good morning, Apollo 9.
04 20 30 50 CC Apollo 9, Houston. You're getting a little low on the H_2 cryo tanks pressure. We'd like you to turn the H_2 number 2 fan on, and the configuration for H_2 tank 1 would be fans OFF, and 1 and 2 heaters OFF.
04 20 31 11 CMP ... I missed the first part of that. Would you start over again, please?
04 20 31 15 CC Roger. Dave, turn the H_2 tank 2 fan on and leave the H_2 tank 1 fan off and the 1 and 2 heaters off.
04 20 31 28 CMP Okay. H_2 fan 2 is ON; 1 is OFF; both heaters for H_2 are OFF.
04 20 31 39 CC Roger.
04 20 31 41 CMP And my tank ...
04 20 33 03 CMP Houston, Apollo 9.
04 20 33 05 CC Apollo 9, Houston. Co.
04 20 33 07 CMP What do you want to do about our switch configuration when we get powered up? Do you want to go back to sort of nominal switch configuration, or do you want to leave that inverter on and the S-band in SECONDARY?
04 20 33 19 CC Apollo 9, Houston. Stand by. We'll get a reading on that for you.
04 20 33 22 CMP Okay. Thank you.
04 20 33 45 CC Apollo 9, Houston.
04 20 33 47 CC Go ahead, Houston.
04 20 33 48  CC  Roger. You can leave the S-band in SECONDARY for now and go ahead and turn the inverter off.

04 20 33 54  CMP  Okay. I'll leave the S-band in SECONDARY, and the inverter's coming off.

04 20 33 57  CC  Roger.

04 20 36 57  CC  Apollo 9, Houston.

04 20 37 00  CMP  Go ahead.

04 20 37 01  CC  Roger, Dave. I've only got a minute left here at Canaries. We'll start today for you at Carnarvon with the updates and the plan for the day.

04 20 37 11  CMP  Okay. What time will that be? How long from now?

04 20 37 13  CC  Roger. That will be about a half hour, 17 05.

04 20 37 17  CMP  All right. Thank you. You're all set.

04 20 37 19  CC  Roger. See you then.

04 20 37 20  CMP  Okay.

MADRID (REV 74)

04 20 39 07  CMP  Houston, Apollo 9.

04 20 39 11  CC  Apollo 9, Houston. Go.

04 20 39 18  CC  Apollo 9, Houston ...

04 20 39 25  CMP  Houston, Apollo 9.

04 20 39 28  CC  Apollo 9, Houston.

CARNARVON (REV 74)

04 21 07 12  CC  Apollo 9, Houston.

04 21 07 25  LMP  Go, Houston. This is Apollo 9.

04 21 07 28  CC  Roger, Apollo 9. If you've got a pencil ready, we will start on the update.
04 21 07 35  IMP  Roger. How do you read me?
04 21 07 38  CC  I'm reading you loud and clear, Dave.
04 21 07 41  CDR  Okay. That's Rusty. And good morning there, Sonny.
04 21 07 44  CC  Good morning, Jimmy. You ready to copy some updates?
04 21 07 49  CDR  All set.
04 21 07 50  CC  Okay, we'll give you the flight plan updates first. At 117 55, begin BATT A charge. That's BATT Alfa charge; 118 00, CO₂ filter change number 10; fuel cell O₂ purge. At approximately 119 30, after breakfast, chlorinate potable water.
04 21 08 57  CC  Delete 113 118 40, P51.
04 21 09 13  CMP  You want to delete that P51 at 118 40?
04 21 09 18  CC  That is affirmative. At 120 02, P51 and P52 to preferred.
04 21 09 37  CMP  Okay.
04 21 09 38  CC  121 40 end BATT Alfa charge. SPS-6, TIG is 121 48 58. 122 00 begin BATT A charge. Delete 128 30, S065; add landmark tracking. Perform P52, that's P52, to nominal alignment at 124 35. Time of align to be updated. Add 128 50, waste water dump. Note: first S065 exercise remains as scheduled and -
04 21 11 14  CMP  Wait.
04 21 11 15  CC  Roger. Go ahead.
04 21 11 23  CC  Note number 2: the landmark tracking is for practice and will be only one landmark. And before we get to Honeysuckle, you can turn up your S-band volume.
04 21 11 49  CMP  Okay, Sonny. I'll read most of that back to you now. I've got a 117 55 begin BATT A charge. 118 00 CO₂ filter change number 10 and fuel cell number O₂
purge. At about 119 30, after breakfast, chlori-
icate the potable H2O. There was something at
118 40 that I missed. How about giving me that
one?

Roger. At 118 40, delete P51.

Okay. And I've got perform P51 and P52 at 120 50.

That's perform P51 and P52 at 120 02.

Okay. P51 and P52 to performed at 120 02. End
the BATT A charge at 120 40. At 121 40 36, SPS-9
TIG. At 122 00 resume BATT A charging. 125 00
delete 5065; in its place add landmark tracking
with tracking on one landmark for drill, and P52
to a nominal alignment; then you are going to
update the T-align. And that will be done at
about 124 30; and at 128 50, a waste water dump.

Roger. That's correct, Apollo 9. And you con-
turn up your S-band now. We're coming up on
Honeysuckle.

Roger.

And, Apollo 9, Houston. Just to warn you. We've
had a little trouble with S-band. We might not
pick you up here.

HONEYSUCKLE (REV 74)

Apollo 9, Houston through Honeysuckle.

Apollo 9, Houston.

Apollo 9, Houston.

Hello, Houston. Apollo 9.

Roger. There you are.

I have a question on SO65 on this update.

Roger. Go ahead.

Okay. You still want us to do the SO65 that we
unstow for and we are supposed to do at 124 00.
Is that correct?
And you want us to delete the one at 125 30?

Apollo 9. Let me get the words on that, and I will call you back.

Okay.

Let me give you the consumables update in the meantime.

You ready to copy?

Ready to copy.

Okay. At 117: 47 20 55 26 49 27 50 27 402 3233 2939. And I'd like to give you the service module DAP redline: quad A, 36; quad B, 47; quad C, 49; quad D, 49. Over.

Okay. We got 117: 47 20 55 26 49 27 50 27 402 3233 2939. Service module DAP redline: A, 36; B, 47; C, 49; D, 49.

Roger. Apollo 9, Houston. Copy. That's correct.

Bankers' hours today, right?

Oh, we watched you while you were sleeping.

How did we look?

You're looking pretty good.

Hey, we finally got to bed last night at 107 hours and something. I figure we had a nice 26-hour day yesterday.

You had nice 10-hour night, too.

Yes. That was a lot of fun, too.

Sorry we had to wake you up. Incidentally, on that E2 tank - There are no plans today to do anything about the tank. We are just going to watch it.

Okay. That's tank number 1, the low one?

Roger. Tank number 1.
Roger. Houston, you might concern on the status of the high bit rate, too. Whether you want it to stay in HIGH, or if you want to try to switch it again, or what.

Roger. When you get over the States, we've got a troubleshooting routine here we want go through to see if we can figure out what the problem is, but we won't tackle that until we get to the States.

Okay.

Okay. Are you ready for a block update number 13?

Give me about 2 seconds here.

All right.

Okay. Go ahead.

Roger. Block update number 13. We probably won't be able to get all of it. We will go as far as we can. 075 1 Alfa, plus 290, minus 066 117 36 4092; 076 2 Bravo, plus 307, minus 033 149 17 43 4092; 077 2 Bravo, plus 227, minus 032 129 52 15 4092; 076 1 Alfa, plus 260, minus 069 129 17 41 4092; 079 - Roger. Okay.

MERCURY (REV 76)

Houston, Apollo 9. We have a good lock on that. How do you read?

Apollo 9, Houston. Loud and clear.

Okay. First --

Go ahead.

Start with a longitude, the third line in 076 2 Bravo.

Roger. We'll start out with longitude in block 076 2 Bravo. That's minus 039 119 17 43 4092; 077 2 Bravo, plus 227, minus 032 129 52 15 4092; 078 1 Alfa, plus 280, minus 069 129 17 41 4092; 079 4 Alfa, plus 318, minus 170 129 28 31 43; 080 4 Bravo, plus 337, minus 170 129 26 09 3344;
081 4 Alfa, plus 310, minus 1705 128 09 44 33½3; 082 Delta Charlie, plus 179, minus 1600 129 46 43 33½3. The SPS gimbal trim for REV 75 1 Alfa through 78 1 Alfa: pitch, minus 069; yaw, minus 112. For REV 79 4 Alfa through 82 Delta Charlie, trim angles are pitch, minus 069; and yaw, minus 115. Over.

Roger. Just - You ready to read back, Al?

Okay, Apollo 9. Go ahead.

Okay. I'll read it back pretty fast here. 075 1 Alfa, plus 290, minus 0692 117 36 36 4002; 076 2 Bravo, plus 307, minus 0330 119 17 43 1092; 077 2 Bravo, plus 227, minus 0329 120 52 15 4092; 078 1 Alfa, plus 280, minus 0690 122 17 41 4002; 079 4 Alfa, plus 318, minus 1705 125 02 33 33½3; 080 4 Bravo, plus 337, minus 1705 126 36 09 33½3. Turn the page, and then it's 081 4 Alfa, plus 310, minus 1705 128 09 44 33½3; 082 Delta Charlie, plus 179, minus 1600 129 46 43 33½3. SPS trim for 75 and 78: pitch, minus 0.89; yaw, minus 1.12. REV 75 through 82: pitch, minus 0.89; minus 1.15.

Roger. Apollo 9, Houston. Copy correct, and the answer to your question on S065 at 124 is yes. Perform the S065 at 124. It's just deleted at 125 30, and we have a question for you. Did you leave the selectable meter in position battery bus A overnight?

Stand by.

Okay. The answer is probably yes.

Roger. Understand the answer is yes.

TENSA (REV 74)

Apollo 9, Houston.

Roger. Houston, Apollo 9.

Roger, Apollo 9. Got a couple things here for you, prior to SPS-6.

Okay. Go.
Okay. Before SPS-6, turn quad C and D off or AUTO RCS selects in adapt - and in the DAP - I'm sorry. Use BD - Baker, Delta - two-jet ullage for SPS-6 for 18 seconds. Use BD roll for SPS-6 and subsequent activities. Post-SPS-6, you may return to normal two-jet authority.

And, Apollo 9, Houston. When you get a chance, we'd like to get the condition on the windows. And prior to SQ65 we'd like you to try and get a picture of the hatch window. Over.

Okay. Hold it Al, that was a lunch. Let me get the first part of that again. For SPS-6 you want us to disable A and C, quads A and C and also F and G in the DAP. And you want us to use B and D ullage for 18 seconds, two jets, and B and D roll for SPS-6 and subsequent roll control. Post-SPS-6 you want us to return to normal two-jet authority.

Roger, Apollo 9. The last three items were correct. The first one, for your pre-SPS-6 activities, turn quads Charlie and Delta off on the AUTO RCS select and in the DAP. That's pre-SPS-6.

Okay. Understand. Pre-SPS-6 you want us to turn Charlie and Delta off on the AUTO RCS select and also in the DAP.

That's affirmative, Apollo 9.

Okay. And understand you want to know what the windows look like, and also you want a picture of the hatch window prior to performing SQ65.

Apollo 9, Houston. That's correct.

Okay. This is kind of a subject of evaluation, but it seems to re that all the windows are really pretty good when you're looking at the ground or anything that is lighted. If you look at the sky, you can see some smudger on some of the windows, the number two window.

Stand by just a moment.

Roger.

Okay. When you look up at the sky, I get sunlight on the number two window. It's kind of hazy or foggy, but when you are looking at the ground, it appears...
okay. So it's a fairly light coating. Also, on the hatch window, from time to time, there appears to be a circular area right in the middle of it about 4 or 5 inches in diameter that appears to be foggy. But again, looking at the ground through it, it doesn't seem to be too noticeable.

Roger. Understand.

Houston, Apollo 9.

Apollo 9, Houston. Go.

Okay. One question on the DAP configuration after SPS-6. You want to go to two quads?

Apollo 9, Houston. You can go back to normal - two-jet authority - after SPS-6.

Okay. I guess I understand. You want to use six jets for attitude control total, and when we run the DAP, I guess we use two adjacent quads, is that what you want?

Affirmative, Apollo 9.

Okay. Thank you.

END OF TAPE
Apollo 9, Houston.

Go ahead, Houston.

Roger. We would like to continue on with some troubleshooting on the telemetry command. We would like you to place the up-telemetry data to UP-VOICE BACKUP.

Roger. Going to UP-VOICE BACKUP.

Roger. And we may have to use VHF for COM, and we will send you a command tone.

Be advised I have a tone right now, Houston.

Houston, Apollo 9.

Roger. Apollo 9, Houston. We just sent you a command.

Roger. From the time I went to UP-VOICE BACKUP, I had a steady tone at that time, and it's still the same.

Roger. We'll send you another command.

Apollo 9, Houston. You should get some variations on that steady tone you were hearing when the command is sent.

Roger. I've got my S-band up louder now. Go ahead and send another command.

Roger. We're sending another command. On my Mark.

MARK.

MARK.

Okay. I got a very slight beep on it.

Roger. We sent you three commands.

Apollo 9, Houston. We sent you three commands. Could you distinguish variation in your tone on three occasions?

Negative. How do you read, Al?
I'm reading you loud and clear, Rusty.

04 21 58 14 LMP Okay. I was commenting there and didn't hear any response. When you said 3, 2, 1, Mark - About 3 seconds after that, I got a slight interruption in the steady tone. That happened only one time. When you came back on and told me that you sent three commands, in the middle of telling me that, I got another interruption in the tone. And that's all I've heard.

04 21 58 42 CC Roger, Rusty. We'll send you one more command on my Mark. 3, 2, 1.

04 21 58 50 CC MARK.

04 21 58 55 LMP Nothing.

04 21 58 57 CC Roger. Understand; nothing.

04 21 59 03 CC Apollo 9, Houston. We will digest that a little bit and call you back.

04 21 59 09 LMP Okay.

04 21 59 24 LMP Houston, I just got another little beep in it.

04 21 59 29 CC Roger. Apollo 9, Houston. Understand.

04 21 59 36 CC Apollo 9, Houston.

04 21 59 38 LMP Go ahead.

04 21 59 39 CC Roger. We would like you to verify the following: flight and postlanding BATT bus A OPEN.

04 21 59 53 LMP Flight and postlanding BATT bus A -

04 22 00 09 LMP Roger. It's OPEN now. Thank you.

04 22 00 12 CC Roger. And on panel B, we would like for you to verify: SPS pitch 1, yaw 1, OPEN; and EDS, all three OPEN.

04 22 00 40 LMP' Okay. The two SPS's were CLOSED; we opened them. The EDS's were all OPEN.

04 22 00 46 CC Roger, Rusty. Understand. And was the flight and postlanding BATT bus A OPEN when you called? Had it been OPEN before then?

04 22 00 55 CDR Negative. It was CLOSED.
Roger. Understand CLOSED.

Houston, we've got a question on the fuel cell purge.

Roger, Apollo 9. Go.

Roger. Yesterday, when fuel cell 3 – rather fuel cell 2 had the high TCE - After we purged it, it dropped way down in performance, and it's still below 1 and 3. We would like to verify that you really want to purge that. We are concerned that it may drop it off the bottom of TCE.

Roger, Apollo 9. Stand by. We will get an answer on that.

Okay.

Apollo 9, Houston.

Roger. Go ahead.

Roger. Apollo 9, Houston. While we've got a minute here, we would like to get a crew status report from you.

If you are ready, the first question is regarding any illness. How are you feeling now? And what to know what medication you took yesterday and today on all three, and especially what you took yesterday morning, Rusty.

Okay. Everybody is feeling fine, and stand by on the medication.

Roger.

Hello, Al. This is Jim.

Roger, Jim.

Roger. I didn't take anything yesterday or today. I've got some information for INTRO. They wanted to know last night where we were going to show some things. I've worked out a plan here, if you are ready to copy it down.
Roger. Go.

Okay. We are going to have one suit underneath the left-hand seat, have two suits underneath the center seat. We are going to take the compartment B-1 - We are going to move all the food out of that and use it as a garbage bin, so the density will be much less than it was before. We are going to take the LCG's, the ones that Rusty had been wearing, and fasten them to the floor in the lower equipment bay on top of the lithium hydroxide canisters. We will take the lithium hydroxide canister that we've brought back from the LM and put it on the floor in the lower equipment bay up underneath the suit. And the rest of the stowage will remain essentially the same.

Roger, Jim. Copy. You are going to put one suit under the left-hand seat; you are going to put two suits under the center seat; you are going to take the food out of B-1 and use it as a garbage bin; you are going to stow one LCG on the floor in the LEB around the lithium hydroxide canisters; you are going to stow the lithium hydroxide canister you brought back from the LM on the floor under the suit; and the rest remains the same.

Roger. We will probably make some other changes, but have them base the weights and CG on that for a while.

Roger. We got that.

Okay. Okay, Al. This is Rusty again. Yesterday morning I didn't take anything. Last night before I went to bed I took an Actifed and a Seconal.

Roger, Rusty. Understand you. Last night - You didn't take anything yesterday morning, and last night you took one Actifed and one Seconal.

That's affirmative. And Dave didn't take anything at all yesterday.

Roger. Okay. Ready for the next question: how much sleep did you all get last night?
Dave said he got about eight; I got about eight.

Okay. And Rusty - I got eight, also.

Roger. Copy. You all got 8 hours.

Okay. We'd like you to do some troubleshooting on the BIOMED harness. We would like each of you to check your sensors. Dave, we didn't get any ECG on you last night. We'd like you to check your sterile sensor in the grounds for a loose sensor, and, if the sensors are secure, to replace the external leads and sensor with a spare.

Okay. We'll do some troubleshooting on the sensors. Dave had his sensors all plugged in last night. I guess you still weren't getting anything. Is that right?

That's affirmative, Jim. And we'd like you -We've got no respiration on you. We'd like to check your axillary sensors.

Okay. I'll check those, and right now neither Dave or I are plugged into the BIOMED. I don't know about you.

Yes, I'm plugged in. How do mine look? Do you want any troubleshooting on mine, Al?

Okay. Stand by one, Rusty.

And Dave and I will get plugged in as soon as we get through doing some chores here.

Roger, Rusty. We're not getting anything on you.

Okay. Be advised I can give you a little bit of information on mine right now. I've had to take mine off four or five times here due to getting into the two ECG's and back into the constant-wear garment and things like that. But I've noticed that the yellow signal conditioner connector does not seem to go all the way in any more. I'll look at it and see if I can do anything with it, but it may be that.

Roger, Rusty. Understand. And would you switch the up-telemetry data switch to DATA now, please?
LMP  04 22 11 46  Roger. Up-telemetry back to DATA.

CDR  04 22 11 49  Al, Dave went through all his BIOMED harness
               last night. He unscrewed it and screwed it back
               in, pushed down on all the sensors, checked the
               connections, and everything looked all right.
               Is there anything else you wanted done?

CC   04 22 12 07  Let us think about it for a little, Jim, and we'll
               give you a call back. We weren't reading anything
               on him last night.

CDR  04 22 12 14  Okay.

CARNAVON (REV 75)

CC   04 22 40 51  Apollo 9, this is Houston through Carnarvon.
               Standing by.

LMP  04 22 40 56  Good morning, Smokey. How are you?

CC   04 22 40 58  Oh, good morning, fearless leader. I'm just
               fine.

LMP  04 22 41 03  Oh, no. This is fearless number 3.

CC   04 22 41 05  Oh, okay. Hey there, Rusty. Sound awful chipper.

LMP  04 22 41 11  Yes. It's middle of breakfast time here. It's
               tasting good.

LMP  04 22 41 22  Hey, Smokey. How about asking Sir John how
               my BIOMED service went out?

CC   04 22 41 30  Okay. Stand by one, Rusty.

CC   04 22 41 42  It's still not coming through at all, Rusty.
               We're not getting any BIOMED's from anybody.

CC   04 22 41 54  But stand by on any troubleshooting you have
               up there. Let us work our side out here. We
               might have a ground problem.

LMP  04 22 42 05  Okay.

CC   04 22 45 02  Hey, Rusty. Houston here. I realize you are
               at breakfast there, but if - Could you move a
               couple of switches for us? We are still trying
               to troubleshoot this comm system.
Sure can. Go ahead.
Okay. We'd like to have the up-telemetry command switch to RESET, then OFF, and then NORMAL.
Okay. Up-telemetry command going to RESET. 3, 2, 1.
MARK.
Okay. And back to OFF, and now back to NORMAL.
Okay. We are in NORMAL.
Okay. Understand. Thank you. And we might have a couple more here.
Okay. We're with you.

Apollo 9, Houston through Honeysuckle. How do you read?
Apollo 9, Houston through Honeysuckle. How do you read?
Oh, you're coming in five-square there, Snokey.
Okay, dusty. Looks like we have got our command system back again, and we are going to be transmitting an abort command, so you should see the light here. And it'll be on for about a minute.
Okay. What should we see?
You should see the abort light.
Okay. Stand by.
Okay. We got our eye on it.
Okay.
MARK.
You should have the light.

MARK.

We don't.

Okay. We'll try again.

How now?

Still the same. I wonder if we may have to get some circuit breakers or something closed for you?

That's a negative, Rusty. We should be getting in.

Okay. We don't need the EDG power ON?

Stand by.

Did you get it then, Rusty?

That's a negative.

Okay. Apollo 9. We're still troubleshooting on that one. You all made all the headlines on that rendezvous; it was mighty pretty. I see here that they are cooking you a 350-pound cake aboard the Guadalcanal that you'll have to eat when you get down there.

Listen; we're ready, man - We're ready. With the amount of time we've had to eat in the last few days, we are going to eat it.

Roger.

Hey, Stu. I don't know if you guys got my message yesterday because we were scrambled and getting ready for the APS burn, but I would like to thank you all for the tremendous job that you did. All that practice that we did in these simulations really paid off, and I think that, as I said yesterday, we've got the world's greatest set of controllers.

Thank you, Jim. That makes us all feel real good, and the whole control center here appreciates that.
Yes. And that's what it goes for. It goes for all those guys down there in the pit, up there in the balcony, even the guys in the viewing room and running the computers and all those kind of things. I want to include them all.

Roger.

That goes for all of us, too, Smokey. We all agree.

Roger. I tell you, you all really put on a show for us. That was fantastic.

Hey, I don't know if you had a chance to plot it out, but I don't think we got more than a pencil-width off the nominal line the whole time we were on.

No - it - You were right on all the way around, and it was phenomenal the way all three solutions were coming together. It was beautiful.

Wasn't that something.

Might give you the impression that it might work.

Yes. (Laughter) It sure does.

Hey. And, Apollo 9 - Jim, when you and - Just stand by.

And when Dave plugs in the BIOMED, why we'd appreciate a call, just so we'll be sure we're getting the data. We're about 30 seconds LOS off Honeysuckle here. We'll see you over Mercury about on the hour.

And, Apollo 9, if you can still read me, we would like to have you look in your logs, and we're going to be asking you for the time of your last two fuel cell purges.

Apollo 9, this is Houston through Mercury. We will have you for about 5 minutes. And we're looking at the fuel cell here, Apollo 9. We would like, if possible, to get the time of the last two fuel cell purges, if you could give us that time.
04 23 01 19  CDR  Stand by.
04 23 01 21  CC  Roger.
04 23 02 05  CMP  Houston, Apollo 9.
04 23 02 09  CC  Good morning, Dave. Go ahead.
04 23 02 11  CMP  Roger. How are you?
04 23 02 13  CC  Real fine.
04 23 02 15  CMP  We purged yesterday at approximately 8 hours when we started the day. And then last night we purged at about - just about what it says on the flight plan, at 102 - probably 102 50. And we did all three fuel cells' O2 for 2 minutes.
04 23 02 39  CC  Roger. Copy. Thank you very much. That will help us out here.
04 23 02 44  CMP  Okay. And I wasn't on the horn there on your last pass, but I would also like to express my appreciation to all you guys for doing an outstanding job. I tell you, it's sure nice when you are driving this thing around alone to know you guys are on the horn watching.
04 23 02 59  CC  Thank you, Dave. We all appreciate that. And just to prove that I can follow instructions here, I've got a ball score. The Astros lost to the Los Angeles Dodgers 8 to 1 in the spring exhibition opener at Cocoa Beach.
04 23 03 22  CMP  Hey, we're holding true to form.
04 23 03 24  CC  Roger.
04 23 03 30  LMP  Hey, is the University of Houston still playing basketball?
04 23 03 39  CC  Roger. Chris wanted to pass on to you that Virginia Tech beat them in their last game.
04 23 03 48  LMP  Oh, you're kidding. I don't believe it.
04 23 03 55  LMP  If that's true, I'm going to have to go have a talk with a couple of people...
04 23 04 00  CC  (Laughter) Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>Actor</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 23 04 02</td>
<td>CDR</td>
<td>Hey, since we didn't get to launch on the right day, is Chris there?</td>
</tr>
<tr>
<td>04 23 04 07</td>
<td>CC</td>
<td>That is affirmative.</td>
</tr>
<tr>
<td>04 23 04 09</td>
<td>CDR</td>
<td>Okay. We've got a message for him.</td>
</tr>
<tr>
<td>04 23 04 11</td>
<td>CC</td>
<td>Okay. He is on the loop.</td>
</tr>
<tr>
<td>04 23 04 15</td>
<td>CDR</td>
<td>Okay. Happy birthday to you, happy birthday to you, happy birthday dear Christopher, happy birthday to you. (Sung to the tune of &quot;Happy Birthday.&quot;)</td>
</tr>
<tr>
<td>04 23 04 35</td>
<td>CC</td>
<td>That was magnificent, there. The only thing - you may even overshadow the rendezvous with performances like that.</td>
</tr>
<tr>
<td>04 23 04 45</td>
<td>LMP</td>
<td>Listen, we have two more choruses of that. Is Deke there?</td>
</tr>
<tr>
<td>04 23 04 49</td>
<td>CC</td>
<td>That's negative.</td>
</tr>
<tr>
<td>04 23 04 51</td>
<td>CDR</td>
<td>Okay. When he comes in, let us know. I want to give him one, too. And, also, when Charlotte shows up, if she ever does.</td>
</tr>
<tr>
<td>04 23 04 57</td>
<td>CC</td>
<td>All right. Fine. We will let you know.</td>
</tr>
<tr>
<td>04 23 05 48</td>
<td>CC</td>
<td>And, Apollo 9, Houston. We will be coming off the Mercury in about 30 seconds. We will see you over Redstone about 14.</td>
</tr>
<tr>
<td>04 23 06 01</td>
<td>CKP</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 23 06 07</td>
<td>CC</td>
<td>And, Dave, when you plug in your BIOMED, we would like a call, just to make sure our system is working.</td>
</tr>
<tr>
<td>04 23 06 13</td>
<td>CKP</td>
<td>Okay. I'll do it right now.</td>
</tr>
<tr>
<td>04 23 06 15</td>
<td>CC</td>
<td>Okay. Thank you.</td>
</tr>
<tr>
<td>04 23 06 18</td>
<td>CDR</td>
<td>Houston. Are you getting my respiration now? This is Jim.</td>
</tr>
<tr>
<td>04 23 06 22</td>
<td>CC</td>
<td>That's affirmative, Jim. The last word I have here, you were coming through.</td>
</tr>
<tr>
<td>04 23 06 28</td>
<td>CDR</td>
<td>Okay. I haven't done anything to it as far as the BIOMED sensors themselves. All I've done is plug and unplug the COMM lead a few times when I changed configuration.</td>
</tr>
</tbody>
</table>
Okay, Jim. I was in error. We are getting your EKG; we are not getting your respiration.

REDSTONE (REV 75)

Apollo 9, Houston through the Redstone. Standing by.

How about a map update?

Roger, Apollo 9. In work.

Today, we are going to have time to look out, and man, I'm going to look out.

Okay. And to the question back on the fuel cells: we've looked at our performance plot versus the time of the purges and so forth, and we saw no change in the performance - no drop - and we are recommending a purge on all three fuel cells.

Okay. Very good. We'll purge all three.

And we're saying that the load sharing went down because of the high temperature on the condenser exhaust there, and not the purge.

Okay.

And, Apollo 9, I have your map update.

Roger. Go ahead.

Okay. REV 75 is GET 119 10 01, right ascension 1642, longitude 143 27 west.

GUAYMAS (REV 75)

And, Apollo 9, Houston. We got you through Guaymas, now. Did you get your map update through the Redstone, Jim?

Roger. It was REV 75, GET 119 10 01, 1642 right ascension, 143 27 west.

That is affirmative.

Roger. Thank you.
Roger.

And, Houston. You getting any BIOMED on the CMP now?

Dave, we're getting the respiration, no EKG. On Jim, we're getting EKG and no respiration, and Rusty's coming through on both of them. The only thing that we could suggest was if whenever you have the time, try the spare sensors there. Take and - Dave, replace his sternal lead to the blue ones; and Jim, replace his yellow leads from the spare some time when you get around to it.

Okay. We'll try and do that.

Okay.

We'll let Dave breathe, and we'll let my heart beat.

All right. (Laughter) Very good.

And, Apollo 9, this is Houston. We would like to have you go POO in ACCEPT. We'll be uplinking to you through MILA here in about a minute and a half or so.

Okay. We'll POO in ACCEPT.

Roger.

And you should just about be on landfall coming across now.

Roger. We just passed over it. ... We're - Stand by. We'll find out.
Apollo 9, Houston. I have SPS-6 PAD when you are ready to copy.

Roger. Stand by one.

Standing by.

Okay, Houston. Go ahead.

Roger. Reading SPS-6: 121 45 5760, minus 00369 all zips, minus 00 204 0142 00273 0016 27016, minus 089, minus 113 12 35440 23600, and I'm going to have to give you a time on your NAV check here since TIC is so far ahead. The time of this NAV check: 120 30 00, minus 1918, plus 16492 1203. End of update.

Okay. Six readback: 121 45 5760, minus 00369 all zips, minus 00204 01422 00273 0016 27016, minus 089, minus 113 12 35440 23600. The time of the NAV check: 120 30 00, minus 1918, plus 16492 1203.

Roger. Apollo 9, your readback is correct.

And, Apollo 9, the computer is yours. We have uplinked the state vector and a target load.

Roger. State vector and target load.

Apollo 9, Houston. We're about 30 seconds from LOS Canary. We'll see you over Tananarive at around 59. You have a GO for 93 dash 1.

Roger. GO for 93 dash 1.

Tananarive (REV 76)

Apollo 9, Houston. We should have you through Tananarive for about another 5 minutes.

Okay, Houston. Apollo 9 reads.

Boy, I'm reading you loud and clear.

Houston, this is Apollo 9.
Go, Apollo 9. This is Houston.

Houston, we are having a little optics problem again. It seems that the shaft is hanging up, and now it's hanging up around at about 100°. It will come closer to about 230 degrees. We are still going through a little troubleshooting here, trying to figure out how to get it out. Yesterday it worked just fine all day long, and I'm not sure whether it's -- We're trying to fix it. We had one little ... early in the morning, and then it seemed to work fine the rest of the day, and I'm not sure whether it's an extra morning problem or just exactly what.

Roger. Apollo 9, Houston. We copy that. We are not getting any data here. Maybe over Carnarvon we can have some words on it, and we'll go to work on it.

You might start thinking about some changes in the flight plan here; we may not be able to get this one working here.

Roger. Understand.

So we won't be able to ... SPS-6 on time.

Roger. Copy.

Houston, Apollo 9.

Go, Apollo 9, Houston.

Okay. I've got it running again by breaking the shaft loose -- not breaking it, but loosening the mechanical drive on the shaft, and driving it with the F-2 mechanically across the sticky part and then, with power off, turning the optics power back on and turning it through and turning it back to zero. So I think anyway, temporarily at least, we're out of the problem.

Roger, Apollo 9. Understand. Sounds like you're doing some good troubleshooting there. I'm about to lose Tennessee. Carnarvon at 15.

And, Apollo 9, Houston. If I still have you, one other thing we'd like to have is, from now on out, we'd like the time of each fuel cell purge whenever you do the purges.
Apollo 9, Houston through Carnarvon. Standing by. Have you about 5 minutes.

Okay.

As you can see, we're working on 52 now. We had the optics hang up a couple more times here.

Understand.

Go.

Apollo 9, Houston. On the fuel cell purges, we would like to know the time of the purges from now on and also we would like to have your opinion of how today's purge went, what effect it had, and how did it compare with yesterday?

Okay, Houston. We purged 2 minutes just after you gave us the word that you thought the purge was a good thing to do. I checked them a few minutes ago and the fuel cells all looked very well balanced. I'm checking them right now, and they are very well balanced. Stand by one; let me look at the fuel cell performances.

Okay. The TCE is up a little bit again on fuel cell 2. It's not off the top yet, but it is higher than fuel cell 1 and 3 and it's drawing about the same load.

Roger, Apollo 9. Understand.

And we thank you for that info.

Roger.

And just for your info, it will be sunrise in about 19 minutes.

Okay. Thank you.

And, Apollo 9, Houston. We'll be picking up Honeysuckle in about 2 minutes; put your S-band volume up, please.

Okay.
05 00 22 06   CC  And, Apollo 9, Houston. I copy your DS.
05 00 23 04   CMP  Houston, Apollo 9.
05 00 23 06   CC  Go, Apollo 9.
05 00 23 10   CC  Apollo 9, this is Houston. I'm reading you loud
and clear.
05 00 23 15   CMP  Okay. Did you get the gyro torqueing?
05 00 23 19   CC  That is affirmative, Dave. I copied plus 119,
minus 1277, plus 503. We had a data dropout; I'm not sure I got the
time.
05 00 23 31   CMP  Okay. Those are the right numbers at 120 23 00.
05 00 23 37   CC  LOS in about 20 seconds. Thank you for the time.
05 00 23 40   CMP  Roger. Thank you.
05 00 24 12   CC  Okay, Dave. When you get the chance with it
fresh in your mind, we would like to have you run through the trouble
that you are having. It appears to us that it's sticking in more than
one place.
06 00 24 25   CMP  Yes; that's right. Let me run back through it,
the history of the thing. I guess I told you
the other day, the T pack is hung up in 64
point, and the tenths roller goes all the way
around. It rolls all the time, and I can't
the move the T pack on the manual readout out
of 64 manually or electrically. And it seems to
hang up almost on multiples of 64, plus and minus
64, and around the 180 side, also. And when it hangs
up, you can't move the shaft in any mode coupling
speed at all. So what I've been doing is running
the optics off and breaking out the T pack with
the manual dial - the manual crank there to where
it looks like it's loose, at least a tenth slower
and then turn the optics back on and go into zero.
And that will zero it up, and then it seems to work
for a little while until I get to that plus or
minus 64 area, and then it all seems to hang up,
and nothing will bring it out, not even the AUTO
drive, today.
Okay, Dave. That's a real good rundown. We appreciate that and I'm going to lose you here at Honeysuckle probably in about a minute, and Huntsville at 30.

05 00 25 54 CMP Roger. Understand.

05 00 25 56 CC And we sure appreciate those comments.

05 00 25 57 CMP Okay. I'd appreciate those smart optics guys coming up with an answer.

05 00 26 03 CC Roger. We will give it a bloody go.

05 00 26 06 CMP Maybe we need to oil it.

05 00 26 13 CC Dave, is it just the telescope? Have you noticed any trouble with the sextant?

05 00 26 19 CMP It's - Well, to tell you the truth, I think the sextant hangs up too. I couldn't be certain because I only notice it in the telescope and I haven't been able to get a star into the sextant with a stuck telescope to look through the sextant, but I'll check it next time.

05 00 26 36 CC Okay, thank you. That's a pretty pertinent question. We would like to have the info.

05 00 26 41 CMP Okay. It's not stuck now, so I think I will stick to it to find out.

05 00 26 46 CC Okay.

HUNTSVILLE (REV 76)

05 00 35 13 CC And, Apollo 9, Houston through Huntsville. We'd like to have PC! bit rate LOW. We've got our command troubles, also.

05 00 35 22 CMP Okay. We're LOW.

05 00 35 25 CC Okay. Understand. We'll see you over Hawaii at 43.

05 00 35 42 CMP Roger. While you are waiting I'm trying the sextant and it seems to work fine in all modes - hand feed, MANUAL, AUTO, ZERO, and in any combination thereof, only the telescope gets hung up.
05 00 35 44 CC Roger. Understand. Copy, Dave; thank you very much.

05 00 35 51 CMP Roger.

HAWAII (REV 76)

05 00 42 08 CC And, Apollo 9, Houston through Hawaii. Standing by.

05 00 42 13 CDR Go ahead, Houston. You're a little broken again.

05 00 42 16 CC Roger. You're coming in okay, Apollo 9. We're on a low elevation here and we'll have continuous coverage on across the States, now.

05 00 42 26 LMP Oh, very good.

05 00 42 35 CDR Houston, Apollo 9. By the way, we did get a good alignment for the burn.

05 00 42 40 CC Roger. Copy. Understand.

REDSTONE (REV 76)

05 00 47 05 CC Apollo 9, Houston. We'd like to have H₂ tank 2 fan OFF, please.

05 00 47 12 CDR Roger, H₂ tank 2 fan OFF.

05 00 47 17 CC Thank you.

05 00 48 02 CDR Houston, are you still there?

05 00 48 06 CC Roger, Apollo 9. We're still here. We got good solid lock on you now. Go ahead.

05 00 48 12 CDR We have really been having some peculiar spacecraft rates. You know, when we go to bed at night, we try to damp the rates down to near zero so we don't have a lot - Running the clock will spin us up during the night. And every morning we get up and the rates are down around a tenth of a degree per second or something like that. Here in the last hour or so we've been trying to do this alignment and the rates keep building up. And I just - When
Dave finished I let them build up and they went up to about two tenths of a degree per second in pitch, and now that we're going along here without any jet firings, they've gradually dropped back down to they're almost zero. It looks like we're trying to stabilize the spacecraft at a certain fixed position which right now happens to be command module down towards the Earth.

Roger, Apollo 9. Copy. That's very interesting, thank you. We'll ponder that a while.

Okay.

Could you explain to me when I get down on the ground just exactly how you ponder?

Yes, sir; I'll do that.

It sounds like so much fun I don't want to miss it.

Yes, copy that. Sounds like y'all are having a ball up there. Wish I could swap.

Yes, I wish you could too. You work so hard I'd like to see you up here right now.

Thank you.

Apollo 9, Houston. You are coming up over Baja California now.

Oh, yes; there it is down there.

TEXAS (REV 76)

Houston, this is Apollo 9.

Go ahead. Apollo 9, Houston.

Coming across here, looks like we're going to have an awful lot of cloud cover over the States. Where do you want to go to S06? That was supposed to be across the southwest U.S., wasn't it?

Stand by, Apollo 9.

Okay.
Roger, Apollo 9. We'll give you a Mark on when to start, and we are looking at this.

Okay.

Okay. We're going across Atlanta, Georgia, right now, and we can see Dobbins Air Force Base and the whole city.

Sounds great.

Okay. We got a couple of pictures for the folks.

Real good.

END OF TAPE
05 01 11 18 CC Apollo 9, Houston. Dave, that switch you made on the BIOMED harness is working real well. We're getting good data.

05 01 11 26 CDR Okay, but this is Jim. I'm on Dave's lead now. He's not plugged in yet. Did you get mine? You get my respiration count?

05 01 11 37 CDR Houston, Apollo 9.

05 01 11 38 CC Roger, Apollo 9. Copy, and we are getting it.

05 01 11 43 CDR Okay. Ask those doctors if they can tell when we switch COMM leads.

05 01 11 49 CC Okay.

05 01 11 52 CDR 'Cause if they can't they are sure going to have some screwy data.

05 01 12 08 CDR Just as a matter of interest, Dave is working on his right now, too. So as soon as he gets plugged back in, you want to call us and let us know whether his are fixed?

05 01 12 17 CC Okay, Jim. We sure will.

05 01 12 24 CDR He's going to be on the left hoses for awhile.

05 01 12 29 CC Roger. Houston understands.

05 01 15 28 CC Apollo 9, this is Houston. You are GO for SPS-6. I'd like to toss in a reminder about the pitch 1, yaw 1 circuit breakers are OUT.

05 01 15 37 CDR Okay; fine. Thank you. Why did you want those circuit breakers OUT this morning?

05 01 15 41 CC Roger. It was working on the BATT A problem.

05 01 15 47 CDR Okay. You don't want them on any longer, then, do you?

05 01 15 53 CC We'd like to have them IN for the burn, and then pull them out after the burn again.

05 01 16 00 CDR Okay.
05 01 16 05 CDR You have to keep reminding us about them, then.
05 01 16 25 CC And, Apollo 9, Houston. I'm going to lose you in about a minute here off of Canaries. If you could, we'd like to have an estimate of when you closed the flight and postlanding battery bus. A circuit breaker, and - This is just for our power consumption.
05 01 16 54 CDR Houston, I don't think we have any idea when that thing got closed. It must have got closed earlier at night.
05 01 17 00 CC Okay, Apollo 9. Understand.
05 01 17 05 CC We'll see you over Tananarive around 33.
05 01 17 10 CDR Roger.

TANANARIVE (REV 77)

05 01 35 01 CC Apollo 9, Houston through Tananarive. How do you read?
05 01 35 06 CMP Stand by, Houston.
05 01 35 09 CC Okay. When we pick you up over Carnarvon you are going to be rocking right on the burn time. We are afraid we won't get the command in. We'd like to have you go PCM bit rate HIGH at 43. That will be approximately 5 minutes prior to the burn.
05 01 35 29 CMP Okay. PCM bit rate HIGH at 43.
05 01 35 33 CC Roger. That's correct. Thank you.
05 01 35 36 LMP Are you through with your troubleshooting on the batteries? We'd like to get the circuit breakers set for the SPS.
05 01 35 46 CC Roger. Go ahead and put in the circuit breakers.
05 01 35 51 LMP Okay. Thank you.
05 01 38 32 CC And, Apollo 9, Houston. We're coming off Tananarive. We'll see you over Carnarvon right at your burn.
05 01 38 39 CDR Roger.
05 01 38 40 CMP Roger.
CARMARVON (REV 77)

05 01 48 41 CMP Ullage.
05 01 49 14 CMP Houston, Apollo 9.
05 01 49 16 CC Go, Apollo 9.
05 01 49 18 CMP Okay. We got no ullage that time, so we aborted the burn; we'll regroup here and try to figure it out.
05 01 49 28 CC Roger. We copy, Apollo 9. Check Charlie Delta in the DAP.
05 01 49 44 CC Apollo 9, Houston. We'll be looking one REV later for the burn.
05 01 49 49 CMP Okay.
05 01 50 05 CMP Roger, Houston. We see CD OFF which means we shouldn't - But I had just reset the DAP to turn it back on about 7 or 8 minutes ago.
05 01 50 21 CC Okay, Apollo 9. Roger. We copy. And there - We really didn't get our data until your ignition time and your next - A rough cut at the next ignition is 123 plus 28.
05 01 50 38 CMP Okay. 123 plus 28.
05 01 50 45 CC We'll be taking a look at our data and looking at the DAP here, see if we can psych this out.
05 01 50 52 CMP Okay. We even have a cross-check on setting the DAP, and thought we had it all squared away.
05 01 50 59 CC Understand, Apollo 9.
05 01 52 42 LMP Houston, 9.
05 01 52 45 CC Go, Apollo 9.
05 01 52 47 LMP Roger. You want us to go back to low bit rate?
05 01 52 54 CC That's affirmative, Apollo 9. Thank you.
05 01 52 58 LMP Okay.
05 01 55 34  CC Apollo 9, Houston. We'll see you over the Huntsville around 03.
05 01 55 40  CDR Roger. Have you had a chance to look at anything yet?
05 01 55 43  CC We don't have any good word yet for you, Apollo 9. Maybe over Huntsville here we will pass some words of wisdom.
05 01 55 51  CDR Okay.

HUNTSVILLE (REV 77)

05 02 03 05  CC Apollo 9, this is Houston through Huntsville.
05 02 03 24  CC Roger.
05 02 03 27  CDR Hello, Houston. Apollo 9, here.
05 02 03 30  CC Roger, Apollo 9. This is Houston through Huntsville. How do you read?
05 02 03 35  CDR ... 
05 02 03 42  CC Okay. Apollo 9, this is Houston. I think you're reading me. You're not coming back too strong. We are looking at the - at the DAF playing the data back. We will have some words on that. I'd like to post you on something; am I getting through at all?
05 02 04 02  CDR You're coming through very weak.
05 02 04 27  CDR Houston, this is Apollo 9. We're reading you weakly but clearly. Go ahead.
05 02 04 31  CC Okay. I think we've got good solid two-way lock, now. How we?
05 02 04 36  CDR You're still weak but clear.
05 02 04 37  CC Okay. What we're thinking of here, this 0065 pass as scheduled is a prime one; there is a front moving in that will probably have it blanked out tomorrow. We do have aircraft out off of Los Angeles and around Tucson showing the cloud cover is good. You're only going to have about 32 minutes from
the SPS-6 until the time we want the first picture taken, and if we get you all your PADS and give you warning, do you think you can get configured for that in 32 minutes after the burn?

5020521 CDR I think your ques ... in 32 minutes after ... is that the question?

5020531 CC That is the question and our COMM here is pretty bad. We'll have Hawaii at 11. We'll still be on here for about another 4 minutes but you're breaking up badly coming in here. But you do have my right question. Can you be prepared to take your first pictures 32 minutes after the burn?

5020550 CDR Roger. I believe that we can ... 

5020553 CC Okay; copy. Thank you, and we'll really go to work and have everything rocking on ready.

5020559 CDR Okay.

HAWAII (REV 77)

5021403 CC Apollo 9, Houston. We have you through Hawaii.

5021406 CMF Roger.

5021409 CDR We are getting that SO65 checked out right now.

5021411 CC Okay. Real good, and a question, Dave. When you said you had cross-checked it, did it mean that after you had gone through the VERB 48, you recalled VERB 48 and checked the load?

5021424 CMF No. As we were going through, both of us - Two of us watched us do it.

5021430 CC Okay. Roger. We are going to take another look at the data, but also wondering about after loading up R1, R2 proceed vice ENER ...

5021443 CMF No; I proceeded through it to check the weight and the pitch trim, yaw trim again.

5021451 CC Okay. I guess what I'm saying is after you did get in the DAP load, maybe you missed an ENER
there before you proceeded on through to the weight.

05 02 15 06 CMP
Roger. I understand what you mean.

05 02 15 08 CC
And our data - We're trying to take a look at it, but we really can't psych anything out yet, and I was just wondering if you had recalled it to verify that it was actually in.

05 02 15 26 CMP
No. We didn't go back and recall it again.

05 02 23 02 CC
Apollo 9, this is Houston. I know you are real busy. You're coming up on a long pass here. We'll have you for about the next 20 - 22 minutes, and I have SPS-6 PAD anytime you are ready.

05 02 23 13 CMP
Okay. Stand by, please.

05 02 23 16 CC
Roger.

05 02 23 36 CMP
Okay. Houston, 9. Go ahead with the PAD.

05 02 23 39 CC

05 02 25 15 CMP
Roger. Copy. 123 25 0590, minus 00388 all zips all zips 00388 00240 0014, 17010, minus 089, minus 113 12 35500 23400, minus 0646, minus 01109 1 ...

05 02 25 58 CC
Apollo 9, Houston. I think we are in the middle of a rendezvous here. Let's stand by for about 10 seconds.

05 02 26 04 CMP
Roger.

05 02 26 07 CC
Okay. I've got you now. You dropped out on a couple of those, Dave. Would you read me DELTA-V, trunnion, and the latitude and altitude?

05 02 26 21 CMP
Okay. On DELTA-V, 0020; trunnion, 23400; longitude, minus 01109; and the altitude, ... U.S.
05 02 26 38  CC  Roger. Copy that. I am showing latitude 0646.
05 02 26 44  CMP  Roger. 06 ...
05 02 26 46  CC  Okay. Very good. You have the PAD.
05 02 26 49  CMP  Thank you.
05 02 26 55  CMP  I guess we'll assume that the DAP's working all right. And we'll run through it.
05 02 27 02  CC  That's our assumption. Let's assume that right now, Apollo 9. We are looking at it.
05 02 27 07  CMP  Okay.
05 02 27 55  CC  Apollo 9, Houston. We'd like to have FOO in ACCEPT. We'll give you a state vector and a target read.
05 02 28 06  CMP  Okay. You have FOO in ACCEPT.
05 02 28 09  CC  Roger. Understand. We'll be shipping it up.
05 02 29 08  CC  Apollo 9, it will be about another minute before we start shipping to you. We are getting a dump.
05 02 34 28  CC  Apollo 9, Houston. The computer is yours. The vector compare looks real good.

END OF TAPE
Apollo 9, Houston. We've got about 3 minutes left in this pass. I have your S065 update when you are ready.

Stand by one.

If we don't get it here, it will be no sweat. We will have Ascension at 51.

Okay. About 10 seconds.

Okay.

Go ahead, Houston.

Okay. S065 update: 16000 32750 000 123 55 20, N flash A; the next block - I want this ORB RATE; your first area in southwest U.S., 124 00 20 06 25. We would like to have a second area, which will be Houston, 124 05 15 06 03. Also, now, with the hand-held camera, I would like to give you a time here of 124 plus 03 plus 28. We would like to have about four pictures looking north of the ground track with the hand-held camera. This is just about as far north as we've come in any of the orbits. We would just like to have some pictures up there. I would like to make a comment on this southwest U.S. pass. The weather is clear from Los Angeles to Tucson. You will be just past Tucson when you have had exposure 15. As you come into El Paso, if it looks like it's completely socked over, you can terminate, but we want to keep going up through 15.

Okay. Want a readback? Do we have time?

We've got about 30 seconds. Go ahead.

Okay. 180 327 and a half 0123 55 20 NA; ORB RATE. Southwest U.S., 124 00 20 06 25; Houston, 124 05 15 06 03.

Apollo 9, this is Houston through Ascension. And Rusty, I got the readback all the way through the
SO65. I just wanted to make sure that you got my additional comments.

Okay. The additional comments: The weather is clear from LA to Tucson, and you figure that we'll get to Tucson about the 15th exposure; and using our judgment, if beyond that it looks now like it's clobbered in, to go ahead and forget them. Understand that at 124 03 28, with a hand-held camera, you'd like pictures looking north of the orbit track. And I wonder if you could give us an orbit rate?

Okay. Stand by.

Degrees per second.

Okay. We'd like it in degrees per second.

Roger. Understand.

Houston, this is Apollo 9.

Go ahead, Apollo 9. This is Houston.

Roger. These angles that you sent us, are those inertial angles or those local vertical angles? This is for SO65.

Roger. Those are your ORB RATE angles. Now, it - on your FPAI.

Roger. Do you have a corresponding set of inertial angles that we can have?

Stand by.

Houston, Apollo 9.

Go ahead, Apollo 9.

Okay. One more question on that. If you will check the checklist, CMP 3-15, there is an ORB RATE column there, and it goes 0, 90, 180, and 270 degrees. Could you give us a word on that? What those are?

Roger. Copy, Apollo 9. Stand by.

Okay.
Apollo 9, this is Houston. You are GO for SFS-6, and we are working on your question.

Roger. GO for 6; thank you.

Apollo 9, Houston. About 30 seconds LOS Ascension. We'll see you at Tananarive about 09, if we can talk to you.

Okay. I've got a quick question. All these angles that you are going to get us are based on the REFSMAT that we had in there for the previous burn, right?

That is affirmative, Apollo 9.

Okay.

And on your attitudes for the burn, you will be about two-tenths off. I didn't bother passing those. It's essentially 000.

Okay. Very good.

Come on; you are falling down on the job.

Okay. Sorry about that.

Houston.

Go ahead.

TANANARIVE (REV 78)

Apollo 9, Houston through Tananarive. Do you read?

Apollo 9, this is Houston through Tananarive. I am not reading you; your ORB RATE is 0.067.

Apollo 9, this is Houston. We'll see you over Carnarvon at about 22, just before your burn.

Carnarvon 22.

And, Apollo 9, I'm not getting you back. You're busting up. Your ORB RATE is 0.067, and we'll have the rest of your angles for you after your burn.
05 03 10 56  CC  Dave, if you can read me, I'll pass this to you now. The checklist there on CMP 315 - Those values are to be used; those are your roll angles. In other words, in this one, where you're at 180 degree roll, you would use that column versus your ORE RATE of 0.067 to get those values to load in for the procedures.

05 03 11 39  CC  Those are your outer gimbal angles, Dave. I'll cover this with you again because I may not be getting through.

CARNARVON (REV 78)

05 03 22 47  CC  Apollo 9, Houston through Carnarvon. Standing by for your burn.

05 03 22 51  CMP  Roger. And I think the DAP is squared away. What does it look like down there?

05 03 22 57  CC  We don't have data yet, Apollo 9.

05 03 23 01  CMP  Okay.

05 03 23 02  CC  Roger. It is GO.

05 03 23 05  CMP  Okay. Thank you.

05 03 25 43  LMP  Houston, this is Apollo 9.

05 03 25 45  CC  Go ahead, Apollo 9.

05 03 25 47  LMP  Got our residuals for you: plus 1.2, minus 0.4, and minus 0.3; DELTA-V counter is minus 13.1.

05 03 25 59  CC  Roger. Copy. Plus 1.2, minus 0.4, minus 0.3, and minus 13.1.

05 03 26 06  LMP  Roger. And that pitch attitude: 35½ degrees.

05 03 26 15  CC  Roger. Copy.

05 03 26 18  LMP  That one g you earthlings have down there is quite a sensation.

05 03 26 29  CC  Roger. And Dave thanks you from the bottom of his computer for that pitch angle.

05 03 26 31  LMP  Roger.
Okay. Apollo 9, Houston. We're going to have you here for about another two and one-half minutes at Carnarvon. I believe you got your ORB RATE, 0.067, over Tananarive. And that page 3 dash 15, what that is telling you is your outer gimbal - That's your roll angle. We are going to have you with a roll of about 180, so you will use that column versus your ORB RATE to get your parameters to load in the procedure.

Okay. Fine, then. I copied your whole transmission over Tananarive and I think we've got it in hand. Thank you.

Roger. And I'll have you some inertial angles here at the start of your ORB RATE shortly.

Okay. Thank you.

Apollo 9, Houston with your inertial angles.

Go ahead, Houston.

Roger. Roll, 0; pitch, 332.6; yaw, 359.5; and the time of this will be 55 plus 20.

Roger. Understand. Roll, 0; pitch, 332.6; yaw, 359.5; and the time is 55 plus 20.

Roger.

And we are going to lose you here at Carnarvon. We'll probably see - see you at Hawaii around 48. We'll have a low pass on Guam this time.

Okay. Fine.

Apollo 9, Houston through Guam. Do you read?

Roger, Houston. Reading you five-by.

Okay. I'm reading you a little weak. But Dave, I don't know if I've confused you on this page 315 or not, but that top column is your outer
05 03 37 05 CMP
Okay. I was just going to ask you about that. You gave him some roll of zero degrees so that's our attitude.

05 03 37 11 CC
Roger. That zero degree inertial looks - looks good, and so that top column is your outer gimbal angle.

05 03 37 19 CMP
Okay; very good. Thank you.

05 03 37 21 CC
Roger.

05 03 39 03 CC
Apollo 9, Houston. If you read me, the roll on our S065 PAD where we gave you 180 should be zero.

05 03 39 12 CMP
Oh, okay. The roll on the S065 PAD should be zero. Understand.

05 03 39 16 CC
Roger.

HAWAII (REV 78)

05 03 48 59 CC
Apollo 9, this is Houston through Hawaii. Standing by.

05 03 49 04 CMP
Roger. We're getting set up.

05 03 49 06 CC
Very good.

05 03 49 09 LMP
When we come over, I want you to smile now, Stu.

05 03 49 11 CC
Okay. And we've sent somebody outside, said it was clear out here.

05 03 49 17 LMP
Is it clear?

05 03 49 19 CC
Yes it is, here.

05 03 51 56 CC
Apollo 9, Houston.

05 03 51 59 CDR
Go ahead, Houston.

05 03 52 01 CC
Roger. We would just like to remind you, when you get into the checklist on S065, and you disable jet A3, to reenable quad C in the DAP.
Houston, we have elected to go on and use A and - A and B here.

Roger. Understand, Apollo 9.

We - When you get the redlines, C is by far the lowest, and we didn't figure we were going to be firing that many pulses as we went along here. The chance of us firing a pulse at the time we took a picture is rather remote.

Roger, Apollo 9.

Houston, this is Apollo 9.

Go, Apollo 9.

Listen, this technique isn't working; we're driving the wrong way or something up here, and we're not going to be vertical - it doesn't look like. You want us to just take over and try to fly it around manually or skip it?

Roger. We copy, Apollo 9.

Better hurry up; we gotta start taking pictures right now.

Roger. We'd like you to take over and do it manually.

Okay.

TAMMS (REV 78)

Houston, Apollo 9.

Go, Apollo 9.

Hey, Houston, we still have the three to take over Houston, haven't we?

I didn't copy that; you busted out, Apollo 9.

Roger. We have the three pictures to take over Houston. We had better get those procedures squared away.

Roger.
Okay. You guys are coming over about now, Apollo 9, snapping away.

Yes. It's quite a sight.

Clear as a bell down there.

Okay. We won't move.

Don't move. Smile.

And did you get a good picture of the oil slick off the coast?

Houston, Apollo 9.

Go, Apollo 9.

This is the uncertain angle ... I took seven pictures instead of three.

Roger. Copy. You took seven instead of three.

... And, Jim, you're breaking up and Dave is coming through loud and clear.

... Did you take into account the fact that ... Houston?

Apollo 9, this is Houston. You're breaking up quite badly. I can not read you.

Roger. Thank you.

Houston? You still with us?

Roger. We show you - We still should have good lock on you; however, you are breaking up quite badly, Apollo 9.

Okay. How about now? You read us now?

That's loud and clear.

Okay. I guess we have some question about the platform alignment, too, since we have aligned retrograde. The uprate technique with the DAP works real well; it just looked like we were going the wrong way.
Roger. Copy. And GNC here has a lot of good words to say about that. Sounds like you are absolutely right.

Okay. Then maybe we can get them squared away for next time.

Roger. It looks like we went V cross R instead of R cross V.

Roger. At least fundamental.

It's not all at first, either.

Roger.

Anyway, next time we try it, how about when you give us the update, give us the PAD with the inertial gimbal angles on it, and add to it the ORB RATE, and we can probably go from there and set this thing up pretty good.

Roger. We'll do that. We'll have inertial angles and ORB RATE on the next PAD.

Okay; thank you. You might also have the orbit rate angle, too, because we could monitor that on the ORB RATE ball.

Roger. Understand.

Houston. How do you read me now?

You're loud and clear, Jim.

Okay.

And, Apollo 9, Houston. Show you coming across the Caribbean. We'll have you for about another 8 minutes.

Okay.

Houston, this is Apollo 9.

Go, Apollo 9.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 04 11 27</td>
<td>CMP</td>
<td>Okay. According to this flight plan update you gave us this morning, you were going to give us a time for a nominal F52 alignment. Do you have that data for us yet?</td>
</tr>
<tr>
<td>05 04 11 35</td>
<td>CC</td>
<td>Roger. It's in work. We'll have it here before we lose Antigua.</td>
</tr>
<tr>
<td>05 04 11 40</td>
<td>CMP</td>
<td>Okay. When are you going to send us the PAD for landmark tracking?</td>
</tr>
<tr>
<td>05 04 11 44</td>
<td>CC</td>
<td>Say again, Apollo 9.</td>
</tr>
<tr>
<td>05 04 11 47</td>
<td>CMP</td>
<td>When are you going to send us the PAD for landmark tracking?</td>
</tr>
<tr>
<td>05 04 11 50</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 04 11 56</td>
<td>CC</td>
<td>Stand by. We'll try to have that over Ascension, Apollo 9.</td>
</tr>
</tbody>
</table>

END OF TAPE
Okay, Apollo 9. I have your time for the nominal alignment.

Okay. Go ahead.

Roger. 125 plus 03 plus 00.

Roger. 125 plus 03 plus 00.

That's affirmative.

Apollo 9, this is Houston. We would like to have a voice check here to check our S-band. That's what was breaking up on the pass over the last site.

Okay. Voice check: 1, 2, 3, 4, 5, 5, 4, 3, 2, 1. Apollo 9.

Oh, that's beautiful! Loud and clear.

Okay.

Houston, I might make a comment on this S065. It seems to have worked very well. It's easy to put together, and it seems to take pretty good pictures. I don't know about the quality, but it's easy to operate.

Okay. Copy. How did it look from Tucson to El Paso, Jim? Did you take those pictures?

Roger. We took the pictures, but I couldn't tell exactly what the cloud cover was. Let me let Dave answer you.

It was a scattered deck, you know, like probably 2000 feet or so. Other than that it was pretty good, but ... soon as we got to within about a couple or 3 minutes of Houston, it broke out in the open.

Okay. Real good. That was our report according to aircraft from Los Angeles. Tucson was supposed to be clear, and I think with the scattered deck it should still be good with the word I had. I'm glad you took them.

Better to take them today, than to not take them tomorrow.
That's right. And we're going to lose you in about 20 seconds here. We'll see you at Ascension at 26.

Okay.

ASCENSION (REV 79)

Apollo 9, Houston through Ascension.

Roger, Houston. Apollo 9, here.

Roger. Good evening.

Hi. How are you?

Good shape; good shape. About ready for our evening fireside chats again, looks like.

Yes. When you said good evening I was absolutely amazed. I looked at my watch; it says 3:30 down at the Cape.

That's right.

How are you there, Mr. Ron?

Good shape; good shape. We're working on our landmark tracking PAD. We should have that before we finish up here, I hope.

Okay. I want you people to realize that we are having this trouble with the shaft on the telescope, and we may not be too successful with this thing.

Roger. We understand that.

Alright.

Apollo 9, Houston. Have your landmark update.

Let me get set.

Apollo 9, Houston.

Roger, Houston. Go ahead.
(GOSS NET 1)

05 04 30 01 CC Okay. You're real weak there. I'll go ahead and read. Your landmark ID 011: your GET, 125 32 1600; and you'll be 60 miles north of track.

05 04 30 30 CC We have about 30 seconds to LOS; probably Carnarvon at 57.

05 04 30 36 CMP Roger. Say again the roll, pitch, yaw, shaft, and trunnion?

05 04 30 41 CC Roger. We don't have that now; NA.

05 04 30 46 CMP Okay. I missed the number. Was it 011?

05 04 30 48 CC Affirmative. Landmark ID is 11.

05 04 30 51 CMP Thank you, and 125 32 1600.

05 04 30 55 CC Roger.

CARNARVON (REV 79)

05 04 57 41 CC Apollo 9, Houston through Carnarvon. Standing by.

05 04 57 45 LMP Roger, Houston. Apollo 9, here.

05 04 57 49 CC Roger. I just wanted to make sure that you got the word that that landmark is 60 miles north of your track.

05 04 57 56 LMP Roger. Sixty miles north; thank you.

05 05 00 01 CC Apollo 9, Houston. Thirty seconds LOS; Guam at 07.

05 05 00 06 CDR All right. Very good.

GUAM (REV 79)

05 05 07 43 CC Apollo 9, Houston through Guam.

05 05 07 47 CDR Go ahead, Houston. This is Apollo 9.

05 05 07 50 CC Roger, Jim. If you have got time - a minute, we've got a FUGS switch test we'd like to have you copy and perform. If you don't have time here, we can do it later, but --
Houston, Apollo 9 here. I'm having a pretty tough time reading you.

9, Houston. How now?

That's much better.

Okay, Jim. We have a PUGS switch test we would like to have you perform if you have time.

Okay. Just a minute.

Okay. You want us to copy this thing down, or you want us to do it just as we are talking to you?

You can do it, but it will take SPS-13 malfunction procedure.

Okay. Stand by one.

9, Houston. I can probably read it to you as we go.

Okay. Go ahead; I've got the SPS-13 cut end up.

Okay. SPS gaging to AC-1.

Roger. Gaging to AC-1.

SPS heaters and gaging, main A and main B, CLOSED.

Stand by.

Roger. They're CLOSED.

PUGS mode switch to NORMAL.

Roger. PUGS mode to NORMAL.

And test switch to POSITION 2 for 8 seconds.

Roger. It was there for 8 seconds.

Roger. PUGS mode switch to AUXILIARY.

Roger. PUGS mode to AUXILIARY.

Okay. Do SPS-13, box 2 and 4, and let us know of any results.
05 05 10 21 IMP Okay.
We would like the quantity readings and the unbalance meter before and after each activation of the test switch.
05 05 10 44 LMP Okay. You were a little late on that request. I'm not sure where it started. I just finished Test 1 for 10 seconds, and they're reading 24.9 and 23.4, and the unbalance is reading 400-INCREMENT.
05 05 11 07 CC Roger.
05 05 11 43 LMP Okay. I have gone to 2 for 10 seconds, and they read 23.5 and 22.0.
05 05 11 52 CC Roger.
05 05 11 56 LMP And the unbalance is 380 - again on the increase side.
05 05 12 03 CC Roger. 380-INCREASE.
05 05 12 15 IMP Okay. And you also want block 4, right?
05 05 12 17 CC Affirmative; block 4.
05 05 13 06 LMP Okay. And I just performed - Are you still with me, Houston?
05 05 13 09 CC Affirmative.
05 05 13 10 LMP Okay. Just performed block 4, and after the initial jumpback on the normal systems, it was reading 23.1, 21.1, INCREASE-500, and it remained there all through block 4. No change.
05 05 13 27 CC Okay. We copy.
05 05 13 29 LMP Although the caution warning light did come on after about 5 to 6 seconds.
05 05 13 36 CC Okay.
05 05 14 10 CC 9, Houston. We'd like to verify that you are in PRIMARY and not NORMAL when you went through block 4.
05 05 14 18 LMP I beg your pardon; I was in NORMAL.
05 05 14 22 CC Okay.
05 05 14 25 CC Roger.  
05 05 14 52 CC 9, Houston. If you can hold off there, we're about LOS. We'll catch you first time in Hawaii on that.  
05 05 15 01 LMP Roger.  
05 05 15 10 CC Will be Hawaii at 22.

HAWAII (REV 79)

05 05 22 43 CC Apollo 9, Houston through Hawaii.  
05 05 22 48 CMP Roger. Houston, Apollo 9.  
05 05 22 49 CC Roger. Loud and clear. On this FUGS switch test, we'll let you continue with your landmark tracking there, and we'll check back over Guam the next rev.  
05 05 23 03 LMP Okay.  
05 05 23 47 CC 9, Houston. We're watching your middle gimbal angle for you, and we'll keep you advised.  
05 05 23 52 CDR Roger.  
05 05 23 54 CMP I'm keeping a pretty close eye on it, too.  
05 05 23 56 CC I would assume so.

TEXAS (REV 79)

05 05 36 55 CMP Houston, Apollo 9.  
05 05 36 57 CC Houston. Go.  
05 05 36 58 CMP Okay. Everything was working good in the optics until I went out of AUTO optics and started trying to track it manually, and the shaft and telescope hung up again.  
05 05 37 10 CC Great.  
05 05 37 13 CMP And I tried to get it unstuck there by releasing it manually, and finally got it to move again, but then got a POO's NO-GO at the Mark program alarm, so I guess it was probably out of sync.
05 05 37 33 CC Roger. Understand.
05 05 37 46 CMP Houston, generally it looked like this roll technique - yaw and then roll technique looks pretty good. The roll rate was such that I would not have had to use hardly any drive on the optics to take the Marks, except I could not get any shaft, and that's what wiped me out.
05 05 38 05 CC Okay. Very fine.
05 05 38 07 CMP If somebody could figure out a way to unstick this shaft, you know, like permanently, I think we'd be in good shape.
05 05 38 14 CC Okay. We're tearing one apart over here now, and trying to take a look at it to see if we come up with anything.
05 05 38 19 CMP Okay. I'm sure you are.
05 05 38 50 CC Apollo 9, Houston. If you are through with the computer there, we'd like to have you go to POO and look at your REFSNAP data some time before we leave Texas.
05 05 38 57 CMP Okay. Stand by.
05 05 40 52 CC 9, Houston. We only have about 1 more minute here at Texas, and then Tanaarive at 16.
05 05 41 05 CMP Roger. You've got POO in ACCEPT as soon as - I guess - the computer gets through integrating forward.
05 05 41 11 CC Roger. We don't need ACCEPT.
05 05 41 19 CC Be advised your sweet little secretary will be listening, probably over Tanaarive - if we can get you.
05 05 41 26 CTR Very good. Give us a holler.
05 05 41 29 CC Okay.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)  

TANANARIVE (REV 80)  

05 06 16 37  CC  Okay. Apollo 9, Houston through Tananarive.
05 06 16 40  LMP  Hello, Houston. Apollo 9, here. Is she there?
05 06 16 43  CC  Roger. Loud and clear, now.
05 06 16 47  LMP  Roger. Is Charley there?
05 06 16 52  CC  Affirmative.
05 06 16 57  LMP  Okay. Stand by, Charley.
05 06 17 00  CDR  Happy birthday to you, happy birthday to you,
05 06 17 00  CMP  happy birthday, dear Charley, happy birthday
05 06 17 00  LMP  to you.
05 06 17 20  CC  She's getting a great kick out of it and says,
05 06 17 20  "Thank you."
05 06 17 25  CDR  Okay. Sorry we didn't have time to celebrate
05 06 17 25  before the launch.
05 06 17 35  CC  She said it was beautiful.
05 06 17 39  CDR  Okay. We think she is, too.
05 06 17 43  CC  Roger.
05 06 17 47  CC  When you get a chance there, we could use the
05 06 17 47  number of frames used on S065.
05 06 17 56  CMP  Okay. We used what we were supposed to from
05 06 17 56  California on over toward Texas and used seven
05 06 17 56  frames across Houston. We used one frame to check
05 06 17 56  the thing out when we put it up in the window to
05 06 17 56  make sure that all of the film magazine ... and
05 06 17 56  we used one additional frame.
05 06 18 26  CC  Roger. One additional, one to start, seven over
05 06 18 26  Texas, and seven somewhere else. Is that correct?
05 06 18 35  CMP  You broke up a little there. There was one to
05 06 18 35  check ... there was one accidental one, seven -
05 06 18 35  I say, there was seven over Houston and there was
05 06 18 35  25 - 25 across southwest U.S.
05 06 18 51  CC  Roger. Copy the 25 and the rest of them.
05 06 18 56  CMP  Okay–dokey.
05 06 19 05  CMP  Houston.
05 06 19 07  CC  Houston. Go.
05 06 19 09  CMP  We were supposed to wind one film - each film pack forward one frame forward by hand, so that one is also gone.
05 06 19 17  CC  Roger. Understand. You wound one frame by hand.
05 06 19 22  CMP  Roger.
05 06 19 36  LMP  Houston, this is Apollo 9.
05 06 19 37  CC  Houston. Go.
05 06 19 40  LMP  We are IMU DOWN. All we're doing is spinning through, keeping it out of gimbal lock, and we don't need it anymore.
05 06 19 53  CC  Roger. Stand by. We're checking it.
05 06 20 06  CC  Apollo 9, Houston. Affirmative. IMU to STANDBY.
05 06 20 11  LMP  Say again, please.
05 06 20 19  CC  Apollo 9, Houston. IMU to STANDBY. We still need the CMC.

GUAM (REV 80)

05 06 41 51  CC  Apollo 9, Houston through Guam.
05 06 42 17  CC  Apollo 9, Houston through Guam.
05 06 43 08  CC  Apollo 9, Houston through Guam.
05 06 43 12  CDR  Hello, Houston through Guam. This is Apollo 9.
05 06 43 15  CC  Roger. If you have got the time there, we would like to go through that PUGS switching test again.
05 06 43 21  CDR  Alrighty. We will get the PUGS switcher up in the seat.
05 06 43 24  CC  Okay.
Houston, this is Apollo 9. I've got some data for you from that last one, if you would like that.

Okay. I think I copied the data. I didn't have what your readings were before you started the test 1 position, though, before you started the malfunction procedures.

Okay. That – I didn't either. That is whatever it was after that last burn when we shut it off. I think we read that down some time, but why don't we just do it again.

Okay. Let's do it again. Just PUGS mode to AUXILIARY and then go through SPS-13, boxes 2 and 4, and give us your readings before you start and after each test position.

Okay. How much time do we have in this pass?

Roger. We've got 2 more minutes – 3 more minutes.

Roger. And, Ron, how about the IMU? Did you say go ahead and power it down or not?

Affirmative. You can fire down the IMU, and if you have POO in ACCEPT, we will give you state vector now.

Okay. POO and ACCEPT – You have it.

Okay. And, Ron, we have 24.9 and 21.2, and the oxidizer unbalance an! OFF SCALE HIGH. Okay?

Roger. Copy.

Okay. I'm in AUXILIARY.

Okay. After 10 seconds in AUXILIARY, it's – the oxidizer unbalance is INCREASE – 400, and the quantities are reading 25.2 and 23.6.

25.2 and 23.6.

Roger.

Okay. And after going to test 2, we have 430 pounds increase, 23.8 and 22.1.

Roger. 23.8, 22.1.
Okay. Going to PRIMARY.

Okay. Now, Ron, after I went to PRIMARY, I went to test 1. The OX increased, the oxidizer unbalanced, jumped right away to FULL SCALE HIGH, and stayed there. Its final readings are 28.6 and 21.4. I am going to test 2 now.

Roger. And we didn't quite get your load in the computer, so we will finish it at Hawaii.

HAWAII (REV 80)

Apollo 9, Houston through Hawaii.

Roger. Houston, Apollo 9.

Roger, Jim. If Rusty's got just the readings from that test 2 position - I didn't get those.

Okay, Ron. The final readings were FULL SCALE HIGH increase on the UNBALANCE, and 27.1 to 21.4 OX and fuel.

Roger. FULL SCALE HIGH 27.1 and 21.4.

And the MASTER ALARM came on in all - on all the tests and after about 6 or 7 seconds.

Roger.

And, Houston, Apollo 9. We went over the hill with the VERB 33 cell so we have to proceed for you.

Roger.

Do you want to check anything before we power it down?

Affirmative. If you'll stand by we'll do it down here for you.

Alrighty.

Dave, on your EXG - we still don't have one down here, so what we're recommending is that you switch out your blue sternal lead there with that spare set.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 06 58 51</td>
<td>CMP</td>
<td>Roger. Understand the blue sternal suit leads to the spare set. Okay. I've taken the thing all apart again so I guess that must be it.</td>
</tr>
<tr>
<td>05 06 58 59</td>
<td>CC</td>
<td>Okay, because we still aren't getting any.</td>
</tr>
<tr>
<td>05 06 59 08</td>
<td>CC</td>
<td>9, Houston. I've got a target of opportunity at about 126 plus 13 if you want it.</td>
</tr>
<tr>
<td>05 06 59 15</td>
<td>LMP</td>
<td>Roger. 126 plus 13?</td>
</tr>
<tr>
<td>05 06 59 18</td>
<td>CC</td>
<td>I'm sorry. 127 13.</td>
</tr>
<tr>
<td>05 06 59 21</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>05 06 59 32</td>
<td>LMP</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>05 06 59 34</td>
<td>CC</td>
<td>Roger. And we need a VERB 66 on the computer, also.</td>
</tr>
<tr>
<td>05 06 59 39</td>
<td>LMP</td>
<td>I've got a VERB 66 coming up.</td>
</tr>
<tr>
<td>05 06 59 46</td>
<td>CC</td>
<td>Your targets of opportunity are Galapagos Islands, it's south of track about 15 degrees elevation angle. And start at 127 plus 13 plus 23. Try five exposures, 6 seconds apart.</td>
</tr>
<tr>
<td>05 07 00 16</td>
<td>LMP</td>
<td>Okay. The Galapagos, south of track 15 degrees elevation angle, 127 13 23; five exposures, 6 seconds apart.</td>
</tr>
<tr>
<td>05 07 00 26</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 07 00 30</td>
<td>LMP</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>05 07 00 32</td>
<td>CC</td>
<td>Houston. Go.</td>
</tr>
<tr>
<td>05 07 00 39</td>
<td>CC</td>
<td>9, Houston. Go.</td>
</tr>
</tbody>
</table>

REDSTONE (REV 80)

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 07 02 29</td>
<td>CC</td>
<td>Apollo 9, through Houston - through Redstone this time.</td>
</tr>
<tr>
<td>05 07 02 34</td>
<td>CDR</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>05 07 02 35</td>
<td>CC</td>
<td>Houston. Go.</td>
</tr>
<tr>
<td>05 07 02 37</td>
<td>CDR</td>
<td>Roger. I have a couple of questions. Do you want us to use any fuel to take that picture,</td>
</tr>
</tbody>
</table>
the target of opportunities picture? And the second thing I just wanted to tell you, we have four or five 16-millimeter magazines of film left for exterior and we were planning on putting the 75-millimeter lens on and shooting some targets across the ground. You might sort of put that into the flight planners' minds and see if they have anything in particular they would like me to take a picture of.

05 07 03 05 CC Will do.
05 07 03 35 CC Apollo 9, Houston. Negative on the fuel for that target. If you can see it, okay. If you can't, fine.
05 07 03 43 CDR Okay. Very good.
05 07 03 46 CC And vector compares good. However, leave the computer going; I think this is one thing we might want to keep powered up this evening.
05 07 03 56 CDR Okay. Very good.
05 07 06 18 CC Apollo 9, Houston. We've come up with a cryo plan here, if you'd like to copy some of the things down.
05 07 06 44 CC Apollo 9, Houston.
05 07 06 48 CDR Go ahead, Houston.
05 07 06 49 CC Roger. I have a cryo plan, if you'd like to copy some of these things down for the power down.
05 07 06 57 CDR Okay. Just a minute, and let us get a piece of paper.
05 07 06 59 CC Roger.
05 07 07 02 CC We'll hope it works tonight.
05 07 07 05 CDR That's okay. So do we.
05 07 07 11 CWP Go ahead.
05 07 07 14 CC Okay. Allow both $H_2$ tanks to decrease until both tanks are 200 psi or below. Maintain 190 to 200 by cycling $H_2$ tank heaters or fans as required. Maintain the pressure at, but not above, 200 psi.
05 07 08 15  CMP  Are you still with us, Ron?
05 07 08 17  CC  Okay. Fuel cell purges may be used to decrease
this pressure as required to 200.
05 07 08 27  CDR  Fuel cell purges to decrease the hydrogen pressure?
05 07 08 31  CC  Affirmative.
05 07 08 33  CC  If you - If you need to get it down to below 200.
05 07 08 39  CDR  Okay. And then I guess you want us to keep it
all night below 200 by cycling the heaters or
the fans, right?
05 07 08 48  CC  No; I don't want it to start creeping up and we're
hopping that it won't creep up above the caution
and warning limits prior to morning.
05 07 08 56  CDR  But it's all right to let it go ahead on up above
200 after we go to bed?
05 07 09 00  CC  Affirmative. After you go to bed.
05 07 09 03  CDR  Okay.
05 07 09 06  CC  Okay. At your normal powerdown time we want you,
to perform the following: IMU to STANDBY - you
already have that - SCS electronics power switch
off; the AUTO RCS selection switches, OFF; the
rate control power, OFF; translation control power,
OFF; and leave all other equipment powered up.
Over.
05 07 09 55  CMP  Okay. Copy. IMU, STANDBY; SCS electronics power,
OFF; auto RCS, OFF; rotational control power, OFF;
translational control power, OFF; everything else,
ON. Is that correct?
05 07 10 09  CC  That's correct.
05 07 10 10  CMP  Okay. Let me go back to the H₂ again. You want
us to get - Let both H₂ tanks go to 200 or below,
and then keep it between 190 and 200 by cycling
the tanks and fans as required, and not to let it
get above 200 before we go to bed, then let it go.
05 07 10 29  CC  That's correct.
05 07 10 33  CMP  Okay. I guess we got that straight.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
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</tr>
</thead>
<tbody>
<tr>
<td>05 07 10 34</td>
<td>CC</td>
<td>Yes, and before you - Before you go to bed we'll have you turn the tank 2 fans ON.</td>
</tr>
<tr>
<td>05 07 10 41</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>05 07 10 44</td>
<td>CC</td>
<td>And we're testing this type thing; we hope it works. If it doesn't and we see a good trend in the early part of your rest cycle, we'd just as soon call you then, rather than in the middle of the night.</td>
</tr>
<tr>
<td>05 07 11 58</td>
<td>CMP</td>
<td>You're fading out. Would you say the last part again, please?</td>
</tr>
<tr>
<td>05 07 12 01</td>
<td>CC</td>
<td>Roger. We'd just as soon call you early in your rest cycle, rather than in the middle of the night.</td>
</tr>
</tbody>
</table>

END OF TAPE
Apollo 9, Houston through Tananarive.
Apollo 9, Houston through Tananarive.
Houston, Apollo 9.
Roger. I have you.
Say, did you have anything between the discussion on the H₂ and the -
9, Houston. Are we with you now?
Apollo 9, Houston.
—answer. You are coming through loud and clear now. Did you have anything that you gave us between the discussion of the H₂ and the powerdown?
The only thing on — discussion on the H₂, I said that if, for some reason, you can't get it down to 200 psi before you retire, you can go ahead and do a fuel cell purge to decrease the pressure.
The next thing I heard was to — the powerdown. You ordered me to stand by and that sort of thing, and I thought maybe you said something in between.
Negative.
Okay. If you say it is all right to purge number 2.
Stand by.
Okay. In other words, can we purge all three fuel cells?
Apollo 9, Houston. You can purge all three, if necessary.
Okay. And then overnight, do you want us to leave the fans on AUTO or OFF on the cryos?
On the cryos, we want the H₂ tank 2 fan on.
Roger. Understand. H₂ tank 2 fan on.
Roger.
(GOSS NET 1)

Tape 82/2
Page 553

05 07 53 54 CMP
Okay. Thank you.

05 07 53 55 CC
And I have - We have no site coverage for REV 83, and I have the ARIA AOS - LOS times in case you want to call us. Over.

05 07 54 10 CMP
Okay. Go ahead.

05 07 54 12 CC
Roger. ARIA 6 130, plus 42 2130, plus 53. ARIA 2 131, plus 35 2131, plus 44. Over.

05 07 54 38 CMP
Roger. ARIA 6 130 42 to 130 53; ARIA 2 131 35 through 131 44.

05 07 54 50 CC
9, Houston. Affirmative.

05 07 55 04 CC
Apollo 9, Houston. About LOS. Stand by for block data at Hawaii, and I will also give you a consumables update at Hawaii.

05 07 55 14 CMP
Roger. Understand. Block data and consumables at Hawaii.

HAWAII (REV 81)

05 08 29 29 CC
Houston, Apollo 9 through Hawaii.

05 08 29 33 CDR
Hello, Hawaii. Apollo 9.

05 08 29 35 CC
Roger. Loud and clear. On that H₂ purge, if it is necessary, and if you haven't already done it, we had just as soon do it on fuel cell 2 only.

05 08 29 46 CDR
Okay, you would like to do it on fuel cell 2 only. Okay. Very good. It looks like we are still going to have to do it, Ron. We are still running about 215 in tank number 2.

05 08 29 55 CC
Roger. We copy.

05 08 29 57 CDR
Okay. We will do it all on fuel cell 2.

05 08 30 02 CC
Okay. And your consumables downdate - downlink plus dosimeter readings, when you get a chance, and then I'll have the block data whenever you are ready to copy.
Okay. Why don't you go ahead with the block data, Ron, and we are getting the other data in the meantime.

Block data: 083 Charlie Charlie, plus 302, plus 1450 131 08 49 3592; 084 Charlie Charlie, plus 262, plus 1380 132 407 3592; 085 Charlie Charlie, minus 245, minus 1610 134 32 19 3592; 086 Alpha Charlie, plus 031, minus 0280 135 05 33 3592; 087 Alpha Charlie, plus 156, minus 0320 136 40 09 3592; 088 2 Alpha, plus 275, minus 0300 138 15 36 3592; 089 2 Bravo, plus 329, minus 0300 139 49 30 3592; 090 1 Bravo, plus 303, minus 0660 141 14 42 3592; pitch, minus 0.69; yaw, minus 1.15. Over.

Okay. How much more time do we have, Ron?

Roger. Still have about 2 minutes.

Okay. You want the systems data first or the readback?

No. Let's get the systems data.

Okay. Service module A is 54, B 62, C 52, and 55 on Delta.

Roger. Fifty -

Okay. And BATT C is 36.9, pyro A is 371, B 371.

Roger. Copy.

Okay. All of the command module RCS injector temps are OFF SCALE HIGH, except 6 Charlie, which was 4.7.

Roger.

Okay. What do we start with on that block data?

Start from 083. Let's hold off on that; I've got a little DSE thing I would like to get to you.

Okay.

On this DSE voice playback - It has a lot of background noise on it. However, the voice seems to be okay. ... When you are transmitting to us over a station, but it kind of fades away to unreadable when you are just talking between stations. So, it looks like, if you want to record any data on the DSE, you must talk directly into the mike and in a loud and clear voice. What I would like to do is after Redstone LOS, give us a test script or something like that, and we will play it back to you. If it is
Roger. Understand you want us to give you a test count on the DSE sometime when we are not over a station. Do you have any particular time you want it for a dump or what?

Affirmative. Just after Redstone LOS. It will be about 128 plus 45 or somewhere in there.

Okay. Understand 125 plus 45 you want us to give you a test count on the DSE and see how that works out.

Roger.

Okay. Okay. Do you want the readback?

Roger. Go ahead and readback.

Okay. 083 Charlie Charlie, plus 302, plus 1480 131 08 49 3592; 084 Charlie Charlie, plus 260, plus 1380 132 40 27 3592; 085 Charlie Charlie, minus 245, minus 1610 134 32 19 3592; 086 Alfa Charlie, plus 031, minus 0280 135 05 33 3592; 087 Alfa Charlie, plus 156, minus 0320 136 40 09 3592; 088 2 Alfa, plus 275, minus 0300 138 15 36 3592; 089 2 Bravo, plus 329, minus 0300 139 49 30 3592; 090 1 Bravo, plus 303, minus 0660 141 14 42 3592; pitch, minus 0.89, yaw, minus 1.15.

Apollo 9, Houston. Your readback is correct. A couple of items. We would like for you to terminate BATT A charge just prior to retiring. Also, put inverter 3 on MAIN A.

Roger. Terminate battery charge just before retiring and put inverter 3 on MAIN A.

Roger.

And I guess we need to verify the CO2 canister change and also that you are going to perform a waste water dump.

Roger. Will verify this time the canister change, and we will be dumping waste water before retiring.

Roger. And, 9, Houston. We show your downlinking both SIMPLEX Alfa, and Bravo, so it's just SIMPLEX Alfa for the night, I guess.
Roger. We’re listening to the tower over Guam, or Vietnam, or wherever it is.

Okay.

9, Houston. We could use the PR – the dosimeter readings if they are available. Also, to give you a warm feeling, I can give you a consumable update.

Okay. We’re ready. We always want a warm feeling. Let’s get out the PAD.

Okay. GET --

Wait a second. Wait a second.

Okay. Hold on.

Let us get out the PAD first.

Roger.

Hey, are Al or Dick or Pete there?

Not right now. I can pass it on to them.

No. Just tell them I said hello.

Will do. They will be in again tomorrow.

Okay. Ready to copy.

Okay. GET 127 44 13 50 16 48 17 47 17 392 30 26 26 39, and just jot down now your service module RCS. DAP redlines are good tonight. A, 29 percent; Bravo, 37; Charlie, 39; Delta, 39.

Okay, Ron. Let me get the second line there. System A – service module RCS to A PU.

Roger. 44 percent PU, 13 percent hybrid DAP.

Okay. Here we go. 127 44 13 50 16 48 17 47 17 392 30 26 26 39, and then the redlines 29, 37, 39, 39.

Dosimeter readout.

Roger. Dosimeter readout. We got it all.
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)  Tape 83/1

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HAWAII (REV 82)

05 10 04 24  LMP  Houston, Apollo 9.
05 10 04 28  CC  Houston. Go.
05 10 04 30  LMP  Roger. I got a couple of dosimeter readings for you.
05 10 04 34  CC  Beautiful. You're making the doctor very happy.
05 10 04 38  LMP  Okay. It's great to make the guy that sticks needles in you happy. Jim is 31.14, and mine is 80.14; that's 80.14, and Dave's is kind of stuck away somewhere. We'll try to pick that up again tomorrow.
05 10 05 00  CC  Roger.
05 10 05 08  LMP  Dave is in the process of contributing to medical science in a different fashion here.
05 10 05 15  CC  Okay. Understand. When you take your battery charger off the line, note the time on it and give it to us tomorrow.
05 10 05 23  LMP  Okay. Tell you what, we’re just about to sack out; why don’t I just take it off right now.
05 10 05 29  CC  Affirmative. You can go ahead.
05 10 05 32  LMP  Okay. How about a 3, 2, 1.
05 10 05 34  LMP  MARK.
05 10 05 39  CC  We got it.
05 10 05 44  LMP  Okay. And I’m just about to purge fuel cell 2. Hydrogen 2.
05 10 05 50  CC  Roger.
05 10 05 58  LMP  There you go.
05 10 07 45  CC  Apollo 9, Houston. About a minute and a half to LOS. We'd like to have the inverter 3 on MAIN A over the site here, if possible.
05 10 07 58  LMP  Say that one again, Ron.
05 10 08 00  CC  Roger. Request inverter 3 on MAIN A.
05 10 08 07  LMP  Okay. 3, 2, 1.
05 10 08 09  LMP  MARK.
05 10 08 10  LMP  Inverter 3 on MAIN A.
05 10 08 13  CC  Roger. That's part of your sleep power configuration there.
05 10 08 18  LMP  Roger.
05 10 08 37  LMP  And, Houston, we got a message from the CMP; he says to tune in to his EKG next pass.
05 10 08 47  CC  Will do. Very good.
05 10 09 08  CC  9, Houston. Have a good night. We'll see you tomorrow.
05 10 09 14  LMP  Guten abend.

END OF TAPE
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(COSS NET 1)

REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(TOSS NET 1)  

GRAND BAHAMA (REV 89)

05 19 55 26  CC  Apollo 9, this is Houston.
05 19 55 39  CC  Ring-a-ring-a-ring! The alarm clock has just gone off, Apollo 9.
05 19 55 45  CDR  ... Roger, Houston.
05 19 55 49  CMP  This is Apollo 9.
05 19 55 50  CC  Roger. We're reading you loud and clear.
05 19 55 53  CMP  Very well.
05 19 55 55  CC  And a cheery good morning.
05 19 56 02  LMP  Houston, how do you read me?
05 19 56 04  CC  I read you loud and clear.
05 19 56 06  LMP  Okay.
05 19 56 10  CMP  Well, we're with you. What would you like to do first?
05 19 56 14  CC  Okay. I've got some block data; I've got a short consumables PAD; and I've got some changes to the flight plan. So, your choice.
05 19 56 28  CMP  Well. I've got the consumables sitting in front of me. Why don't you do that one?
05 19 56 32  CC  Okay. And the - I'm not reading any of the quads; that's the same thing as I gave you last night. I'm starting on the cryo O₂. That is 365, and if you compare the one you had before you'll see that you didn't really use that much. That was a mistake on the other one. H₂: 28 36 26 39.
05 19 57 10  CMP  Okay. 365 28 36 26 39.
05 19 57 18  CC  Okay. That's good.
05 19 57 23  CMP  Okay. Let me flip the page here and look at the flight plan.
05 19 57 23  CC  Okay.
05 19 57 40  CMP  Okay. Go ahead.
Okay. This is the flight plan, right, Dave?

Right. Flight plan.

Okay. Just a reminder on your CO₂ filter. If you'll note the clock, we've let you sleep a little later. And you can turn on the H₂ heaters now for a purge that's coming up.

You want the H₂ tank heaters on, or do you want the H₂ heaters for a purge?

We want the H₂ purge heaters on now.

Okay. That fellow's on.

Okay. And we're recommending that you wait until after breakfast to chlorinate the water instead of the time shown in the flight plan. And I'm going to pass you a time for your nominal alignment.

Go ahead.

14 142, plus 46, plus 44. And that is for your alignment at 142 15.

Okay. And gee, about the water, we might talk about that. We chlorinated it last night just before we went to bed because the thing didn't taste very good for quite awhile, so it seems like maybe if we could chlorinate it before we go to bed normally and keep some sort of system like that --

Okay. Copy. We'll give you some words on that.

Okay. I got the nominal alignment at 142 46 44.

Okay. And at 143 plus 45, where you are doing a P52 alignment in there, we'd like -- we'd recommend that you do this one using the planet option with Jupiter.

That sounds like a fine recommendation. All right. We'll do that with Jupiter.

... Right?

Say the last again?
Roger. That's... REFSMAT. Is that right?

That is the REFSMAT using Jupiter.

Okay. Incidentally, found Jupiter in the sextant the other day, and you can see four moons around Jupiter.

Beautiful. Okay. And on this landmark tracking, we're saying there'll be two landmarks per rev. And also, for today we're recommending trying the sextant vice the telescope.

Okay. We'll give that a try. Two landmarks per rev with the sextant.

Okay. And on over here at 144 25, where we show this landmark tracking, essentially we're substituting S065 for this landmark tracking in here, so at - You can delete the P52 realign at 144 25.

Okay. Understand. Delete the P52 realign at 144 25, so we can do an S065 instead on the landmark tracking. Right? ... don't show a realign at 144 25; 144 25 is the ...  

...  

Okay. All right. Well, we had one back over here. Stand by one.

Okay. Well, yes, you're right, Dave. But anyway, this pass - this landmark tracking pass, in here, at about 144 hours - over here, 145 - We're scrubbing that out. And we'll do an S065, and on that, we'd like to pass you the times. At 145 25 unstow and install your S065.

... Stu?

Yes.

Is this at 145 25, unstow the S065?

That is affirmative.

Wait a second. I thought you just said to do the unstowing at 144 25?

Wait a minute. No. Okay. Somehow or another I got a bad time slipped in here on me, but what
I'm saying is this pass here at - Starting at about 145 hours you are now shoving, now, with the realignment and the landmark and so forth, we are scrubbing that out. And we're deleting that alignment there as shown in your landmark tracking. At 14525 you can unstow and install your S065. And 145 plus 50 will be the approximate time of the S065 pass. Of course, we'll have you a PAD on this later.

END OF TAPE
When you said 145 50 you dropped out, and we didn’t catch what you said after that.

Okay, 145 50 will be the time that you’ll begin the S065. That’s the approximate time, and we’ll have your PAD for you; but that will be the time you’ll - the approximate time you’ll start your S065 pass.

Okay. Understand S065. And you’ll give us a PAD, and it’ll be approximately 145 50. I still have another question in that - the landmark tracking that started at 144 30. That’s still in there; is that correct?

Yes. That’s affirmative, Dave.

Did you copy? That is still in there at 144 40.

Apollo 9, Houston. Do you read me?

Houston, 9. What else do you have?

Okay. And you might start fishing through your - dragging out your block data PAD there ... and just so we’re squared away here; and on over at about 147 35 you’ll have another S065 pass.

Apollo 9, Houston. How do you read?

Apollo 9, Houston. Do you read?

Roger. We’ve got you now. You read us?

Roger. I’m reading you real good. And at 147 35, you’ll have another S065 pass.

Roger. We got that. Is that in lieu of the landmark tracking in that orbit?

That is affirmative. On that rev, we’re substituting S065 in lieu of the landmark tracking.
05 20 07 02  CMP  Okay. We got that. You're not going out.
05 20 07 06  CC   Okay. And one other item. We'd like to have a check made of the optic sun filter whenever it's convenient.
05 20 07 14  CMP  All right. We'll pick that up as we go along. Any particular procedures you want?
05 20 07 21  CC   No. That's negative.
05 20 07 24  CMP  Okay. We'll check it.
05 20 07 25  CC   Okay. And we'd also like to turn inverter 3 off.
05 20 07 35  CMP  All right. Inverter 3 is off.
05 20 07 38  CC   Okay. And we'd like to use Baker Dog roll today.
05 20 07 45  CMP  Okay. ED roll.
05 20 07 52  CC   And we'd like to have a status report at your convenience. How much sleep you got and so forth.
05 20 07 59  CMP  Okay. Gee, I got about 7-1/2 hours, I guess.
05 20 08 17  CDR  This is Jim, and I got about 8.
05 20 08 20  CC   Okay. I understand Dave 7-1/2; Jim about 8.
05 20 08 26  CDR  Rusty said he got about 8-1/2.
05 20 08 30  CC   Roger. Copy 8-1/2. And we're on this SO65 now. The checklist ORB RATE maneuver should work today. We should have the platform pointed in the right direction and all of the vectors crossed right. So we're saying that it will go today.
05 20 08 34  CDR  Very good.
05 20 08 59  CC   And another word on the status report; the medication.
05 20 09 08  CDR  Rusty took an Actifed and Seconal before he went to bed. I had a vitamin pill.
05 20 09 16  CMP  This is Dave. I had a vitamin pill.
05 20 09 18  CC   Okay.
05 20 09 19  CDR  Rusty said he had a vitamin pill, too.
Okay. I understand. Thank you. And that takes care of everything except the block data.

Okay. Go ahead.

And reading block data number 15. 091 1 Baker, plus 335, minus 0680 142 44 15 2844; 092 1 Baker, plus 318, minus 0625 144 19 36 2844; 093 1 Alfa, plus 269, minus 0680 145 52 18 2844; 094 1 Baker, plus 329, minus 1649 148 36 40 2844; 095 1 Baker, plus 333, minus 1640 150 10 27 2844; 096 1 Alfa, plus 291, minus 1650 151 44 00 2844; 097 Charlie Charlie, plus 174, minus 1610 153 19 44 2844; 098 Charlie Charlie, plus 095 - And insure your S-band volume is up please - minus 1710 154 51 55 2844. And your trim angles: pitch, minus 0.89; yaw, minus 1.15. End of update.

Okay. Coming back, if you're ready?

Go ahead. Let her rip.

0911 Bravo, plus 331, minus 0680 142 44 15 2844
09 - We got a little dropout there. Are you still there?

Roger. I'm still with you, and we should have about another 2 minutes.

Okay. 092, plus 318, minus 0625 144 19 36 2844; 09 ... 148 36 40 ... 095 1 Bravo, plus 33 ... 0 ... 150 ... plus 291, minus 1650 151 44 00 2844; 097 Charlie Charlie, plus 174, minus 1610 153 19 44 2844; 098 Charlie Charlie, plus 095, minus 1710 154 51 55 2844; with a pitch trim, minus 0.89, and yaw trim of minus 1.15.

Okay, Dave. On the second line, it's plus 335.

Okay. You were sort of garbled there. 335. Okay.

Okay. And I'm - You're going to have to read the second and third blocks again to me. We had a lot of static; I couldn't get them.

Madrid (REV 69)

Okay. Here comes the second one. 092 1 Bravo, plus 318, minus 0625 144 19 36 2844; 093 1 Alfa, plus 269,
minus 0680 145 52 18 2844.

05 20 16 24 CC Roger. Copy. And your longitude and the next block under 0944 Baker: the longitude is minus 1649; if you just verify that. And the longitude in the next block is minus 1640.

05 20 16 43 CMP Roger. Verify both of those.

05 20 16 45 CC Okay. Real good. And we'll see you over Carnarvon at about 43.

05 20 16 51 CMP And, Houston, Apollo 9. I'd like to have a map update.

05 20 17 08 CC Okay. We've lost you, Apollo 9. We'll see you at Carnarvon at 43. We'll have your map update.

CARNARVON (REV 89)

05 20 46 01 CC Apollo 9, Houston through Carnarvon. And I have a map update.

05 20 46 08 CMP Okay. Just a minute, Houston. We'll copy down.

05 20 46 13 CC Roger.

05 20 46 36 CMP Okay, Houston. Go ahead with the map update.

05 20 46 39 CC Okay. Map update. You're on REV 89; time, 141 17 38; the longitude, 123 degrees west; and if you want to use the star chart there, you're right ascension 1614.

05 20 47 08 CMP Okay. REV 89; 141 17 38; 123 west. Thank you.

05 20 47 14 CC Roger. And we'd like to have the H₂ tank 2 fan off at this time.

05 20 47 23 CMP Roger. H₂ tank 2 fan off.

05 20 47 28 CC That's affirmative. And in regard to the question about the interior film, just a couple of thoughts. You've probably got as good an idea as we have, but if you want to take some of the CO₂ filter change on that couch folding and stowage - that's about the only two items we can kick in at this time. And the - the hatch during the daylight sometime when you've got the S065 out of it, while the sun angle's changing on it.
9-

: (ooss l) Tam 90/5

/5

5

5

2

05 20 48 07 CMP

Okay. We also have a lot of exterior film. We have about four rolls of exterior film, and we're going to take some pictures of the ground. I just wondered if you had any particular subjects on the ground that you wanted a picture taken of. We'll probably put the 75mm lens on it and let it run for awhile.

05 20 48 24 CC

Okay. We'll work on that. And we're wanting you to keep, if possible, some of that 368 film and take some photographs during entry, if you want to kick that one around.

05 20 48 39 CMP

Roger. We already have planned for that, and we have four or so rolls of film in addition to that one.

05 20 48 46 CC

Okay. Real good; and we'll see if we can think up some good subjects.

05 20 48 52 CMP

All right. How about the beach of the Riveria?

05 20 48 58 CC

Hey! That'd be good.

05 20 48 22 CC

Apollo 9, Houston. We'll be dropping Carnarvon and picking up Honeysuckle in about one minute. S-band up.

05 20 48 30 CMP

Okay. Fine.

05 20 51 19 CC

And, Apollo 9. We get you through Honeysuckle in about 7 minutes.

HONEYSUCKLE (REV 89)

05 20 57 14 CC

And, Apollo 9. We're losing Honeysuckle. We'll see you over Mercury in about 5 minutes.

MERCURY (REV 89)

05 21 03 37 CC

Apollo 9, Houston through Mercury. Have you about 7 minutes.

05 21 03 41 LMP

Okay, Houston.

05 21 03 56 LMP

Hey, Smokey! I've got a good one for you here.

05 21 03 59 CC

Okay. Go ahead.
right ascension declination where the gegenschein is.

Hey. That sounds great. By gosh, we'll locate the gegenschein.

Okay. We'll try and identify it after you locate it.

Okay. Very good.

Hey, Houston, 9.

Go ahead, 9.

I've got some gyro torqueing angles for you for the nominal on the time, and we'll do a realign, if you like, on the next pass, also, after you update the state vector. We went through a P52 just to check out the optics, and, if you've got a pencil, I'll give you the numbers.

I'm standing by to copy.

Okay. GET of 140 57 00, plus 00630, plus 00557, minus 00093. And looks like the telescope's working okay this morning.

Roger. I copy your times and copy the bit about the telescope. Real good.

So far.

Roger. Understand.

And, Apollo 9, Houston. We would like to start a charge on battery Baker at about 141 plus 25, and we will be putting about 5 AMP-hours back in it.

Okay.

Roger. Battery charge on Bravo at 141 25.

That's right. Thank you.

Apollo 9, Houston. 1 minute LOS. We'll see you through Texas about 24.

All right.

Apollo 9, Houston. I have the right ascension declination on gegenschein.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 21 10 07</td>
<td>CMP</td>
<td>Okay. Go ahead.</td>
</tr>
<tr>
<td>05 21 10 08</td>
<td>LMP</td>
<td>Okay. Go ahead.</td>
</tr>
<tr>
<td>05 21 10 09</td>
<td>CC</td>
<td>Roger. 11 hours 16 minutes and plus 4 degrees.</td>
</tr>
<tr>
<td>05 21 10 17</td>
<td>CMP</td>
<td>Okay. 11 hours 16 minutes and plus 4 degrees. Thank you.</td>
</tr>
<tr>
<td>05 21 10 21</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 21 10 27</td>
<td>CMP</td>
<td>That's pretty fast gegenschein computations.</td>
</tr>
<tr>
<td>05 21 10 31</td>
<td>CC</td>
<td>Thank you.</td>
</tr>
</tbody>
</table>

END OF TAPE
Apollo 9, Houston. We've got you through the Texas sight. You're coming up on the lower end of Mexico.

Roger. Just about time to take some pictures of it.

Okay.

Apollo 9, Houston. At your convenience, we'd like to have POO in ACCEPT for a state vector.

Roger. Got POO in ACCEPT.

Okay. And anytime at your convenience - no hurry - I've got your landmark tracking updates.

Okay. Just a minute.

Houston, Apollo 9.

Go ahead. Apollo 9, Houston.

Roger. You can go ahead with your update.

Okay. I'll be giving you four sites here. This is a landmark tracking update: 021 142 56 1700, and this one is 2 miles south of track. Your next ID: 207 143 14 5800, and this one is 30 miles south of track. Your next ID: 010 144 26 1900, and this one is 60 miles south of track. Your last one: 042 144 34 0400, and this one is 13 miles north of track. End of update.

Roger, Houston. Do you read Apollo 9?

That's affirmative, Apollo 9.

Okay. I've just been having some trouble getting you on this mike. Okay. The first landmark is 021 142 56 1700, 3 miles south. Next is 207 143 14 5800, 30 miles south. Next one is 010 144 26 1900, 60 miles south - that's 60 miles south. Next one, 042 144 34 0400, 13 north of track.

That's affirmative, Apollo 9. Houston confirms the update.
05 21 30 59 CMP Roger.

05 21 31 05 CC And, Apollo 9, this is Houston. We can't uplink at this time. Would you clear the DSKY and then give us the ACCEPT again?

05 21 31 13 CMP Roger.

05 21 31 23 CMP Okay. Go ahead.

05 21 31 24 CC Okay. We'll try shifting it.

05 21 31 34 CC And, Apollo 9, Houston. I have a NAV check to go along with the state vector.

05 21 31 42 CMP Okay. Go ahead.

05 21 31 44 CC Roger. Reading NAV check. 142 16 4400, minus 2902, plus 09800 1137. And under comments: Good morning from your smiling FIDO and GUIDO.

05 21 32 17 CMP Roger. Under comments: Good morning to them. And my little old' NAV check is 142 16 4400, minus 2902, plus 09800 1137.

05 21 32 35 CC Roger. Houston confirms the update.

05 21 32 39 CDR I didn't realize FIDO's and GUIDO's smiled.

05 21 32 46 CC Yes. They been smiling pretty good.

05 21 32 50 CDR Alrighty.

05 21 32 54 CDR How's RETRO doing? Does he still look worried?

05 21 32 59 CC Roger. Copy.

05 21 33 08 CC And, Apollo 9. RETRO's only comment: said he would smile if he knew exactly where all that stuff was located.

05 21 33 16 CDR Okay. Listen, tell RETRO I haven't forgotten him. The thing that I told him yesterday still applies. Everything is right where we said it was yesterday, but we are going to have to move it around. And ask him when he needs to have that information for an entry.

05 21 33 32 CC Okay. We'll do that.

05 21 33 39 CC And, Apollo 9, Houston. The computer is yours. You have state vectors in both slots.
(GOSS NET 1)  

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05 21 33 45  CMP  Roger. Thank you.  
05 21 35 04  CC  Apollo 9, Houston. We are recommending Charlie and Delta AUTO RCS select switches OFF, and Alfa ON.  
05 21 35 16  CMP  Say that again, Houston.  
05 21 35 18  CC  Roger. We are recommending Charlie and Delta AUTO RCS select switches OFF, and Alfa switches ON.  
05 21 35 29  CMP  Okay. You want Alfa, Charlie, and Delta OFF.  
05 21 35 33  CC  That's a negative. We want Charlie and Delta OFF, and Alfa ON.  
05 21 35 38  CMP  Okay. Roger. All I have on right now are B - Baker.  
05 21 35 45  CC  Roger. Copy. We confirm.  
05 21 35 52  CC  And, Apollo 9, you can go back to BLOCK at your convenience.  
05 21 36 49  CC  Apollo 9, Houston. We'd like to start a charge on battery B at your convenience.  
05 21 36 57  CMP  Okay. We're going to start charge on BATT B now.  
05 21 37 01  CC  Okay.  

CANARY (REV 90)  

05 21 47 27  CC  Apollo 9, Houston. One minute LOS Canaries. We will see you at Carnarvon at 17.  
05 21 47 39  CMP  Roger, Houston.  

CARNARVON (REV 90)  

05 22 17 09  CC  Apollo 9, Houston through Carnarvon. Standing by. We'll have you about 6 minutes.  
05 22 17 14  CMP  Roger, Houston. We have a question here on the fuel cell purge this morning. I take it that you want us to do a hydrogen purge as well as an oxygen purge this morning?
Roger. That's affirmative, Apollo 9.

Okay. Fine. We'll start that right now.

And, Apollo 9, Houston. I've got a couple of targets of opportunity here we'd like to shoot with the 16mm.

Okay. Stand by. We'll copy that down in just a second.

Roger. No problem.

Okay, Stu. Go ahead with those targets.

Okay. The first one here in a thunderstorm over West Africa. We'd like to have you to start the exposure at 11/4 plus 55 plus 45. You'll be shooting northeast of the ground track. Let it run 5 minutes at 1 frame per second. Use the 16mm camera with the 75mm lens and the film CEX 358.

Okay - Excuse me - 11/4 55 45, thunderstorm West Africa, northeast of ground track, 1 frame a second, 16mm camera CEX with a 75, CEX 368 with the 75mm lens.

That's affirmative. And your other one is at GET 152 06 08 using the same camera, same lens, and shooting S0368 film. We would like to have you shoot southwest of ground track for 5 minutes at 1 frame per second, and this is Hawaii. Now, it's about a 300-mile range, but the purpose of this second one is to study the effects the islands have on the weather and jet stream and so forth.

Okay. Would you say again how long you want it to run from the time, Stu?

Okay. Five minutes at 1 frame per second. You're shooting southwest of the ground track.

Okay. Right. 152 06 08, same camera lens and film, southwest of ground track for 5 minutes, and we're photographing the weather formations and stuff around Hawaii.

Okay. On the film, in this second one over Hawaii, we'd like to have - The film is S0368.
05 22 21 40  LMP  Yes. That's CEX 368, same thing.
05 22 21 44  CC   Okay. I didn't do my homework.
05 22 22 07  CC   And, Apollo 9, you are GO for 108-1. We'll be picking up at Honeysuckle in about 2 minutes with S-band volumes up.
05 22 22 19  LMP  Okay.

HONEYSUCKLE (REV 90)

05 22 26 39  LMP  Houston, Apollo 9.
05 22 26 40  CC   Go, Apollo 9.
05 22 26 46  LMP  Roger. Do we assume that on all these targets of opportunity that these are zero fuel opportunities?
05 22 26 57  CC   Roger, Apollo 9. Copy. Stand by.
05 22 27 14  CC   Apollo 9, this is Houston. What we'd like to do, as we've done it here, is give you the data early and let you - if you can just move over there real slowly and get in that area so that you can photograph it. But just minimum usage is the way I'm wanting to term it.
05 22 27 41  LMP  Okay. Understand. Minimum usage on that.
05 22 27 51  CMP  Houston, Apollo 9. Did you get the gyro torquing angles that time?
05 22 27 58  CC   Apollo 9. Stand by.
05 22 28 06  CC   That's affirmative; we got them, Apollo 9.
05 22 28 09  CMP  Okay. Thank you.
05 22 28 12  CC   Roger. Thank you.
05 22 30 13  CC   Apollo 9, Houston. One minute LOS Honeysuckle. See you Mercury 37.
05 22 30 18  LMP  Roger.
05 22 30 38  CC   And, Apollo 9, Houston. No need to answer this, but USC beat UCLA last night, 46 to 44.
(GOSS NET 1)

05 22 30 49  CDR  Wow! Say, isn't that something!
05 22 30 55  CC  Yes. That's the second loss in 90 games.

MERCURY (REV 90)

05 22 37 21  CC  Apollo 9, this is Houston through Mercury. Standing by. I'll have you about 5 minutes.
05 22 37 26  CMP  Roger.
05 22 41 44  CC  Apollo 9, Houston. One minute LOS Mercury. Redstone 50.
05 22 41 50  CMP  Roger, Houston.

REDSTONE (REV 90)

05 22 52 07  CC  Apollo 9, Houston. We have you; good solid lock now. Standing by.
05 22 52 12  CDR  Roger. Houston, Apollo 9.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1) Tape 92/1
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GUAM (REV 90)

05 22 55 13  CC  Apollo 9, this is Houston. Did you call?
05 22 55 16  CMP  Negative. Houston, Apollo 9.
05 22 55 18  CC  Okay. I'm sorry.
05 22 55 27  CMP  Houston, when you get a chance, you might give
                   us our inclination.
05 22 55 32  CC  Roger. Sure will.
05 22 55 43  CC  And, Apollo 9, this is Houston. Your inclina-
                   tion is 33.63.
05 22 55 49  CMP  Roger. Thank you.
05 22 56 27  CMP  Houston, Apollo 9.
05 22 56 29  CC  Go ahead, Apollo 9.
05 22 56 31  CMP  Okay. I'm wondering about the time on this par-
                   ticular landmark. I've got 142 56 17, and we're
                   past it already, and we are apparently not yet
                   near the landmark.
05 22 56 47  CC  Okay. That time should be when Corpus Christi
                   comes over the horizon.
05 22 56 54  CMP  Okay. Very good. I think Corpus Christi is com-
                   ing over the horizon.
05 22 56 59  CC  Okay.

TEXAS (REV 90)

05 23 01 46  CMP  Houston, Apollo 9.
05 23 01 48  CC  Go ahead, Apollo 9.
05 23 01 50  CMP  Okay. Same story; the telescope hung up again.
                   I went to the sextant and was able to find in
                   the sextant; took five Marks. So I have to pro-
                   ceed to do the program to see what they did, but
                   I got a l21 alarm, which is the same thing I got
                   yesterday when the telescope hung up. CDU's NO-
                   GO at the mark.
05 23 02 13  CC  Roger, Apollo 9. I was copying that alarm. We copied your info and understand you got five Marks on it with the sextant with no problem.

05 23 02 24  CMP  Roger. But I'm not sure the Marks went in, although it indicates that it did go into the program.

05 23 02 30  CC  Roger. Understand.

05 23 02 48  CMP  And, Dave, if you want any other time on these landmarks, just let me know. We can give you any time you want, when it's 30 degrees down or anything. The time we are passing you is the time that it'll snap over the horizon.

05 23 03 02  CMP  That's a fine time, Stu. We'll use that one; that's good.

05 23 03 06  CC  Okay. Very good.

05 23 03 07  CMP  It looked like I got one CDU NO-GO before I completed the Marks, because my second program alarm was MARKS NOT DESIRED. So apparently I got the Marks in all right. I don't know what the CDU NO-GO is going to do to it, but we'll take a look as we go through the program.

05 23 03 29  CC  Okay. Real good. Copied. Thank you.

05 23 03 32  LMP  Stu, I'd like the time - I'd like the time that we're going to be at the closest point to the target. It helps me judge the roll rate that I'm putting in here.

05 23 03 41  CC  Okay. We'll pass the time coming over the horizon and the time of closest approach.

05 23 03 48  LMP  Roger.

05 23 06 57  CMP  Houston, Apollo 9.

05 23 06 59  CC  Go, Apollo 9.

05 23 07 00  CMP  Okay. I guess none of the Marks got in that time. My DELTA-2 DELTA-V for the change in the state vector is zero, and I doubt if my first Mark was perfect. Also, my Mark counter is zero, so I guess we still got some sort of problem. We'll run through it again on the next landmark.
05 23 07 17  CC  Roger. Copy. You had a perfect Mark there, and evidently they didn't get in. Thank you.

05 23 07 24  CMP  Well, that's not exactly what I said, but it sounds pretty good.

05 23 07 29  CC  Roger. Well, I was just helping you out a little bit there.

05 23 07 32  CMP  Thanks. I'll take all I can get.

05 23 07 34  CC  Okay.

05 23 07 36  CMP  But we're learning how to do it, anyway.

05 23 07 40  CC  Roger. Sounds great. I thought you might have more trouble with the sextant than it sounds like you're having.

05 23 07 46  CMP  Well, I did too, as a matter of fact. But AUTO optics did pretty fair, and I could see where it was relative to the telescope on the AUTO drive. And then when I went to the sextant, it was pretty clear. Of course, Corpus Christi's not a hard thing to identify, either.

05 23 08 01  CC  Roger.

05 23 08 10  CC  Roger. We'll see how you make out here with punar-dumford.

05 23 08 15  CMP  Yes. That ought to be a trick.

05 23 08 16  CDR  Hey, keep it clean will you, Stu?

05 23 08 19  CC  (Laughter) Okay.

05 23 08 52  CC  And, Apollo 9, Houston. I have your time for closest approach on landmark 207.

05 23 08 58  CDR  Go ahead.

05 23 09 00  CC  Roger. 1+3 plus 18 plus 42.

05 23 09 08  CDR  Thank you.

05 23 09 10  CC  Roger.

05 23 09 11  CDR  You are absolutely a wealth of information, today. I can't believe it.
Boy! Wish I had this many people funnel me info all the time.

Houston, Apollo 9.

Go ahead, Apollo 9.

Roger. Since you located the Gegenschein for us, can you locate the Trojan point?

Roger. We'll go to work on the Trojan point.

Okay.

Hey, after you do that, could you find out who's going to win the NCAA basketball championship.

Roger. Couple of scores on the regional quarter finals. Davidson beat Villanova 75 to 61, and Miami of Ohio beat Notre Dame 63 to 60.

Listen, I'm not going to be able to live with my wife. You know she is from Miami.

Ah so.

And, Apollo 9, Houston. Ohio State beat Michigan 95 to 66.

Ah boo.

Listen, if Michigan got beat, Miami of Ohio won I'm in trouble when I get home.

Well, that's the way it shapes up unless we can fix the scores here.

Hey, you've fixed everything else so far, how about fixing that?

Roger. In work.

Rusty also wants you to get us a fix for the CCS's.

And, Apollo 9, Houston. You'll be getting a MASTER ALARM shortly. TCZ on fuel cell 2.

Okay. Thank you. We got it this time.
<table>
<thead>
<tr>
<th>Time</th>
<th>CDR</th>
<th>HOUSTON, APOLLO 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 23 20 22</td>
<td>CDR</td>
<td>Go ahead, Apollo 9.</td>
</tr>
<tr>
<td>05 23 20 23</td>
<td>CC</td>
<td>Roger. It went a lot better than time by using the point of time closest to approach. I'll let Dave tell you about the rest of it.</td>
</tr>
<tr>
<td>05 23 20 26</td>
<td>CDR</td>
<td>Okay. The telescope and sextant both seemed to work that time. I left the telescope early and went to the sextant, and I was able to track him all the way across the nadir and back off on the other side. And our roll rate was something like - I guess, 6/10 of a degree per second. It seemed to be real good. I took the Marks early, probably earlier than I should have, in order to get them before we had a problem. So next time, I think, it'll work out pretty good.</td>
</tr>
<tr>
<td>05 23 20 35</td>
<td>CMP</td>
<td>Roger. Sounds great.</td>
</tr>
<tr>
<td>05 23 21 03</td>
<td>CC</td>
<td>Your times, and everything - They are real good. And AUTO optics seems to be doing real good.</td>
</tr>
<tr>
<td>05 23 21 07</td>
<td>CMP</td>
<td>Okay. Copy. I'm going to lose you in about 30 seconds off Canary. We'll see you at Tananarive at 35.</td>
</tr>
<tr>
<td>05 23 21 20</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>CDR</th>
<th>TAMANARIVE (REV 91)</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 23 35 55</td>
<td>CC</td>
<td>Apollo 9, Houston through Tananarive.</td>
</tr>
<tr>
<td>05 23 35 59</td>
<td>CMP</td>
<td>Hello. Houston, Apollo 9.</td>
</tr>
<tr>
<td>05 23 36 01</td>
<td>CC</td>
<td>Roger. I have an update to your landmark tracking update.</td>
</tr>
<tr>
<td>05 23 36 10</td>
<td>CMP</td>
<td>Stand by one.</td>
</tr>
<tr>
<td>05 23 36 12</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>05 23 36 23</td>
<td>CMP</td>
<td>Okay. Go ahead with it.</td>
</tr>
<tr>
<td>05 23 36 25</td>
<td>CC</td>
<td>Okay. For landmark number 10, your next one coming up, your time of closest approach is 144 30 07. And now the east coast is overcast, so you're not going to be able to get your Carolina pass in there. Your fourth landmark will be number 212. The time over the horizon:</td>
</tr>
</tbody>
</table>
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14h 50 36 00; time of closest approach 14h 54 10.
And since we have moved it, we want to delete
that 16mm film of the thunderstorm over Africa.
We will get something on that later.

Okay, Apollo 9. Situation is normal here at
Tananaive. I'm not reading you, and we will
see you at Carnarvon at 51. We will still be
here for about another 3 minutes, but Carnarvon
at 51.

Roger. Houston, Apollo 9. Do you read?

Roger. Reading you loud and clear.

Okay. Landmark 212, north or south of track?

I'm sorry. It's 34 miles south of track.

Okay. Readback: 212 14h 50 36 34 south, closest
approach 14h 54 10. Closest approach for landmark
10 is 14h 50 07.

Roger. Your readback is correct. We are delet-
ing the 16mm film of the African thunderstorm.

Okay. Delete 16mm film.

Okay. And your readback is correct. Thank you.

And, Apollo 9, Houston. If you are still reading
me, there is a transducer that is slightly erratic
on your helium pressure on quad Baker. It will
not affect our gaging or our predictions. I just
want to let you know this in case you see some
funny readings.

Apollo 9, Houston through Carnarvon. Standing by.

Roger. Houston, Apollo 9.

And, Apollo 9, Houston. I have several comments
on how we are set up on this landmark tracking,
when you are ready to talk.

Okay, Smokey. One question first.

Go.
What was our GMT at liftoff?

Okay. We'll get it.

Okay. Thank you.

And could you give us POO in ACCEPT? We'd like to uplink you a state vector.

Roger. POO in ACCEPT.

Understand. POO in ACCEPT.

And, Apollo 9, Houston. Time 16 plus 00 plus 01.

Roger. 16 plus 00 plus 01. Gee, we were a little late.

Yes. Just a tad there. And, Dave, there are a couple of comments about this NOUN 71 setup, and a couple of other things I'd like to talk with you.

Roger. Go ahead.

Okay. Your Mark counter will not update in this P22. Now we have a display on it, and we are showing that your Marks are getting in. We show 5 on the first pass just as you stated. And so that's one thing that you can expect. Okay. Under NOUN 49 your DELTA-R DELTA-V is going to read zero in this P22. And the reason for this is the W-mark is initialized to accept Marks for LAT, LONG, and altitude only; so you're going to see zero on the DELTA-R DELTA-V.

Okay. That was a real puzzler. We've been sitt here trying to figure out why that didn't give us anything, and we were absolutely stumped.

Okay. Now one other thing. Down here - I'm loo ing at your procedures book - under your NOUN 71 where it says that your last two digits can either be 00 or C1 for earth orbit, we should restrict that to 00 for earth orbit. It's not set up to accept that lunar landmark stowage. So we'd like to have that NOUN 71 as either 10 000 or 20 000, and since we're working on known landmarks, we're saying 10 000.
Okay. I understand that. I was planning not to use that 01 anyway, because we weren't going to the same landmark. But okay; we'll use 10 000 all the way through.

Okay.

And, Apollo 9, let's bring up S-band volume. We'll be seeing you at Honeysuckle here within a minute.

Apollo 9, this is Houston. The computer is yours. I have a NAV check to go along with the state vector. You have been uplinked state vectors in both slots.

**HONEYSUCKLE (REV 91)**

Apollo 9, this is Houston. I should have you at Honeysuckle. Do you read?

Apollo 9, this is Houston. I should have you through Honeysuckle now. The computer is yours. I have a NAV check to go along with the state vectors that have been uplinked.

Roger. Stand by just one.

Roger.

Okay. Go ahead.

Roger. Reading NAV check: 144 05 0069, minus 2027, plus 16071 1177. End of update.

Roger. Readback: 144 05 0069, minus 2027, plus 16071 and 1177.

That is affirmative. Houston affirms the update. And did you talk to me over Tananarive about your pressure transducer on quad Baker?

Roger. We did.

Okay. And one other comment. The 121 alarm that you got back there, Dave, is not connected with the optics problem.

Okay. Thank you. What is it connected with?
Well, everybody here agrees that it is not unreasonable to see that that alarm is a reasonable test on the CDU's; and at the time you sampled it, it flashed you that. But it's not connected now with the sticking of the optics.

Okay, maybe all this will make sense in a couple of more revs.

Roger. And that alarm is the platform CDU's, Dave. I guess that will clarify for you.

Okay. Well, I just had a quick gouge up here on the alarms and CDU's, and it didn't specify.

Roger. Understand. I was thumbing through my book here trying to see what the alarm was. I was watching you go through that, but I've got a couple of more rooms of brains back here that you don't have.

It's nice to have them back there, isn't it?

Boy, it sure is.

Apollo 9, Houston. We are about to lose you at Honeysuckle. I see you working on your realignment there. We'll see you at Huntsville at 06.

HUNTSVILLE (REV 91)

And, Apollo 9, Houston through Huntsville. Standing by. And I'm real curious how old Jupiter worked out.

And, Apollo 9, Houston through Huntsville. Standing by. We'll have you about another 3-1/2 minutes.

Say again. Houston, Apollo 9.

Roger. We've got you at the Huntsville now. Should have you for about another 3 minutes; and I'm curious how old Jupiter went.

Say again about Jup --

--- Roger. How did the alignment go on Jupiter there?
We're still tracking him down, here.

Okay.

We just found him.

Hey, Smokey. Is this the ninth?

Hey, that's affirmative. It is the ninth.

Thank you. Sort of lost track here.

Roger. I can understand that.

Apollo 9, Houston. See you at Hawaii 18.

Roger.

Apollo 9, this is Houston through Hawaii. Standing by.

Roger, Houston.

And, Houston. The P52 with Jupiter didn't work out very well. I stuck in the numbers I had in the checklist for the days we asked you to check on and got about a 67-degree star-angle difference. And I used Jupiter and Crux, which are pretty familiar figures, so we'll have to regroup on that one.

Roger. Copy. Understand.

And we did not torque the platform, by the way.

Good thinking. And show you - about 7 minutes, old Punta Willard ought to be coming over your horizon.

Okay.

Houston, Apollo 9.

Go ahead, Apollo 9.
Houston, this is Apollo 9. You are still around, aren’t you?

Apollo 9, Houston. Say again.

Roger. Houston, Apollo 9. Had a little trouble with the clouds that time. I wasn’t able to recognize it until we got about 30 seconds from overhead, and then I’m not sure because of the cloud cover. But I got three marks with the sextant, and the AUTO optics seemed to work pretty good.

Roger. Copy. And that roll alarm, we feel, at that time was caused by the roll rate.

Okay. Very good. And you just about have to have that kind of roll rate to stay on it with the sextant.

What’s the roll rate limit that causes that?

We’re working on that right now.

Houston, Apollo 9.

Go ahead, Apollo 9.

Did you get my question about what roll rate causes the CDU warning light to come up?

That’s affirmative, Jim. We’re working on that. We’re trying to find out what limits you have in there now, and, also, maybe be able to change it - change the limit. And just for your info, too, when you get that alarm, it will reject that Mark. It won’t accept it with that Mark, so we’ll try to have you a roll rate limit here.

Okay, Stu. Just as you say. Just for your information, you cut out. What was for my information?

Okay. What when it flashes that CDU alarm, it will reject that Mark.

Okay. It rejects one mark, but not the whole string of Marks; is that right?

That’s affirmative.
Okay. Thank you.

And, Stu, I got another question on this new program we're working with here. It doesn't seem to allow us to proceed out of the flashing 51 as we do in the other programs.

Okay. I copy. We'll try to get you an answer.

Okay.

Hey, Houston. This is Apollo 9.

Go ahead, Apollo 9.

Hey, did all that work that Dave did on his 52G last night fix it?

That's affirmative. It's coming through loud and clear, and the surgeon says, "Thank you."

Dr. Scott appreciates his thank you.

Roger.

I've been thinking of looking for a new job.

The surgeon says they'll put you to work.

They've been doing that for several years.

Very good.

And, Apollo 9, Houston. I can just see the headlines now: "Scott Quitting Space Program."

Yes. I hope we see those, huh?

Yes.

All right, you guys.

And, Apollo 9, Houston. Dave, you could proceed on that flashing 51, if you could get one valid Mark into the computer. But that's what's hanging up on the flashing 51 there.

Okay. Well, I thought I got a couple; I got three there, and I didn't get the program alarm. I don't think --
Okay. We'll check that. --

Okay. .... --

The info I had was --

... I was looking through the tube there and didn't see the ... we got on the first one.

Okay. And we did see the three alarm.

Okay. We'll slow down the roll rate.

VANGUARD (REV 92)

Apollo 9, Houston.

Go ahead.

Okay. I guess you've got somebody eyeing the middle gimbal, and I realize that it's less than 6 minutes before 7:12 is coming over the horizon. We can go into the erasable memory with the address I can give to you, and we can double the rate that's in there. Right now it's six-tenths of a degree CRU rate. Now we don't have that info translated into a body rate, yet.

Okay. Why don't we just go slower on this one, Houston, and not try and do that now, because we are coming up on the target. And I think - You know the summation of all this is - It's probably designed for the lunar orbital case where you have a lot more time and you're going a lot slower. That's probably what the problem is.

Roger. That's - We understand and concur with not changing it. We don't have to let out - I thought we might want to try it on this last one here today. And really, we're proving the technique; sounds like you've really got the technique swinging.

Oh, yes. And I'm surprised even the sextant is as easy as it is. Once we get the high spacecraft rates it's pretty easy to track it with the sextant.

Stu, if we do any of these things tomorrow, we might jack up the rate in that erasable load.
(GOSS EXT 1)

06 00 47 44  CC  Okay. Real good, Jim.
06 00 48 21  CMP  And, Houston, on this next right pass, we'll do that P52 to Jupiter again.
06 00 48 28  CC  Roger. Understand. Maybe by then we'll have somebody look at those half unit vectors and...

CANYAR (REV 92)

06 00 52 49  CMP  Houston, 9.
06 00 52 50  CC  Go ahead, 9.
06 00 52 52  CMP  Roger, Houston. Have you got into degrees per second yet?
06 00 52 57  CC  That's negative. I'm sorry; we don't have it.

TANANARIVE (REV 92)

06 01 09 11  CC  Apollo 9, Houston through Tananarive.
06 01 09 28  CC  Apollo 9, this is Houston. I am not reading you. I may be coming through to you. If so, on the P52 alignment, I'd like to have you check the unit vectors for Jupiter on the last page of section 7.
06 01 10 04  CMP  We got the numbers on that.
06 01 10 08  CC  Okay, Apollo 9. I got that transmission.
06 01 12 16  CC  And, Apollo 9, this is Houston. Our VHF is pretty bad. I'm going to wait until over Carnarvon to give you your 0655 PAD; and that will be Carnarvon about 24.

CARNARVON (REV 92)

06 01 25 23  CC  And, Apollo 9, Houston through Carnarvon. How do you read?
06 01 25 28  LME  Five-fly, Houston.
06 01 25 30  CC  Okay. I hate your 0655 PAD.
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06 01 25 34 IMP Roger. Ready to copy.

06 01 25 37 CC Okay, I'm going to give you your inertial angles first: 18000 07320 all zips 145. I'm giving you now the GST; I'll give you your ORB angles in a minute. I'm now on the GST: 145 57 00. This is ORB RATE. Your first area is the Salton Sea: 146 02 21 08 06. Your second area is in New Mexico: 146 01 59 08 03. The next area is the Mississippi River: 146 08 07 08 04. And your ORB RATE is 0.068. And now on your ORB RATE angles: I'm not sure - I think this is what you were wanting, Jim, but you're reading 180 degrees of roll, and with the local vertical, you are 32-1/2 degrees below the local horizontal.

06 01 27 43 LXP Stu, I think that we're probably pitch down there 32. Would you confirm that?

06 01 27 48 CC That's affirmative. You're pitch down 32-1/2 degrees below the local horizontal.

06 01 27 57 IMP Okay.

06 01 28 04 IMP Okay. Readback, then: 18000 07320 all zips 145 57 00; ORB RATE. First area, Salton Sea: 146 02 21 08 06. New Mexico, second site: 146 04 59 08 03. Mississippi River: 146 08 07 08 04. ORB RATE is 0.068, and the orbit to level vertical angle would be 180 and whatever 360 minus 32 is, and zero.

06 01 28 48 CC That's affirmative. I confirm that, and we have interpolated off of that chart there. We want to save you all the mental gymnastics to get your VWXY parameter.

06 01 29 06 CMP All right. Go ahead.

06 01 29 07 CC Okay. You want me to read those then? Is that affirmed?

06 01 29 14 IMP Stand by just one.

06 01 29 16 CC Okay.

06 01 29 42 LXP Okay. Go ahead, Smokey.

06 01 29 44 CC Okay. Reading: V as in Victor, 77775; W as in Whiskey, C331; X as in X-ray, all zips; Y, 65732; and then Zulu, 9442.
Okay. Got 7775, 41331, all zips, 69372, and 54242.

Okay. And the order of that is V, W, Y, Z.

Roger. We got that. Flight B chart is onboard. That even agrees with the Z-component of preflight calculation. Okay. Thank you very much.

Roger.

Okay. I can give you a quick rundown on Jupiter, now that we've done it.

Okay.

We're about 10 seconds to LOS here. We'll catch you over the Huntsville at 30.

Okay. Very good.

HUNTSVILLE (REV 02)

Apollo 9, Houston through the Huntsville. Standing by.

Roger. Houston, Apollo 9. How do you read?

You're coming in loud and clear, Dave.

Okay. Stand by a minute, and I'll give you a rundown on Jupiter alignment.

Roger. We've taken a look at some of the data, and it looks swell.

Roger. And I've got a couple of comments on it; just a second. Okay. ... I ran it two times to get some repeatability on the numbers we had to put in; in the star angle difference was 0.04 on the first one and 0.03 on the second one. And did you get the torquing angles?

That is affirmative, Apollo 9.

Okay. It seems to work real well. The planet fills up the whole inside of the reticle in between the reticle lines. It's about the size of the - gives you about 40 old records ... and one thing was noticed in the program is that when you load those unit vectors for the planet and then let
AUTO OPTICS drive do it, then take the Marks, the Mark wipes out the load that you put in, and you have to reload those unit vectors again. Now that might be an early thing for you might care to think of in Canaveral, because it takes a lot of time to reload those vectors.

Roger, Dave. Copy. A real good observation.

And, other than that, it works real well. The torquing angles were small, and the planets were easy to find. I think that'd be a fine thing to use if you couldn't see the stars in the daytime.

Hey, that sounds real great, and that was an extremely good summary.

And on the last Canaveral track, I think we got the hang of the whole thing. We had cloud coverage again, and we had to reject the first part because I just couldn't see it clearly. We got almost overhead, and I got two real good Marks. I think we've got that one nailed and can get a clear target load.

Okay, Dave. Understand.

... and we're getting ready for S065 right now.

Real good.

And if you've got time for a question, Dave, just help me out. Jim asked specifically for this yesterday, that the ORB RATE angle - and to make sure that I'm giving you what you want - Is that what you want, your relation to the local vertical?

Roger, Stu. We have what we want here.

Okay. Real good.

We wanted the inertial angles to maneuver to, and we wanted the relative local vertical ... attitudes to stay at.

Okay. Real good. Well, we will flip it to you.

Houston, Apollo 9.

Go ahead, Apollo 9.
One thing I forgot to mention on that alignment, the way we got the unit vectors was to interpolate between the times that we had on the charts on board, and so we tried to take the five-digit numbers and get as close as we could to the time - the CPT that we had right now. So I guess we - The repeatability really is a function of those numbers that you had there - that we had on the chart ... and that we interpolated with.

Okay, Dave, understand. We're about 1 minute 12 or 13 minutes to Honolulu. We'll see you Hawaii in about 5 minutes at 10.

49 Hawaii.

HAWAII (REV 92)

Apollo 9, Houston through Hawaii. Standing by.

Roger.

REDSTONE (REV 92)

Apollo 9, Houston.

Houston, Apollo 9. We're with you.

Okay, Apollo 9. Looks like we are about to make a mistake here. I've got to give you new numbers. You read the ones we gave you, but those aren't right. We have got to use the complement of those. Are you ready to copy?

Roger. Go ahead.

Roger. 00 002 16 446. Stand by.

Okay. And X is all zips; Y, 12045; and Z is good as is. I'm sorry about that.

No sweat. We'll get it.

I thought I had them signed in blood.
(GOSS NEW 1)

06 01 55 30 CM: You watch those as they go in. Okay?

06 01 55 32 OK Okay. We're watching.
06 02 09 01  LXP  Houston, Apollo 9.
06 02 09 03  CC  Go ahead, Apollo 9.
06 02 09 05  CXP  Roger. We just completed the 5065 pass.
06 02 09 10  CC  Roger. And how did the cloud cover look?
06 02 09 13  CDM  Really neat. There weren't any clouds all along the way. It looked very, very nice.
06 02 09 18  CC  Oh, real good. And we noticed you're torquing the right way, and we just about fooled you up there.
06 02 09 24  CDR  Hey, but you didn't. You're right on time. That's very good. You're putting a little drama into the game, Stu.
06 02 09 31  CC  That's right. We've got everybody awake, anyway.
06 02 09 40  CDR  Say, you know on this ORB RATE torquing, I don't think we had a jet firing the whole time after it started the rates going.
06 02 09 49  CC  Roger, G&C says there were very few of them, but there were some.
06 02 09 54  CDR  Okay. We just didn't hear any of them go, and it seemed to be real smooth.
06 02 09 58  CXP  Yes, we went to FREE some time ago, and we're still at an inertial altitude of 328.
06 02 10 07  CC  Very good.
06 02 11 23  CDR  Houston, Apollo 9 ... That was a most enjoyable trip across the States, there.
06 02 11 30  CC  I'm sorry, Apollo 9. I didn't catch it. Say again.
06 02 11 34  CDR  Roger. I said that was a most enjoyable trip across the United States.
06 02 11 38  CC  Roger. Copy.
Apollo 9, Houston.

Go ahead.

Roger. I'd like to read you a little blurb out of the newspapers here. It's - byline Newark, New Jersey. "McDivitt honored. The ancient order of hibernians, representing 250,000 Irishmen across the country, voted Saturday to honor Apollo 9 Astronaut James A. McDivitt for his achievements. The executive board of the hibernians voted unanimously" - stumbles over that one - "to award McDivitt the John F. Kennedy Medal for National Civic Service. McDivitt will receive the medal at the hibernian dinner in Newark on May 10th, a spokesman said."

Roger. I wish to thank my fellow hibernians for that honor. And you might also mention that I am flying with green handles on my seat.

Okay. Copy.

Apollo 9, Houston. Good afternoon. Through Ascension.

Houston, Apollo 9.

Roger. Loud and clear this time, Dave.

Okay. I've got some gory torquing angles for you.

Roger. Ready to copy.

Okay. A GET of 146 27 00, plus 00100, minus 00050, plus 00006.

Roger. We copy. Thank you.

Roger. See you pretty good in the daytime.

Yes. Amazing what it's like in the daytime.
Roger.

Apollo 9, Houston. One minute LOI; Transarive at 14.

Roger.

**CARNARVON (REV 93)**

Apollo 9, Houston through Carnarvon with your S065 update.

Roger, Houston. All set to copy. Stand by; my pen's not there.

Roger. Standing by.

Roger. Got the pen now.

Okay. I'll give you inertial angles first: 18000 25280 and all zips. Your ORB RATE ball angles: 180, 327.5, and zero. Your GST: 147 30 27; NA on your V align; you'll be ORB RATE; the rate is 0.068. The first sight: Salton Sea, 147 35 40 08 05; Tucson, 147 37 12 06 09; Matagorda will be a site: 147 40 42 06 03. I can go ahead and give you your ORB RATES for loading the DAP. I'll give them Victor through Zulu. Victor, 00002; Whiskey, 16446; X-ray, all zips; Yankee, 12045; Zulu 54142; and you can read back if you want to.

Okay. Coming back in the same order, Ron. 18000 25280 all zips; 147 30 27; NA; ORB RATE 0.068. Salton Sea, 147 35 40 08 05; Tucson, 147 37 12 06 09; Matagorda, 147 40 42 06 03; I guess I forgot the vertical angles: 162 327.5 0. And then, going on Victor through Zulu, 00002; 16446 all zips 12045 54142.

Roger. Your readback is correct. And I've got your points where Achilles chased Hector around the walls of Troy.

Okay.

First point: right ascension, 12 hours 10 minutes; declination, minus 1 degree. Second point: right ascension, 19 hours 50 minutes; declination, minus 26 degrees.
Okay. 12 hours 16 minutes, minus 1 degree; 19 hours 19 minutes, minus 76 degrees.

Roger. And that will be at GBT of 140 plus 00.

Okay. By the way, looking for the Gogenschein. I was sort of all dark-adapted on the pass that I have marked on Jupiter and was not able to see anything.

Roger. By Gogenschein.

9, Houston. On your pass over Ascension we noticed the surge tank was dropped about 100 pounds, and then it's coming back up. Was this filling the HREPSS?

Roger.

Roger. Thank you.

We may give it a couple of more shots here just to tweak it all the way up.

Roger. Concur.

Apollo 9, Houston. Thirty seconds LOS; Guam at 11.

Roger.

Apollo 9, Houston. Two minutes to LOS; Hawaii at 23.

Roger.

Apollo 9, Houston. Standing by through Hawaii.

Roger, Houston. Apollo 9.

Roger.
(GOSS NET 1)

06 03 50 25 CC Houston. Go.

06 03 50 26 CDR Could you find out how many frames are on those small 70-millimeter Hasselblad film packs? I think there's 60, but I'm not really sure.

06 03 50 35 CC Roger. We'll check it.

06 03 50 37 CDR I know that there's 150 in the big ones, but I don't know what there are in the little ones.

06 03 50 42 CC Roger.

06 03 50 55 LGO Ron, I think they are in MAGS F and G.

06 03 50 59 CC Okay. MAGS F and G.

06 03 51 15 CC Apollo 9. Houston.

06 03 51 17 CMP Go.

06 03 51 16 CC Roger. You can terminate HALT A charge, and if you do it after 52, just let us know the time at Ascension.

06 03 51 26 CMP 3, 2, 1.

06 03 51 23 CMP MARK.

06 03 51 30 CC Roger. We got it.

06 03 52 06 CC Apollo 9, Houston. About 30 seconds LOS. And you have a GO to chlorinate prior to sleeping tonight, if you want.

06 03 52 15 CMP Okay; fine. Thank you. We'll do that before we go to bed.

06 03 52 17 CC Roger.

ASCENSION (REV 94)

06 04 01 19 CC Apollo 9, Houston through Ascension.

06 04 01 22 CDF Hello. Houston, Apollo 9.

06 04 01 25 CC Roger. Looks like you have 65 frames in these small 70-mm packs.
06 04 01 32  CDR  Okay. Very good. Thank you.

06 04 01 39  CC  And, 9, Houston. Looks like our cryo plan is about the same as last night. If you still have that one, it is the same - unless you want me to read it up again and remind you.

06 04 01 54  CDR  No, I believe it's to turn the heaters and fans off now, and let the hydrogen pressure drop down to between 190 and 200. And then, just before we go to bed, we're going to turn H₂ fan number 2 on.

06 04 02 06  CC  Okay. We'll use number 1 fan tonight. H₂ tank 1 fan ON just before you go to bed.

06 04 02 12  CDR  Okay. H₂ tank 1 fan ON just before we go to bed.

06 04 02 16  CC  And we'll - Put inverter 3 on MAIN A just before you go to bed.

06 04 02 22  CDR  Okay. And we've been running all day long without either heaters or fans on the H₂, and tank 1 is reading about 208 or so, but tank 2 is all the way up to 220. We're going to have to do a lot of purging to get it down.

06 04 02 44  CC  Roger. If a purge is required, which it looks like it may be, go ahead and purge fuel cell 2.

06 04 02 52  CDR  Okay.

06 04 03 13  CDR  And, Houston, this is Apollo 9.

06 04 03 15  CC  Houston. Go.

06 04 03 17  CDR  On our powerdown, do you want us to just power down the things we powered down last night, and not power down completely?

06 04 03 22  CC  Affirmative. That'll be SCS electronics power OFF, the A510 RCS switch is OFF, rate control power switch is OFF, and the translation control power OFF. The rest of them - powered up.

06 04 03 28  CDR  Okay. Very good.

06 04 03 53  CC  9, Houston.
(GSS NET 1)

06 04 03 57 CDR Go ahead.
06 04 03 58 CC Roger. We wanted to get a couple of frames for hydrology and oceanography there in Matagorda.
06 04 04 06 CMP Oh, very good. Well, that's what you got.
06 04 04 10 CC Okay.
06 04 04 16 CC Apollo 9, Houston. We're coming up on LOS. Low pass at Sanmarive and Carveron; probably Guam at 42.
06 04 04 25 CMP Alrighty.

GUA M (REV 94)

06 04 42 52 CC Apollo 9, Houston through Guam.
06 04 42 55 CMP Roger. Houston, Apollo 9. Go.
06 04 42 58 CC Roger. Request an E memory dump, VERB 74, when you get a chance. And, give us a Mark.
06 04 43 05 CMP Roger. Here we go. VERB 74: 3, 2, 1.
06 04 43 12 CMP MARK.
06 04 43 16 CC Roger.
06 04 43 48 CMP Houston, did you say you wanted POO in ACCEPT, also?
06 04 43 50 CC Stand by. We are verifying the E memory first.
06 04 44 23 CC Apollo 9, Houston. The E memory dump is complete. Request POO in ACCEPT. We'll give you a state vector.
06 04 44 29 CMP Roger. Stand by me.
06 04 44 40 CMP Okay. You have POO in ACCEPT.
06 04 44 44 CC Roger.
06 04 47 03 CC Apollo 9, Houston. We have sent the state vector up; we've checked it. It all looks good.

Tape 95/4
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<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 04 47 11</td>
<td>CMP</td>
<td>Okay. Thank you very much. I just went into the 6KXY then. I hope you had the thing in; I'd forgotten.</td>
</tr>
<tr>
<td>06 04 47 16</td>
<td>CC</td>
<td>Roger. We had it in.</td>
</tr>
<tr>
<td>06 04 47 21</td>
<td>CMP</td>
<td>Okay. Thanks.</td>
</tr>
<tr>
<td>06 04 47 25</td>
<td>CC</td>
<td>And you might stick those PRD's on the wall somewhere. We're going to be calling for readout one of these poser there.</td>
</tr>
<tr>
<td>06 04 47 32</td>
<td>CMP</td>
<td>Stick what on the wall!</td>
</tr>
<tr>
<td>06 04 47 34</td>
<td>CC</td>
<td>Those dosimeters.</td>
</tr>
<tr>
<td>06 04 47 35</td>
<td>CKN</td>
<td>Oh, yes. We'll do that. Man, we've got our dosimeters out. We've been waiting all day for you to ask us.</td>
</tr>
<tr>
<td>06 04 47 41</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>06 04 47 49</td>
<td>CC</td>
<td>Roger. You can go to BLOCK on the computer.</td>
</tr>
<tr>
<td>06 04 47 52</td>
<td>CMP</td>
<td>Okay. Thank you.</td>
</tr>
<tr>
<td>06 04 48 53</td>
<td>CC</td>
<td>9, Houston. In about 30 seconds, LOS; Hawaii at 57.</td>
</tr>
<tr>
<td>06 04 48 58</td>
<td>CMP</td>
<td>Roger. Hawaii at 57.</td>
</tr>
<tr>
<td>06 04 49 00</td>
<td>CC</td>
<td>By the way, I don't think we ever told you - Your DSE is good when you are talking into the mike. It's real good.</td>
</tr>
<tr>
<td>06 04 49 07</td>
<td>LMS</td>
<td>All right --</td>
</tr>
<tr>
<td>06 04 49 09</td>
<td>CMP</td>
<td>-- Oh, okay. Good. We'll try and stay close to the mike, then.</td>
</tr>
<tr>
<td>06 04 49 11</td>
<td>CC</td>
<td>Roger.</td>
</tr>
</tbody>
</table>

**HAWAII (KEY 94)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 04 58 44</td>
<td>CC</td>
<td>Apollo 9, through Hawaii. I've got a couple of flight plan updates and targets of opportunity for you.</td>
</tr>
<tr>
<td>06 04 58 50</td>
<td>CMP</td>
<td>Roger. Go ahead.</td>
</tr>
</tbody>
</table>
Roger. ARIA 5 at 15º plus 19, to 15º plus 29.
ARIA 2, 155 plus 13, to 155 plus 22. Here come
some targets of opportunity.

Go ahead.

149 08 46. It's Guadalupe, weather, three frames,
60-second intervals, on track. 149 14 00, Chapingo,
Mexico, geology, 10 frames, 6-second intervals,
40 degrees off nadir south. 149 16 57. San Salvador,
geology, 10 frames, 6-second intervals, 30 degrees
off nadir south. 149 19 43, Gulf of Panama,
oceanography, five frames, 6-second intervals, 10
degrees off nadir north. 149 20 42, Columbia,
geology, 10 frames, 6-second intervals, on track.
149 21 57, Venezuela, weather, six frames, 30-
second intervals, high oblique to north. And,
over.

END OF TAPE
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(HAWAII (REV 94))

06 05 04 05  CC  Apollo 9, Houston.
06 05 04 09  CDR  Go ahead, Houston.
06 05 04 11  CC  Roger. Where did I leave off - cut off on the
targets of opportunity, there?
06 05 04 27  CDR  Stand by just a minute.
06 05 05 05  CMP  Okay. Did you, on the 149 21 57 Venezuelan
weather, but we're almost up to the first one
right now. Do you want to try to pick up from
there?
06 05 05 12  CC  That was it; there was only Venezuelan weather,
six exposures, 30-second intervals, and a high
oblique to the north.

(RESTONE (REV 94))

06 05 05 24  CMP  Okay. It looks like we are only oriented so we
can see south, so we will try and pick up the ones
that are off to the south.
06 05 05 32  CC  Roger.
06 05 05 38  CMP  And I'll give you a readback on the ARIA, since
you might want to know if we got that right or
not. ARIA 5, 154 19 through 154 29; and ARIA
2, 155 13 through 155 22.
06 05 05 51  CC  Roger. And we know that your optics are still
on MANUAL, and request ZERO if you are not going
to use them any more.
06 05 05 56  CMP  Roger. We were just using them to take a look
out front to see where we were going.
06 05 06 01  CC  Okay; good.
06 05 09 40  CC  Apollo 9, Houston.
06 05 09 45  CDR  Go ahead.
06 05 09 44  CC  Roger. Just a comment. Are the cabin fans on
now, or what are you generally doing with the
cabin fans?
We had the cabin fans CF until today, and we had run it with one cabin fan CF today.

Roger.

And, in general, on cycling or storing the H2 cryo's there, are you doing this at any time other than when we request same?

Negative.

Roger.

Yes we have, Ron. We've been doing it every morning - on wakeup checklist.

Okay. That's good.

Yes, that's called out on the flight plan, though.

And, Apollo 9, Houston. I have the block data here. I can either give it here or else over Guam.

Okay. Stand by.

Okay, Houston. Go ahead.

Roger. Block data: Area 099 Charlie Charlie, plus 231, plus 1430 156 15 41 3343; 100 Charlie Charlie, minus 253, minus 1610 15 17 3343; 101 Alfa Charlie, plus 029, minus 0300 15 40 36 3842; 102 Alfa Charlie, plus 165, minus 0320 160 15 37 3352; 103 Alfa, plus 331, minus 0300 161 50 46 3852; 104 Alfa, plus 255, minus 0599 163 17 18 3842. Pitch trim: minus 0.86. Yaw: minus 1.08. Over.

Roger. 099 Charlie Charlie, plus 251, plus 1430 156 15 41 3343; 100 Charlie Charlie, minus 255, minus 1610 15 17 3443. You still with me?

Affirmative. You can go a little faster.

(0608 NET 1)

Tape 96/3
Page 612

06 05 16 14 CC Houston. Your readback is correct. Tananarive at 50.

06 05 16 21 IMP Roger. Tananarive at 50.

TANANARIVE (REV 95)

06 05 52 02 CC Apollo 9. Houston through Tananarive.

06 05 52 04 CXD Roger. Houston, Apollo 9.

06 05 52 08 CMP Houston, Apollo 9.

06 05 52 13 CC Roger. We got a lot of static here. Do you read me okay?

06 05 52 17 CMP We're reading you loud and clear.

06 05 52 20 CC Roger. I have some targets of opportunity - about three - and then one flight plan update.

06 05 52 31 CMP Okay. Go ahead.

06 05 52 34 CC Roger. 150 51 37, Galapagos Islands, geologic, eight frames, 6 seconds, on track.

06 05 52 58 CC At 150 57 07, Peru coastline, eight frames, 8 seconds on track.

06 05 53 19 CMP Okay.

06 05 53 22 CC 9, Houston. Let me correct that one. It's four frames instead of eight frames.

06 05 53 29 CMP Peru coastline, 4 frames.

06 05 53 32 CC Okay. At time 151 47 17, Formosa Strait, oceanography, five frames, 8 seconds, on track.

06 05 53 55 CMP Okay.

06 05 54 02 COS Okay. We got all those; do you want us to read them back to you?

06 05 54 07 CC Let me give you a correction there, Dave, again. On the second one for the Peru coastline, the time is 150 55 07.

06 05 54 24 CMP Okay. 150 55 07. We got all those; thank you.
(GOSS NET 1)

06 05 54 30  CC  Okay. Then I've got a waste water dump for you.
06 05 54 34  CMP  Go ahead.
06 05 54 35  CC  About 151 50, waste water dump. Listening to the DSE last night, you may want sunrise time, 151 38. Sunset, 152 30. Over.
06 05 55 10  CMP  Okay. We have that.
06 05 55 12  CC  Okay.
06 05 55 16  CDR  For you.
06 05 55 17  LMP  You're a sweetheart.
06 05 55 21  CC  It sounded like it was great.

GUAM (REV 95)

06 06 17 47  CC  Apollo 9, Houston through Guam.
06 06 17 51  CDR  Hello, Houston through Guam. Apollo 9.
06 06 17 54  CC  Roger. Loud and clear. Jim, we need some things here. They may be on the DSE and if it is on the DSE, just say so and we will dig it out there. What were the results of the optics sun filter evaluation?
06 06 18 11  CDR  Okay, Ron. I guess we never got to that. We were really sort of busy most of the day and just fixing to take a look at some of that stuff on our next day pass.
06 06 18 20  CC  Oh, okay; good. And, for future planning purposes down here, how many magazines of CEX 368 70 millimeter film are left?
06 06 18 33  LMP  We have about 250 usable frames.
06 06 18 37  CC  Roger. And, then on your targets of opportunity, did you get some of those or most of them on this or the DSE? Okay? If not, can you let us know?
06 06 18 48  LMP  Yes; we got most of those when we went across south of Mexico, there.
06 06 18 55 CC Okay.
06 06 18 56 LMP So far today, we've taken a sizable number of 70 millimeter frames of the ground; southern United States, some of Mexico, some across Africa, and a bunch down through Cuba, the islands down through the Caribbean.
06 06 19 17 CC Roger. Thank you.
06 06 19 27 CDR We filled our daily quota of 70 millimeter frames today.
06 06 19 33 CC Say again.
06 06 19 35 CDR Said we filled our daily quota of 70 millimeter frames. I figured we had to take about 200 a day, so we are — we're well up on it.
06 06 19 43 CC Very good; thank you. I guess you still owe us a powerdown consumables onboard readout.
06 06 19 51 CDR We don't have those available for you yet; we will get them for you in just a minute.
06 06 19 55 CC Okay. No hurry.
06 06 19 57 CDR And in another half hour or so, I'll probably have some more data for RETRO on where things are.
06 06 20 04 CC Roger.

HAWAII (REV 95)

06 06 31 31 CC Apollo 9, Houston through Hawaii. Standing by.
06 06 31 41 LMP Okay, Houston. We've got some data here for you.
06 06 31 44 CC Very good; ready to go.
06 06 32 06 CC Roger. Copy.
06 06 32 07 LMP Temperatures are all OFF SCALE HIGH, PHD: the commander, 3114; the LMP, 2015; and CMP is unknown.
06 06 32 24 CC Roger.
06 06 38 30  LMP  Houston, Apollo 9.
06 06 38 36  CC  Apollo 9, Houston. Go.
06 06 38 39  LMP  Roger. We have C&D docimeter reading.
06 06 38 42  CC  Hey, I thought it was on the IM.
06 06 38 46  LMP  No, he's got a 6115.
06 06 38 50  CC  Roger. Thank you.
06 06 38 55  CDR  Houston, Apollo 9, here.
06 06 38 56  CC  Houston. Go.
06 06 38 59  CDR  Hey, just as a matter of interest, all our windows are staying very clean. That lefthand rendezvous window looks like it stopped getting that white film all over it and has remained the same. All the rest of them are quite clear.
06 06 39 14  CC  Very good; thank you.

END OF TAPE
HAWAII (REX 95)

06 06 39 16  CC  They get an occasional little bit of what looks like maybe frost or moisture between the panes, but it goes away. They are quite good.

06 06 39 28  CC  That makes us feel a lot better.

06 06 40 12  LMP  Houston, Apollo 9.

06 06 40 13  CC  Houston. Go.

06 06 40 14  LMP  Roger. For RETRO's information, the equipment that we brought back from the LM with us - the checklist and things like that - are stowed down in the - one of the compartments on A-8, the compartment largest and closest to the lower equipment bays.

06 06 40 35  CC  Okay. That sounds good.

06 06 40 47  LMP  The equipment that was in there didn't weigh very much. There was some underwear and some things like that. We moved that up to the top compartment in A-6 and we moved the one heavy piece of equipment, the tool kit, down into A-5.

06 06 40 57  CC  Roger. Tool kit is in A-5 now.

06 06 41 10  LMP  And the distrripper bracket which was off on the A-8 has been moved down to A-5.

06 06 41 16  CC  Roger.

06 06 41 23  COR  As a matter of interest here, we brought all the LM books back with us except for the malfunctions procedures and the systems book. So we brought all the checklists back and the cards, plus another 3 or 4 pounds of loose pieces. I think, altogether, we have something on the order of 10 pounds in that box.

06 06 41 44  CC  Okay; sounds good.

06 06 41 46  LMP  Including an ascent engine in A-7.

06 06 41 51  CC  Okay. (Laughter)

06 06 42 47  LMP  Houston, Apollo 9.

06 06 43 49  CC  Houston. Go.
One other item: that lithium hydroxide canister that we brought was supposed to be stored in A-1, and it is. I guess we ought to tell RETRO that, too.

Roger. I understand that it is in A-1 where it belongs, now. Right?

That's correct.

Okay.

9, Houston. We're about to lose you here. I guess you still owe us a CO₂ canister change.

Okay. We'll get to it.

Roger.

9, Houston.

Go ahead.

Roger. What do you want me to put on your steak that I'm going to have for you tonight?

Nothing; just eat it just raw. Well, not raw; just medium rare. Don't put anything on it; you'll ruin the taste.

Okay. (Laughter)

But taste it good for us, will you?

Will do.

You can put your knife and fork on it.

(Laughter)

Listen, you may be having steak, but I have a larger choice of things right here. I have day 6, meal C; I have day 6, meal C; I have day 6, meal C; and I even have day 6, meal D.

Hey, that sounds great; perfect selection.
06 07 24 23  CC  Apollo 9, Houston.
06 07 24 27  CDR  Go ahead.
06 07 24 29  CC  Roger, Apollo 9. Just wanted to let you know that you can rest easy tonight; the National Guard is on the duty.
06 07 24 33  CDR  Oh, very good. I'm very glad to hear that.
06 07 24 43  CC  Hey, Jim. We would like you to check to make sure that you deactivated the DAP.
06 07 24 48  CDR  Okay. We will take a quick look and deactivate it.
06 07 24 53  CC  Alrighty.

HAWAI I (REV 96)

06 08 04 33  LMP  Houston, Apollo 9.
06 08 04 36  CC  Apollo 9, Houston. Go.
06 08 04 43  LMP  Roger. I'd like to inform you we did the fuel cell 0 purge at 151 48, and we'll take away purging fuel cell 2 with fuel and hydrogen, and we're just about to stop. We started that purge at 152 01 30.
06 08 05 10  CC  Roger. Apollo 9, Houston. Copy.
06 08 05 14  CDR  Houston, this is Apollo 9. How do you show us on hydrogen quantities remaining for the rest of the flight? How are we following the curve? I show us a little bow on the curve but holding steady.
06 08 05 27  CC  Roger, Apollo 9. Houston copies. Stand by.
06 08 06 14  LMP  Houston, we just purged fuel cell 2 for 1 1/2 minutes with H2.
06 08 06 21  CC  Roger, Rusty. We copy that.
06 08 08 05  CC  Apollo 9, Houston.
06 08 08 10  CDR  Go ahead, Houston.
06 08 08 14  CC  Roger, Jim. We sort numbers on the chart. Let's do it from here. CM/CS 1347 1451. 461.
surplus of 193 pounds, 1-9-2 pounds of O2 and
18 pounds of H2. That may not correlate with
the curves you have to hand are exactly because your
cursor were not corrected for the loaded condition.

Okay. Can you tell me what those numbers are
in percent remaining indicated?

Apollo 9, Houston. Say again.

Roger. Can you tell me what number percent re-
main? Indicated on the page?

Roger. Stand by.

HELSTON: (REV 96)

Apollo 9, Houston.

Go ahead, Houston. Apollo 9.

Roger, Jim. We're getting some numbers on the
percentage of the cryos remaining at 0K/1 K SER,
and in the meantime, I guess we'd just sort of
like to remind you of the waste water dump and
to put inverter 3 on MAIN A before you all go
off to sleep.

Okay. And I think we'll probably put inverter 3
on MAIN A now, and we're just preparing to do
the water dump.

Alright.

How's everything going down there, Mr. Ward?

Ch, it's going very nicely, Mr. McDivitt.

Very good. I want you to stay awake tonight.
Keep a look out for us.

Al, did you enjoy your steak tonight?

What steak? I had eggs for breakfast tonight.

That dirty hellin' sauce to a rat - tell us he was
going to be real and get a strike for us.

He went out and got one for himself. He didn't
take care of me.
<table>
<thead>
<tr>
<th>Time</th>
<th>Caller</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 08 13 42</td>
<td>COR</td>
<td>Hey, that's a great shift you got, isn't it?</td>
</tr>
<tr>
<td>06 08 13 48</td>
<td>CC</td>
<td>Yes, it's pretty neat.</td>
</tr>
<tr>
<td>06 08 13 51</td>
<td>CDR</td>
<td>Who ever gave you that bum deal?</td>
</tr>
<tr>
<td>06 08 13 53</td>
<td>CC</td>
<td>Want me to name names?</td>
</tr>
<tr>
<td>06 08 13 57</td>
<td>CDR</td>
<td>No.</td>
</tr>
<tr>
<td>06 08 14 00</td>
<td>EXP</td>
<td>Hey, listen. I got one like that from him, too, once.</td>
</tr>
<tr>
<td>06 08 14 01</td>
<td>CC</td>
<td>Okay, boss man. Here's your surplus of cryo's O₂: you'll have 29 percent; and H₂, you'll have 15 percent remaining CN/SN SEP.</td>
</tr>
<tr>
<td>06 08 14 17</td>
<td>CDR</td>
<td>Okay. Thank you very much.</td>
</tr>
<tr>
<td>06 08 14 19</td>
<td>CC</td>
<td>Yes, sir.</td>
</tr>
<tr>
<td>Time</td>
<td>CC</td>
<td>CDR</td>
</tr>
<tr>
<td>-------</td>
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<td>--------------------------</td>
</tr>
<tr>
<td>06 08 15 01</td>
<td></td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>06 08 15 07</td>
<td></td>
<td>Go ahead, sweet lips.</td>
</tr>
<tr>
<td>06 08 15 09</td>
<td></td>
<td>Okey-dokey. You're about to go out of sight here. I'll give you the ARIA times if you'd like them in case you need to call us.</td>
</tr>
<tr>
<td>06 08 15 14</td>
<td></td>
<td>We already have 5ialis that Ron gave us.</td>
</tr>
<tr>
<td>06 08 15 16</td>
<td></td>
<td>Oh, okey-dokey.</td>
</tr>
<tr>
<td>06 08 15 17</td>
<td></td>
<td>Thanks anyway.</td>
</tr>
<tr>
<td>06 08 15 19</td>
<td></td>
<td>Yes, sir. Just looking out for you. We're going to have 108 here pretty soon, and I guess we'll be talking to you in the morning.</td>
</tr>
<tr>
<td>06 08 15 23</td>
<td></td>
<td>All right. Say hello to my lovely family for me, will you?</td>
</tr>
<tr>
<td>06 08 15 25</td>
<td></td>
<td>I'll do that.</td>
</tr>
</tbody>
</table>

END OF TAPE.
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(G OSS DET 1)
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
Apollo 9, Houston.

Hello. Houston, Apollo 9.

Oh, good morning. The alarm clock has just gone off.

I can tell.

Hello, alarm clock.

Tick-tock!

How's everything down there in Houston today?

Oh, real fine. Good - looks like you are all sleeping pretty good.

Yes, we sure are.

Guess I'd ought to use past tense on that now.

Okay. You're over Carnarvon - just coming into the sunset here. Guess just a little better timing - we'd gotten you up at sunrise, but we let you sleep a little bit extra here.

We'll take it.

Okay.

No snap, but we don't have any complaints.

Hey, Houston, 9.

Go ahead, 9.

We got one little item for you. Last night we were shifting cabin fans - it was a little warm in here, and we had cabin fan 2 on; we turned it off, turned it on, and it did not come on. It was hot to the touch, so we turned it off and pulled the circuit breakers.


That's affirm. And 2 is still working okay.

Okay.
And we noticed the suit cabin temps were running a little higher yesterday than they had been previously, and wonder what you all thought about it on the ground.

Okay. Copy. Stand by.

Apollo 9, Houston. About 1 minute LOS Carnarvon. We'll have you over Honeysuckle in about a minute - minute and a half. Bring up your S-band volume. We can turn off the fan in H₂ tank 1 now and turn off inverter 3.

Okay. H₂ tank 1 fan coming off now, and inverter 3 coming off.

Okay.

And, Apollo 9, Houston. We've got you through Honeysuckle now for about another 6 minutes.

Roger, Houston. You're very, very weak.

Roger. I think it was just the start of the lockup; how now, Dave?

That's very nice.

Okay.

And, Apollo 9, Houston. About 1 minute LOS Honeysuckle. We'll see you at Mercury in about 5 minutes.

Okay. Mercury in 5.

Roger. Mercury in 5.

Roger. Copy.

And, Apollo 9, Houston. We have you through Mercury, about 7 minutes.
06 20 37 03  CMP  You want to get the block data and stuff done?
06 20 37 11  CC  Roger. I'm standing by. I have block data,
                   I have consumables, and I have flight plan update. 
                   Just let me know when you're ready.
06 20 37 22  CMP  Okay. I got the consumables here; why don't 
                   we hit that one first?
06 20 37 30  CC  Okay. The hour on this one is 162. Starting:
                   43 12 47 15 48 16 47 16 327 24 36 29 39. End of 
                   update.
06 20 38 14  CMP  Roger. 162 12 47 15 48 16 47 16 327 24 36 
                   29 39. And I wonder if we could have SM RCS 
                   DAP redline, too, please?
06 20 38 35  CC  Roger. Reading: quad A, 28 36 36 38.
06 20 38 49  CMP  Okay. 28 36 36 38.
06 20 39 05  CC  That is affirmative.
06 20 39 10  CMP  Okay. Go ahead with the block data.
06 20 39 10  CC  Okay. Reading block data number 17: 
                   105 2 Bravo, plus 332, minus 0290 164 54 06 2844; 106 2 Alfa, 
                   plus 288, minus 0300 166 27 38 2844; 107 Alfa 
                   Charlie, plus 211, minus 0310 168 01 03 2844; 108 
                   1 Alfa, plus 263, minus 0380 169 26 03 2844; 
                   109 4 Charlie, plus 334, minus 1590 172 18 34 
                   3831; 110 4 Bravo, plus 328, minus 1609 173 15 15 
                   3831. Okay. Your pitch and yaw trims for REV's 
                   105 through 108: your pitch trim, minus 0.88; 
                   yaw, minus 1.09. For REV's 109 and 110: pitch, 
                   minus 0.88; yaw, minus 1.40. End of update.
06 20 43 00  CMP  Roger. Coming back: 105 2 Bravo, plus 332, 
                   minus 0290 164 54 06 2844; 106 2 Alfa, plus 288, 
                   minus 0300 166 27 38 2844; 107 Alfa Charlie, 
                   plus 211, minus 0310 168 01 03 2844; 108 1 Alfa, 
                   plus 263, minus 0380 169 26 03 2844; 109 4 Charlie, 
                   plus 334, minus 1590 172 18 34 3831; 110 4 Bravo, 
                   plus 328, minus 1609 173 15 15 3831. And the 
                   pitch and yaw trim for REV's 105 through 108: 
                   pitch, minus 0.88; yaw, minus 1.09. For REV's 
                   109 and 110: pitch, minus 0.88; yaw, minus 1.40.
06 20 44 15  CC  Roger. Houston confirm the update. We'll see 
                   you at Texas around 65. We'd like to remind 
                   you of the O₂ purge and CO₂ filter change.
Okay. O₂ purge and CO₂ filter change, and 52 for Texas.

That's affirm.
Apollo 9, this is Houston. Got you through Texas now, showing you just coming up on the coast of lower Mexico. I have a flight plan update for you.

Okay. Stand by one.

Roger.

Okay, Houston. We're ready. Go ahead.

Okay. The first change will be at the hours 170 plus 20. We want to add a P52 alignment to NOMINAL, and your time for that NOMINAL alignment - T-align: 170 plus 16 plus 00. Your next item will be another P52, and the hour will be 171 plus 45. I'd like to add another P52 to NOMINAL. Your T-align time: 172 plus 19 plus 00. Okay. We might be rushing you on this rev, but we've got a target of opportunity we'd like to have photographed over Africa and - This is if you can get to it. The time of this is 165 plus 25 plus 33, and we'd like to have the target of the countries of Niger and Chad. And the time I gave you will be the first frame. We'd like to have 10 pictures, 6 seconds apart, shooting 30 degrees south of the nadir.

Okay. Are you with me? I've got three more items.

Okay. We're with you. Go ahead.

Okay. At hours 172 plus 28, we're going to do some COMM checks with the ARIA. This will be both S-band and VHF. So, we'd like to have S-band volumes up, and another COMM check with the ARIA at 174 plus 06.

Okay. We got those.

Okay. And the last one is at 174 plus 55: delete the battery B charge and add waste water dump.

Okay. You want me to read it back now?

That's affirmative. That's the end of it.

Okay. 176 20, a 0 to NOMINAL, T-align time, 170 plus 16, 171 45, P52 to NOMINAL, 172 19 00 for T-align. 165 25 33, targets of opportunity. We
got that and I think we will be able to make that okay. Figure and Chad, 10 frames, 8-second intervals, 30 degrees south of the nadir. And 172 25, COMM checks with ARIA - S-band and VHF, and one COMM check at 174 06.

06 21 02 31 CC That is affirmative, and 174 plus 55, delete the battery B charge; add waste water dump.

06 21 02 37 CXP Oh, yes. We got that one, too.

06 21 02 40 CC Okay. That's the flight plan updates as of now.

06 21 02 44 CMP Okay.

06 21 03 31 CC And, Apollo 9, Houston. I'm just standing by here with a map update. I'd like to give it to you before you have to ask for it.

06 21 03 37 CMP Go ahead.

06 21 03 39 CC Okay. REV 104, which you are on now: 164 51 05; longitude, 124.5 west. And if you want to use your star chart, right Ascension, 15 plus 55.

06 21 04 07 CMP Okay. REV 104: 164 51 05; longitude, 124.5 west; right Ascension, 15 plus 55.

06 21 04 17 CC That is affirmative.

06 21 04 18 CDR Thank you.

06 21 04 20 CC Roger.

06 21 04 30 CC And, Apollo 9, Houston. Any time at your convenience we'll take a crew status report.

06 21 04 37 CDR Okay. This is the Commander. I had about 9 hours sleep last night. I took an Actifed and a vitamin pill yesterday.

06 21 04 48 CMP This is the CMP. I had about 9 hours sleep last night and had a vitamin pill yesterday.

06 21 04 59 CDR Okay. And hastily had one vitamin pill and 8-1/2 hours of sleep.

06 21 05 05 CC Okay. I copy those. Thank you.
06 21 16 44  CC  Apollo 9, Houston.
06 21 17 20  CC  Apollo 9, Houston through Canaries.
06 21 17 23  CMP  Roger. Houston, 9. You're five-by.
06 21 17 30  CC  Roger. We would like to recommend the following RCS configurations for today.
06 21 17 35  CMP  Houston, Apollo 9. You are five-by.
06 21 17 36  CC  Roger, Apollo 9. Do you read Houston?
06 21 17 39  CC  I'd like to give you the RCS configuration.
06 21 17 43  CMP  Roger. Go ahead.
06 21 17 46  CC  Okay. We would like - Today we would like to use quads Baker and Charlie, and use for roll Baker Delta - roll - and on SPS-7, we are recommending Baker and Delta ullage.
06 21 18 17  CMP  Seven: use Baker Delta for the ullage.
06 21 18 22  CC  You cut out on the first part of the readback. Use quad Baker and Charlie, BD roll, and BD ullage.
06 21 18 35  CC  Roger. Thank you, Dave.
06 21 18 37  CMP  Roger.
06 21 21 37  CC  Apollo 9, Houston. Thirty seconds LOS. We will see you at Carnarvon at 51.
06 21 21 44  CMP  Roger. Carnarvon at 51.

CARNARVON (REV 105)

06 21 50 49  CC  Apollo 9, Houston. Get you through Carnarvon. Standing by.
06 21 50 53  CMP  Roger. Houston, Apollo 9.
<table>
<thead>
<tr>
<th>Time</th>
<th>ID</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 21 51 10</td>
<td>CDR</td>
<td>How's the weather in Houston today?</td>
</tr>
<tr>
<td>06 21 51 15</td>
<td>CC</td>
<td>It's a little chilly. It's been snowing the last couple of days, but it's pretty chilly. It may start turning a little cloudy this afternoon, they're saying.</td>
</tr>
<tr>
<td>06 21 51 27</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>06 21 51 34</td>
<td>LMP</td>
<td>Hey, Stu, this is Rusty.</td>
</tr>
<tr>
<td>06 21 51 36</td>
<td>CC</td>
<td>Yes, go ahead, Rusty.</td>
</tr>
<tr>
<td>06 21 51 38</td>
<td>LMP</td>
<td>How about giving the Frau a call and saying good morning to her for me?</td>
</tr>
<tr>
<td>06 21 51 42</td>
<td>CC</td>
<td>Okay. I'll do that for all three of you.</td>
</tr>
<tr>
<td>06 21 51 46</td>
<td>LMP</td>
<td>Mine, this is.</td>
</tr>
<tr>
<td>06 21 52 02</td>
<td>CC</td>
<td>Say, there's some bit about this 39S burn that we'll be talking to you probably in more detail, but I'd like to start on how if you have time to listen for a couple of minutes.</td>
</tr>
<tr>
<td>06 21 52 15</td>
<td>CMP</td>
<td>Okay. Do we have to write anything down?</td>
</tr>
<tr>
<td>06 21 52 18</td>
<td>CC</td>
<td>No, I don't think so. Just sort of let me summarize a few things here.</td>
</tr>
<tr>
<td>06 21 52 23</td>
<td>CMP</td>
<td>Okay. Go ahead.</td>
</tr>
<tr>
<td>06 21 52 25</td>
<td>CC</td>
<td>Okay. On this burn we are going to try to get a better look at this - at the FUGS system. We've analyzed the data and we really - we really think we understand most of the funnies. So to get data on a burn where we are using allage, we've increased the length of this burn. The burn time is going to be about 25 seconds, and we're going to use the FUGS on it. We're going to use it in the PRIMED mode, and don't switch. You may get caution and warning lights after about 5 seconds when it comes on, and there's a definite procedure here we want to use for the FUGS. It's about three steps, which I won't ask you to write down later on, but I just wanted to pass this on to you so you can be thinking about it.</td>
</tr>
<tr>
<td>06 21 53 23</td>
<td>CDR</td>
<td>Okay. So you're going to make the burn 25 seconds longer. Do we have that much fuel left?</td>
</tr>
</tbody>
</table>
Roger. That's supposed to be the plan. We can get you the specific details on it, Jim.

Okay. Don't forget we have one more after this.

Doggone! I knew we were forgetting something.

I figured you guys left out one step, just the RETRO burn, huh?

Yes; that's it.

Okay. Why don't you give me a hack at how much fuel I have left?

Okay. You have 68 seconds of burn time left and we are going to take about 25 of those.

I blocked you out; say again how many seconds left?

You have 68 seconds left and we are going to use 25 of those.

Okay.

And your deorbit burn is shaping up to be about 12 seconds.

Okay.

And, Apollo 9, this is Houston. Just for tank management here, we would like to turn the heater off in 02 tank 1. Leave the heater in tank 2 in AUTO.

Okay. The heater on 02 tank 1 is going off at this time, and we leave the heater in 02 tank 2 in AUTO.

Okay. Very good; thank you.

What's our resulting orbit going to be when we finish up our 25-second burn here?

Just a second, here. I took a hard copy of this thing a minute ago, but I can't read it. Stand by one here.

Still going to be about 200 by 95 or so.
06 21 55 38  CC  Roger. It's going to be 250 by 98.
06 21 55 42  CDR  Very good; 250 by 98.
06 21 56 10  CC  And, Apollo 9, we'll have you at Honeysuckle in about a minute, if you will bring up your S-band volume at that time.
06 21 56 16  CDR  Okay. Very good. We'll come up on S-band.
06 21 56 20  CC  Okay.

HONEYSUCKLE (REV 105)

06 21 58 41  CC  And, Apollo 9, Houston. We should have you through Honeysuckle.
06 21 59 28  CC  And, Apollo 9, Houston. We've got you locked up on Honeysuckle about 5-1/2 minutes.
06 21 59 34  CMP  Roger.
06 21 59 39  CDR  Hey, Stu, were you the fellow who told us about the big cake on the Guadalcanal?
06 21 59 44  CC  Yes, I mentioned that.
06 21 59 46  CDR  Well, ever since you mentioned it, Rusty and Dave haven't stopped talking about it.
06 21 59 51  CC  I sure am sorry about that. Maybe we better send a TWX out there and have them make that a 700 pounder.
06 22 00 29  CDR  What's the weather forecast for the recovery area at recovery time?
06 22 00 33  CC  Jim, I hate to bring that up. I was going to wait until you asked. We got a look at that this morning, and - course it's a long range forecast on how fast this front moves through, but they are calling right at your prime site fo. fairly heavy winds - Yes, around 30 knots or so, and waves around 6 to 8 feet. Now, that's the first cut right now. We're starting to get - And we'll make sure the weather is good, though. I don't think we'll plunk you down in the middle of a front, there.
06 22 01 12  CDR  Okay.
06 22 01 15  CDR  Stu, you keep putting the drama back into it.
06 22 01 19  CC  Well, you know, you've had too easy a time here. We've got to keep jacking you up a little.
06 22 01 26  CDR  I've noticed that.
06 22 01 37  CC  But you know, Jim, it sure is lucky you weren't landing out in there either, yesterday. I don't know how it is this morning, but all day yesterday and last night I guess the waves of - having 10 to 12 foot swells out in that area.
06 22 01 52  CDR  Yes. When we were flying - When we've been across the Atlantic, there, it looked like it's been pretty rough down there. You could see the white caps from up where we are.
06 22 02 01  CC  Yes. It's really been kicking up. Somebody was telling me the winds around Bermuda this morning were running 60 knots.
06 22 02 10  CDR  Oh, great!
06 22 02 13  CC  Yes, in fact we're not even using Bermuda because the winds are blowing so hard it's hard to get a lock on you.
06 22 02 20  LMP  It blows those radio waves right out of the way, huh?
06 22 02 24  CC  Roger.
06 22 04 05  CC  Hey, Jim, I still got you for about another minute, I think. Instead of having to depend on the forecast, you're the best weather RECON we got, we'll just let you pick out your own area.
06 22 04 20  CDR  You still there, Stu?
06 22 04 21  CC  Yes. I'm still here.
06 22 04 26  CC  We'll see you over Mercury at 11.

MERCURY (REV 105)

06 22 12 07  CC  Apollo 9, Houston. I've got you through the Mercury now, and how much time you think you'll have on this rev for some pictures?
06 22 12 18 CDR
Quite a bit. We're just eating; we're just finishing up eating and we'll be powering up the spacecraft here in a few minutes.

06 22 12 24 CC
Okay.

06 22 12 29 CDR
Give us the updates, Stu. If we get them, fine; if we don't, that's too bad.

06 22 12 31 CC
Okay. Let's just take them in order here, then. The first one we would like you to have would be the Corpus Christi area, and I can give you a time on that. It's 33 plus 33. It's on this rev. We would like to have three shots at 6-second intervals and you should be shooting right on the nadir on this one. I think you go right over it.

06 22 13 05 CMP
Okay.

06 22 13 06 CC
Okay. And we would like to have you shoot Galveston, and that will be at 34 plus 05. Like to have three shots, 8-second interval, and you will be shooting 30 degrees north of the nadir.

06 22 13 30 CMP
Stu, how far north of the nadir was that?

06 22 13 34 CC
30 degrees, it says.

06 22 13 37 CMP
Okay. Thank you.

06 22 13 40 CC
Okay. I've got a couple more. On this one, the Mississippi Delta. That will be at 35 plus 17. We would like to have three shots, 8-second interval, and you will be shooting 30 degrees south of the nadir.

06 22 14 07 CC
And another one will be Mobile, Alabama, at 35 plus 43. Like you to take three shots, 8-second interval, shooting 70 degrees north. And the last one I have for you now will be on this rev on - coming across Africa, starting at 52 plus 00. Like to have you use the 16mm, 75mm lens, shoot it at six frames a second, using CEX 363. We would just like to have you take a strip all the way across the continent.

06 22 15 06 CDR
Okay. We will just take a strip across the continent.

06 22 15 10 CC
Roger. And one other thing. I would like to have some 16mm settings with the 16mm camera, 75mm lens,
same film as above - and this is just any day-light pass where you can see the sun glinting off the ocean. If you can find this, we would like to have about 5 minutes of film on that at six frames a second.

Okay.

And that will do it for now. We are about to lose Mercury. We will see you over Redstone about 23.

Okay.

Apollo 9, Houston through the Redstone. We should have you for about the next 30 minutes here coming across.

Okay.

Hey, Rusty, you busy? I got a little news.

Go ahead, Stu.

Roger. Elin won first place in the science fair.

Fantastic. That kid's going to get a big head. That's two years in a row.

Yes; that's what I understand.

That's good. Tell her she's a good girl, for me, Stu.

Okay. Sure will.

END OF TAPE
And, Apollo 9, this is Houston. If you have got time as you come across us, you might give us the weather report - how it looks from weather RECON there.

Okay. I'll be your friendly weather man this morning.

All right. We'd appreciate that.

Houston, this is Apollo 9, now. We are just about to Corpus, and the weather doesn't look very good over in this area. It might be better up around Houston there.

Roger. Copy.

And, Apollo 9, this is Houston. These pictures at Corpus and Galveston we would like regardless of the weather. They are also interested in the weather in those pictures.

Okay. We'll hurry then.

Okay, Houston. This is Apollo 9, now. We're coming across - We're in the vicinity of Corpus Christi now. The cloud deck is breaking up. I can look out into Texas which is north of our track here. We're right along the Gulf Coast. It's all pretty clear out there.

Okay. How does it look down to the south, Jim? Is there a storm down there moving up on us?

No, I didn't see. It just looked like a lot of high clouds.

Okay.

Yes. You call them.

Houston?

Go ahead. Apollo 9, Houston.

Roger. We're running across the East Coast now; you can look down into Florida. All of Florida is almost clear except just the tip end. There's a lot of snow along the East Coast. They just have had some pretty good snow storms up there recently, and it comes way down here to the south.
... now, and there's a definite break in the clouds right along the coast. Then as you get out into the Atlantic there's a lot of clouds, but they don't look to be very fierce, just a lot of low-to-middle clouds, it looks like. I don't see any big thunderstorms or anything that looks like major weather sticking out.

MILC (REV 106)

Okay. Copy. You know, the weather map of yesterday shows a pretty good front laying right out in the Atlantic there, and it was really kicking it up. Also, one way up to the north - I don't know how far up you can see, but there's a disturbance way up to the north that's causing some swells coming down as far south as off Florida, there.

Okay. Well, I can see that. Way up to the north it looks like there is some pretty significant weather.

Yes. That beauty is kicking off swells, and they are affecting all the way down in through - underneath your track down in there.

I'll be darned. Let's see if we can see the white caps on the water down here today.

Okay.

And, Jim, just to elaborate a little more on that weather briefing that we got on the recovery this morning - we are going to wait until tomorrow to see - get a better look. You know, at this stage of the game, that was just the first prediction on that movement of the front.

Okay. And looking down here, I can see white caps on the ocean.

Okay. You can? Is that affirmative?

Affirmative. Yes, I can see white caps on the ocean.

Okay. And we'll give you a hack here when you're over the prime landing spot.
Yes. It really looks rough and windy down there, although there aren't many clouds - aren't too many clouds; it's about five- or six-tenths coverage.

Stu, how about getting those things moved out, okay?

Okay. In work.

Thank you.

As a matter of fact, Houston, there's really a - how that we get out over the ocean here, you can see the water pattern more. Up to the north of us must be the center of a great big thick low, and there's probably a front hanging down out of it, swirling off to the southwest and then around to the southeast. You can see the cloud pattern follows that cyclonic pattern all the way down here to where we are; must be, oh, I guess it's a thousand miles across this thing.

That's really a vivid description, Jim. It just matches the weather map here perfectly.

And, Apollo 9, the Vanguard is having 18-foot swells. We might have a little trouble with the COMM across there. If so, we'll pick you up at Canaries; we'll have Canaries ACQ around 49.

Apollo 9, Houston. Do you read?

Roger. We do; go ahead.

Roger. You have a GO for 122 dash 1, and you'll be coming over the Vanguard here. We're talking through the Vanguard now, and they are having 18-foot swells down there.

Oh, boy! You're making me seasick way up here, Stu.

Roger.

I'm sure glad we advanced to where the CAP COMM stays in Houston.

Yes, I'd hate to have you getting sick on us.

There you go.
They didn't give you the period of those swells, did they, Stu?

No, they sure didn't, Rusty. I bet we can find out, though.

And, Rusty, Houston here. The period on the swells is about 12 seconds.

Okay. That's lovely; a lot of energy in those.

Roger.

And, Apollo 9, Houston. I've got about six steps on this PUGS operation for this burn; and any time that you've got something to write on and want me to cover them, I'll be glad to.

Stand by just a second, Stu.

Roger. No sweat; we've got all kinds of time.

Apollo 9, Houston. Thirty seconds LOS Canaries; see you at Tananarive 03.

Okay, Stu. And the weather is real nice across Africa. We're getting a 16mm strip.

Real fine, Jim. Thank you.

Apollo 9, Houston through Tananarive. Standing by.

Apollo 9, Houston through Tananarive. Standing by.

CAP COMM uplinking properly.

... Apollo 9. How do you read now?

Apollo 9, Houston. How do you read?

We're reading you. Why don't you go ahead — but why don't you go ahead and try that procedure on the PUGS?
Okay, Rusty. I'm reading you now. Step 1: SPS gaging to AC-1. Step 2: SPS heater/gaging. MAIN A, MAIN B, CLOSED. PUGS mode, PRIMARY. Now go to test 2 until oxidizer reads 10.8 percent. Record the fuel readings before ignition. Do not switch PUGS mode during the burn. We would like to emphasize that we do feel you will get at least one caution and warning - maybe more.

Okay. Just before I do the test 2 - I missed that step.

Okay. You go test 2 until oxidizer reads 10.8 percent.

I know; just before that you want me in PUGS mode PRIMARY?

That's affirmative. The third step is PUGS mode PRIMARY.

MAIN A, MAIN b, CLOSED.

Okay, Apollo 9. If you read, we are not getting you. I believe you were attempting a readback. We'll be here for about 2-1/2 minutes, if you want to try again in about 30 seconds. If not, we'll see you at Carnarvon at 25 and confirm it then.

And just to clarify one other point: we do feel you will get this caution and warning when the PUGS comes in about 5 seconds after ignition.

Apollo 9, Houston. Thirty seconds LOS Tananarive; Carnarvon 25.

CARNARVON (REV 106)

Apollo 9, this is Houston through Carnarvon.

Go. Houston, Apollo 9.

Okay. And situation normal; I couldn't read you very well over Tananarive. I just wanted to verify that Rusty got those steps.

Okay. You ready to copy, Stu?

Roger. Go ahead.
Okay. Let me read you back what I've got. That was SPS going to AC-1. The MAIN A and B breakers CLOSED on the SPS and heaters, and FUSS node to PRIMARY. 100 in number - test 2 until the oxidizer reads 10.8 and record the fuel. Expect the caution and warning during the burn. And the fuel after scoring with 15-l, 1-5-l, and the oxidizer balance is FULL SCALE DECREASE.

Roger. Very good, Rusty. We copy, and would like to make two other notes. Do not switch the node during the burn; go ahead and let it stay in PRIMARY. And we want to emphasize that we do feel that you will get caution - at least a caution and warning about 5 seconds after ignition. When this comes in - and you may get more than one.

Roger. The way it behaved the other day, Stu, I'm not sure how clear that got across, but the oxidizer unbalanced during the burn with extremely unstable - it would jump all over and give repeated caution and warning, and unless something changed, I'd expect the same behavior.

Okay, Apollo 9. Just to make it clear again: I have seen all of that on the data, and we do feel we do know the answers to it. And we do want to do it on this test to see if what we are going to get - for two things. One on an ullage start which we have not seen on this system, and the other one is attempt to really nail down these biases that we are seeing in the oxidizer storage tanks.

Houston, this is Apollo 9. We're all for the test. We're just commenting on it.

Okay. Real good. And, yes - those series that you got the other day - those seven - Every one has been nailed down except one on that caution and warning.

Roger.

What did you nail them to, Stu?

Well, four of them - One of them was an O₂ high flow that came in - I don't mean O₂. I mean N₂ tank pressure - came in right at that time, and four of them - -
Houston, this is Apollo 9 here. We're flying over Australia now, I guess, and we can see a number of cities down there all lighted up. Which one are we over right now? It's a great big one with all kinds of lights.

Okay. That should be Perth, Apollo 9.

Okay. Hello all you people down there in Perth. Apollo 9 sends you greetings.

And, Apollo 9, Houston.

Go ahead.

Okay. Just got a comment. Rusty asked about that - those warnings. What it was - We had a small residual in that oxidizer storage tank, and it appeared to be wetting the capacitance probe and getting real erratic readings on it.

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Okay.

And, Apollo 9, about 30 seconds LOS Carnarvon. We'll have Honeysuckle in about a minute and a half with your S-band volume up, please.

Okay.

Good morning, Apollo 9, through Honeysuckle.

Good morning. Who is this speaking to us?

Ron's back on in the daytime. Would you believe it?
06 23 33 25  CDR  No, I don't believe it.
06 23 33 27  CDR  Hello, Ron back on in the daytime. How are you?
06 23 33 31  CC  Good shape; good shape.
06 23 33 32  LMP  How was your steak?
06 23 33 33  CC  Really delicious.
06 23 33 37  CDR  Hey, listen. I've had guys play dirty tricks on me before, but nothing like that one last night. It really got me.
06 23 33 43  CC  I figured that would really get to you.
06 23 33 45  CDR  It really did.
06 23 33 48  LMP  Jim was so disturbed he only got 8-1/2 hours of sleep last night.
06 23 33 56  CMP  Hey, Ron. We've got some gyro torqueing angles if you didn't get them there on that P52.
06 23 34 02  CC  Roger. Go.
06 23 34 04  CMP  Okay. GET of 167 33 30, minus 01322, plus 01073, minus 00625.
06 23 34 22  CC  Roger. 9, Houston. We copy.
06 23 34 25  CMP  And that was P52 to a nominal T-align of 170 - 170 48 00.
06 23 34 38  CC  Roger.
06 23 34 45  CC  Hey, Dave. This is Stu again.
06 23 34 49  CMP  Go ahead. Say again, please.
06 23 34 51  CC  Okay, Apollo 9. Just to comment on this alignment now: you will be doing a preferred burn, so we'll want that — another T-align on after the burn before the S065 pass.
06 23 35 06  CMP  Roger. We'll do that. We just wanted to get the preferred — a final line-up here so we'd be in plane and all squared away.
06 23 35 14  CC  Okay. I understood that. I just wanted to make that other note.
That's a good note.

HUNTSVILLE (REV 106)

Apollo 9, Houston through Huntsville.
Apollo 9, Houston.
Apollo 9, Houston through Huntsville. We have an HF circuit here, and we're not going to - You are not coming back.

HAWAII (REV 106)

Apollo 9, Houston through Hawaii.
Roger. Houston, Apollo 9. Go.
Roger. I have three Hasselblad targets of opportunity this rev, if you think you can get them while you are getting ready for the burn.
Okay. Stand by.
Okay. Go ahead.
Roger. First one: Dallas-Fort Worth; geography; 168 07 01; three frames; 6 seconds. It's south 15 degrees.
Okay.
The Intertropical Convergence Zone; the weather, 168 25 delay that - 168 28 41; three frames; 18 seconds. It's south 40 degrees.
Okay.
The Gulf of Guinea; oceanography, 168 30 37; five frames; 60 seconds; and it's north 50 degrees. Over.
Roger. Understood. 168 07 01; Dallas-Fort Worth, geography; three frames; 6-second intervals; south 15 degrees. 168 28 41; Intertropical Zone; weather; three frames; 18 seconds; south; and I believe you said 40 degrees. Is that correct?
06 23 54 28  CT  Affirmative. South 40 degrees.
06 23 54 31  LMP  Okay. Then 168 37, Gulf of Guinea, oceanography, five frames, and I didn't get the interval on that.
06 23 54 33  CC  Roger. Sixty-second interval.
06 23 54 42  LMP  Roger. Sixty seconds, and north, and I didn't get the degrees on that.
06 23 54 46  CC  North 50 degrees.
06 23 54 50  LMP  Okay. North 50 degrees.
06 23 55 53  CC  We're about 165. I'll have your maneuver PAD in about 2 minutes.
06 23 56 27  CC  Apollo 9, Houston.
06 23 56 30  CDR  Go ahead. Houston, Apollo 9.
06 23 56 39  CC  Roger. We noticed a CFE RESET about 15 minutes ago, and we wondered if you noticed any other glitches or anything.
06 23 56 45  CDR  Stand by one.
06 23 57 00  LMP  Houston, there is nothing that we can think of that we saw abnormal.
06 23 57 05  CC  Roger. And I have your maneuver PAD.
06 23 57 30  LMP  Okay. I'll get the book.
06 23 57 33  CC  Roger.
06 23 57 50  CDR  Okay. Go ahead.
06 23 57 52  CC  Roger. Purpose SPS-7: 169 38 59 30, plus 02270, minus 05900, plus 01650 06533 06366 0250 26772, minus 090, minus 11022 31830 28400, minus 1510, plus 14563 1137. Over.
06 23 59 27  CFP  Roger. SPS-7: 169 38 59 30, plus 02270, minus 05900, plus 01650 06533 06366 0250 26772, minus 090, minus 11022 31830 28400, minus 1510, plus 14563 1137.
07 00 00 21  CC  Apollo 9, Houston. You read back correct.
07 00 00 25  CFP  Roger.
9, Houston. While we have you, we'd like to get some more information on the cabin fan.

Okay, Houston. We haven't run the cabin fans very much. As a matter of fact, yesterday is the only day we ran them. They seemed to make the temperature go up, so when we were shifting the fans around at the end of the day is when we discovered that cabin fan number 1 didn't run and heated up like it did.

Roger. Understand the cabin fan had been on most of the day yesterday, then heated up.

Negative; negative. We were moving the other cabin fan, and we decided to shift fans. When we decided to shift fans, we put on fan number 1, and when we did that, we noticed that there wasn't any sound or wind coming out of the cabin fan area. So we switched back to number 2. I happened to stick my hand in that area to clean out some junk, and I felt that fan housing on fan number 1. It was very hot, so we pulled the circuit breaker on it.

Okay. Now we copy correct. Roger. Thank you.

Roger.

And, Apollo 9, Houston. Request POO in ACCEPT. We'll send you your state vector and target load.

Roger. POO in ACCEPT.
Apollo 9, Houston. I can give you some pointing data here to take a look at your prime recovery area, if you want.

Okay; fine. Go ahead.

Okay. At 168, plus 13, plus 00, with a roll 015, pitch 235, yaw 025, range will be 224 miles, and you'll be pointing right at your prime recovery area.

Alrighty. Thank you.

Apollo 9, Houston. You have state vectors both slots and the target load. Computer is yours.

Roger. Thank you.

And 9, Houston. We've also checked your vector, and it's good.

Very good. Thank you.

Apollo 9, Houston. About one minute LOS Vanguard; Tananarive at 42.

Alrighty, Houston. Tananarive at 42.

Apollo 9, Houston. Standing by, Tananarive.

Apollo 9, Houston. Standing by, Tananarive.

Roger, Houston. Apollo 9 here. Reading you loud and clear.

Roger. Same here.

Apollo 9, Houston.

Go ahead, Houston. Apollo 9.
Roger. In preparation for a possible fuel cell 2 H₂ purge, request H₂ purge line heater on.

Roger, They're on.

Roger.

Apollo 9, Houston.

Go ahead, Houston.

Roger. Request an H₂ purge on fuel cell 2 for 5 minutes, at 169 plus 17, and this is to bring the exhaust temperature down.

Roger. Fuel cell purge for 5 minutes at 169 17.

Affirmative, and this is so we won't get a MASTER ALARM due to the high exhaust during the burn.

HAWAII (REV 107)

Apollo 9, Houston through Hawaii. I can give you a time hack at 16 minutes.

Roger, Houston. Apollo 9, standing by.

4, 3, 2, 1.

MARK.

Sixteen minutes.

Okay. We're right with you.

Apollo 9, Houston.

Go ahead, Houston. Apollo 9.

Roger. You're looking great down here. You have a GO for SPS number 7.


Affirmative.
**APOLLO 9 AIR-TO-GROUND TRANSCRIPTION**

(TAPE 106/1)

**MILA (REV 108)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 01 37 23</td>
<td>CC</td>
<td>Apollo 9, Houston. You're still looking good. Standing by.</td>
</tr>
<tr>
<td>07 01 37 27</td>
<td>CDR</td>
<td>Roger. Houston, Apollo 9.</td>
</tr>
<tr>
<td>07 01 39 46</td>
<td>CMP</td>
<td>Houston, Apollo 9. Have you got the residuals off the DSKY?</td>
</tr>
<tr>
<td>07 01 39 49</td>
<td>CC</td>
<td>Apollo 9, Houston. I have the residuals.</td>
</tr>
<tr>
<td>07 01 39 51</td>
<td>CMP</td>
<td>Roger. We're at the attitude, and the EMS DELTA-V counter is minus 17.5.</td>
</tr>
<tr>
<td>07 01 39 57</td>
<td>CC</td>
<td>Minus 17.5</td>
</tr>
<tr>
<td>07 01 40 35</td>
<td>CC</td>
<td>You, Houston. We have your orbit 253.1 by 97.9.</td>
</tr>
<tr>
<td>07 01 40 39</td>
<td>CMP</td>
<td>Roger. It's pretty smooth, too.</td>
</tr>
<tr>
<td>07 01 40 42</td>
<td>CC</td>
<td>Good.</td>
</tr>
<tr>
<td>07 01 40 48</td>
<td>CMP</td>
<td>Like an arrow in the sky.</td>
</tr>
<tr>
<td>07 01 40 51</td>
<td>CC</td>
<td>Beautiful.</td>
</tr>
<tr>
<td>07 01 40 53</td>
<td>LMP</td>
<td>You know, after all these days up here in zero g we're not accustomed to these high g's like 0.8 g's.</td>
</tr>
<tr>
<td>07 01 40 59</td>
<td>CC</td>
<td>(Laughter)</td>
</tr>
<tr>
<td>07 01 41 32</td>
<td>CDR</td>
<td>Houston, where are we right now?</td>
</tr>
<tr>
<td>07 01 41 42</td>
<td>CC</td>
<td>Roger. You're over Mila now.</td>
</tr>
<tr>
<td>07 01 41 45</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>07 01 44 26</td>
<td>CC</td>
<td>You, Houston. Everything looks real good down here. Looks like we will have you here for about 8 more minutes.</td>
</tr>
<tr>
<td>07 01 44 29</td>
<td>LMP</td>
<td>Okay. Very good.</td>
</tr>
</tbody>
</table>

**ANTIGUA (REV 108)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 01 48 14</td>
<td>CDR</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>07 01 48 16</td>
<td>CC</td>
<td>Houston. Go.</td>
</tr>
</tbody>
</table>
Listen. I never was able to get the spacecraft over in the right attitude to look at the weather as we went by before, so I'm afraid I can't tell you what the weather is. Besides which, I didn't want to terrify myself for seeing how bad it really was.

Roger. That's all right. It's going to get better, anyhow.

Okay.

Now that we have performed our day's work, we are back eating again.

Okay. Good.

9, Houston.

Go.

Hey, while you are eating your lunch there, I might read to you what the astrologers say about your day. This is for both Jim and Dave. You must learn to listen well. Don't get into any disagreements today and group activity is preferable tonight.

Well, we'll try - (laughter) - We'll try, Ron.

Okay.

Hey, is three considered a group?

Stand by. This is Rusty's. Be selective in choosing your friends. Get any new scheme moving promptly.

I got a new scheme moving promptly this morning.

Okay.

I think he may have a little trouble choosing his friends for a couple of days.

That's right.

Hey, did they have any more good basketball games last night?

Roger.
07 01 50 54 LMP How far along are they in the playoffs for the basketball championships?

07 01 51 01 CC Roger. Copy. Just a second.

07 01 51 12 CC 9, Houston. Request a readout of the FUG3 gages and the imbalance meter.

07 01 51 19 LMP Okay. Oxidizer is 9.2, and the fuel is 5.0, and the imbalance is FULL SCALE HIGH - That is FULL SCALE on the increase.

07 01 51 27 CC Roger. Was the fuel 9.0?

07 01 51 31 IMP 9. - I'm sorry. Fuel was 5.0, oxidizer 9.2.

07 01 51 38 CC Roger. Fuel 5.0.

07 01 51 39 LMP That's affirmative.

07 01 52 10 CDR Hey, Mr. Evans. I have a little bit of news for you.

07 01 52 13 CC Roger. Go.

07 01 52 15 CDR Do you realize that that was the 17th propulsive maneuver that we have performed on this flight - not counting the S-IC, the S-II, the three S-IVB's, and the APS burn to depletion.

07 01 52 30 CC That's right, by golly.

07 01 52 34 CDR See. Don't we have a lot of useless data up here?

07 01 52 35 CC (Laughter)

07 01 52 45 CC Antigua at - Ascension at 58.

07 01 52 50 CDR Okay.

ASCENSION (REV 109)

07 02 00 25 CC Apollo 9, Houston through Ascension.

07 02 00 28 LMP Roger. You're five-square, Houston.

07 02 00 30 CC Roger. Read and clear. That Miami and Notre Dame game was one of the playoff games. The playoffs are on now. We'll get some more scores for you when we get some.
Okay. Very good.

The USC/UCLA game wasn't a playoff game, was it?

Negative. That was a conference game.

Okay.

Did the University of Houston get in the playoffs?

I'm not sure. San Jacinto State beat Tyler here in the first game of the Texas playoffs for the national championship.

Oh.

Apollo 9, Houston. We'd like to verify the H₂ purge-line heater is off.

That's verified, Houston.

Roger. Thank you.

Houston, 9.

Houston. Go.

Roger. What's our inclination following that burn, please?

Roger. Stand by one.

9, Houston. Your inclination is 33.54 degrees.

Okay. Understand 33.54. Thank you.

Apollo 9, Houston. One minute LOS. Tananarive at 15.

Roger. Tananarive 15.

Apollo 9, Houston through Carnarvon.

Roger, Houston. Read you five-square.

Roger. I have an S065 update.
LMP 07 02 30 38 Okay. Go ahead. We're ready to copy.

CC 07 02 30 40 Roger. Inertial angles 180 00, 181 20 all zips. GTT is 171 24 00. Your T-align was 170 48 00. It's orb rate, and the rate is 0.066 degrees per second. Your orb rate fall angles, 180 327.5 and 0. The site is the Amazon River mouth 171 29 26 20 and 03.

LMP 07 02 32 05 Okay. Is that 21, Ron?

CC 07 02 32 08 Roger. I have some more brief data for you. Just the one on this one here.

LMP 07 02 32 14 Okay. Go ahead with your orb rate data.


LMP 07 02 32 51 Okay. Understand. 180 00, 181 20, all zips. 171 24500 170 48 00; orb rate 0.066 degrees per second. Local vertical angles 180, 327.50, Amazon River mouth 171 29 26 20 03, and Victor through Zulu: 00002 14175, all zips, 11546 and 54621.

CC 07 02 33 30 Apollo 9, Houston. Your readback is correct, and I've got some sequence camera stuff for you.

LMP 07 02 33 38 Okay. Stand by one.

CDR 07 02 33 51 Go ahead.

CC 07 02 33 52 Okay. It's a high oblique to the north sweeping across the United States.

CC 07 02 34 04 Sequence camera, 75 mm lens, six frames per second, and you'll be using CEX 368 film. You'll start at GET 171 plus 11 plus 38 to 171 plus 19 plus 16. Over.

CDR 07 02 34 48 Roger. High oblique to the north sweeping across the U.S., sequence camera, 75mm lens, six frames per second, CEX 368, beginning 171 11 35 to 171 19 16. We may have a little problem there because to point way out to the north there we are going to get in gimbal lock - we'll - If we point out 45 degrees or so, we'll be able to hack it for you.

CC 07 02 35 17 Roger. That'll be mighty fine.

CDR 07 02 35 22 All right.
GUAM (REV 109)

07 02 45 49  CC  Apollo 9, Houston through Guam.
07 02 48 52  LMP  Roger. Go ahead, Houston.
07 02 43 54  CC  Roger. I have your libration points if you feel so inclined.
07 02 49 05  LMP  Yes. The ones that I wanted - by the way, Ron - were the ones for the moon-earth/moon libration point.
07 02 49 12  CC  That's affirmative. That's what we gave you.
07 02 49 16  LMP  Okay. Good.
07 02 49 18  LMP  Go ahead.
07 02 49 20  CC  Okay. Number 1 - and this is all at 172 hours - number 1, right ascension 12 hours 46 minutes, declination minus 6 degrees 13 minutes; number 2 is at 20 hours 16 minutes, declination minus 22 degrees 15 minutes.
07 02 49 58  LMP  Okay. Number 1 at 12 hours 46 minutes, minus 6 degrees and 13 minutes; number 2, 20 hours 46 minutes, declination minus 22 degrees and 15 minutes, and those are good for 172 hours.
07 02 50 13  CC  Roger. And number 3 turns out to be up around by Spica; number 2 is down in the Cadillac V.
07 02 50 23  LMP  Okay. Thank you.
07 02 50 47  CC  9, Houston. We will have you at Hawaii at 58.
07 02 50 53  CMP  Roger.
07 02 50 54  CC  And be advised that you have turned 10 515 feet per second DELTA-V in the IM and GSV.
07 02 51 06  LMP  Roger.
07 02 51 08  CDR  Roger.
07 02 51 10  LMP  Hey, do we get . . .
07 02 51 11  CC  Say again.
07 02 51 16 LMP Do we get a pin for the 10,000 club?
07 02 51 18 CC Hey, that's right. How about that?

HAWAII (HEV 109)

07 03 00 07 CC Apollo 9, Houston through Hawaii. And it looks like we'll have you all the way through Antigua until about 23.
07 03 00 17 CDR My goodness — what a long pass.
07 03 00 20 LMP Roger, Houston. Understand. Hey, we have got another little thing you can work on — for those libration points. I wonder if you could give us the one-half unit vectors for those, and we could use AUTO optics.
07 03 00 31 CC Roger. One-half unit vectors. We'll see if we can't work them out for you.
07 03 00 35 LMP Okay. Thank you.
07 03 04 25 CDR Houston, Apollo 9.
07 03 04 31 CC Apollo 9, Houston. Go.
07 03 04 34 CDR Roger. We need a little more detail on this string of 75-millimeter - 16-millimeter movies we are going to take here. How far out — How far below the horizon do you want the picture taken, or how far out from the track do you want it taken? We need some angle to point the camera.
07 03 04 52 CC Okay. Understand.
07 04 05 27 CC Apollo 9, Houston.

END OF TAPE
Apollo 9, Houston.

Apollo 9, Houston.

Apollo 9, Houston.

Houston, 9.

Roger. Read you loud and clear now, 9. On this pointing angle you want about 45 to 60 degrees above the nadir.

Forty-five to 60 degrees above the nadir.

Affirmative.

Okay. Thank you.

Houston, this is Apollo 9.

Apollo 9, Houston. Go.

Roger. We are getting an awful lot of pictures of clouds here. Do you want to use the film on clouds?

Roger. We copy. I'm getting a reading from the back room there.

Okay.

Keep clicking away.

Okay. Will do.

Houston, Apollo 9.

Houston. Go.

Roger. It's just about time for us to stop this thing now. We're coming across the southern tip of Florida, the Keys, and the southern tip of Cuba. I think we'll let it keep running here. And it looks like we are finally getting out of the clouds.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 03 19 27</td>
<td>CC</td>
<td>Hey, mighty fine. Continue.</td>
</tr>
<tr>
<td>07 03 19 30</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>07 03 19 38</td>
<td>CC</td>
<td>You might be advised that this is one of the rare times that the mouth of the Amazon is supposed to be without clouds down there, so that is why we are trying to get that one this time.</td>
</tr>
<tr>
<td>07 03 19 46</td>
<td>CDR</td>
<td>Great. Okay. You want some Hasselblad 70-millimeter standard stuff, too?</td>
</tr>
<tr>
<td>07 03 19 53</td>
<td>CC</td>
<td>Okay. You can throw some of them in there if you can get it while you are getting the S065.</td>
</tr>
<tr>
<td>07 03 19 57</td>
<td>LMP</td>
<td>Oh, man, we're versatile. We can take pictures out of four or five windows at the same time.</td>
</tr>
<tr>
<td>07 03 20 01</td>
<td>CC</td>
<td>Beautiful.</td>
</tr>
<tr>
<td>07 03 20 03</td>
<td>CMP</td>
<td>You wouldn't believe the amount of gear we have got in here.</td>
</tr>
<tr>
<td>07 03 22 11</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>07 03 22 14</td>
<td>LMP</td>
<td>Go, Houston. Apollo 9.</td>
</tr>
<tr>
<td>07 03 22 16</td>
<td>CC</td>
<td>Roger. I wonder if you could tell us if the FDAI is in 1/2, and if ball 1 is in orb rate at this time.</td>
</tr>
<tr>
<td>07 03 22 27</td>
<td>LMP</td>
<td>The FDAI is in 1/2 and ball 1 is not in orb rate; it's inertial. And ball 2 is in orb rate.</td>
</tr>
<tr>
<td>07 03 22 31</td>
<td>CC</td>
<td>Roger. Thank you.</td>
</tr>
<tr>
<td>07 03 23 33</td>
<td>CDR</td>
<td>Houston, 9.</td>
</tr>
<tr>
<td>07 03 23 36</td>
<td>CC</td>
<td>Houston, go.</td>
</tr>
<tr>
<td>07 03 23 37</td>
<td>CDR</td>
<td>Roger. We just let the 16mm run all the way down. Just by coincidence it went right down the chain of islands and just went right through the middle of the tongue of the ocean back there.</td>
</tr>
<tr>
<td>07 03 23 48</td>
<td>CC</td>
<td>Roger. We copy that.</td>
</tr>
</tbody>
</table>
This is the Apollo 9 travel log.

Right.

Apollo 9, Houston. I have those half-unit vectors there if you have somebody that can copy them.

I guess we're all taking pictures. Can you stand by?

Sure. We'll catch you at Ascension.

Okay.

ASCENSION (REV 10)

Apollo 9, Houston through Ascension.

Roger, Houston. Go.

Roger. Do you want those unit vector things?

Go ahead.

Roger. \( \frac{1}{2} \), \( \frac{3}{4} \), minus 0.09910; \( \frac{1}{2} \), minus 0.05411, \( \frac{1}{2} \), minus 0.09910, \( \frac{1}{2} \), plus 0.30664, minus 0.34699; \( \frac{1}{2} \), minus 0.16932. (over.

Roger. Minus 0.18708, minus 0.09910, minus 0.05411, plus 0.30664, minus 0.34699, minus 0.16932.

Apollo 9, Houston. Your readback correct.

Houston, I'm afraid it looked like the Amazon was cloudy again today, but we took the pictures anyway.

Okay.

And it also looked like we were slightly off the coast and not directly over the Amazon – or the mouth of the Amazon.

Okay. Understand. It's really where we wanted it to be, so —

Okay. Well, we got some Hasselblad of the mouth, too.
(COSS NET 1)

07 03 38 35 CC Okay. Good.
07 03 42 43 CC Apollo 9, Houston. Tananarive at 51.
07 02 42 47 CHP Roger. Tananarive at 51.

TANANARIVE (REV 109)

07 03 57 21 CC Apollo 9, Houston through Tananarive. Do you read well enough for three targets of opportunity update?
07 03 57 41 LMP Houston, Apollo 9. We read you five-square. Go ahead with the updates.
07 03 57 47 CC Roger. Costa Rica, active volcano: geology, weather; 17° plus 58 plus 00, three frames, 10 seconds apart, on track. Target: west coast, Columbia, weather, 17° plus 80 plus 40, ten frames, 10 seconds apart, on track. Target: Brazil, Rio Madera, geology, weather, 173 plus 63 plus 54, six frames, 10 seconds, on track. Over.
07 03 59 22 LMP Okay. How do you read, Houston?
07 03 59 25 CC Not too well.
07 03 59 29 LMP Okay. You want a readback, or you want to save it?
07 03 59 32 CC We'll save then.
07 03 59 35 SC Okay. We'll talk to you next station.
07 03 59 39 CC Roger. It'll be at Carnarvon at 07.

CARNARVON (REV 109)

07 04 09 04 CC Apollo 9, Houston through Carnarvon.
07 04 09 06 LMP Roger. ... Go ahead.
07 04 09 14 CBR Go ahead. Houston, Apollo 9.
07 04 09 15 CC Roger. I have your COSS update, and then you can give me the targets of opportunity if you want.
07 04 09 24 CHP Roger. Ready to copy.
Okay. Inertial angles 180 00 218 30, all zips, 172 46 00 172 19 00. It will be orb rate, your orb rate ball angles are the same as before: 180, 327.5, and 0. The site: Toluca, Mexico, 172 52 08 08 04. And that's the only one.

Okay. And are Victor through Whiskey, or Victor through Zulu the same as before?

That is affirmative. And we are double checking them and all that and will let you know if there's any difference.

Okay, then. On the readback, 180 218 30, and all zips, 172 46 00 172 19 00, orb rate; got the local vertical ball; the target is Mexico 172 52 08 08 04.

Roger. Your readback is correct.

Okay. And I will give you those other ones also.

Okay. Go.

Okay. I didn't get where the first site was. The time was 172 57 00, three frames, 10 second DELTA-T, active volcano and weather. And must be somewhere in Mexico or around there.

Affirmative. It's in Costa Rica. And about 5 days ago, the lava flow was about 3 miles by a half a mile.

Okay. See if we can't get that one. Next one was 172 59 40, target was the west coast of Columbia, ten frames at 10 second intervals; 173 03 54, Brazil, geology and weather, six frames and 10 second DELTA-T. And the last two were on track. How about the volcano?

Affirmative. Volcano is on track also.

Okay. Thank you.

Houston, Apollo 9.

Apollo 9, Houston. Go.

Roger. Since that active volcano is right on track there, I wonder if the CCO guy would want a picture of an active in their little cameras?

We're checking on it to see.
Apollo 9, Houston through Guam.

Roger, Houston.

Roger. Apollo 9, Houston. It's pretty well weathered-in down there, but we want to see what the IR film will do on this SO65, so I have the data for that.

And I'm talking about the volcano.

You were cut out on that last one, Ron. Go ahead now.

Okay. On the volcano - it looks like it's partially - a pretty well cloud cover, but we'd still like an S-45 pass on it. I have that data.

Okay. Stand by just one.

Wilco.

Okay. Go ahead.

Roger. The sight is the volcano at 2° 57' 00" 10 and 03. Over.

Okay. Volcano 2° 57' 00" 10 03.

Roger. Copy correct.

Houston, 9.

Houston, Go.

Roger. If you've got another map update, we'd appreciate that.

Roger.

Here we go - REV 109, at 2° 17' 35" right ascension 15° 45', longitude 123.6 east. Over.

Okay. REV 109, 2° 17' 35", 15° 45' right ascension, and 123.6 east.

9, Houston. That's correct. And I have some block data we can start reading it on here and continue it through ARIA.
07 04 25 31 CDR Stand by, just one.
07 04 25 39 CC Will do.
07 04 25 43 CDR Okay. Stand by.
07 04 25 44 CC Okay. Apollo 9, Houston, plus 268, minus 1600 175
29 41 268, minus 123 Bravo, plus 268, minus 1465 176
53 09 plus 1133 plus 3 Alfa, plus 1440 178
32 27 31 plus 3 Charlie, plus 1410 180
04 19 315 115 Charlie Charlie minus 268, minus 1610 185 49 816; and we've pulled out to have
LOS here. We've got a COMM through ARIA.
So I'll say it.
07 04 28 04 CDR Roger.
07 04 28 35 CC ARIA 1, Houston: CAP COMM. Go to VHF up.

ARIA 1

07 04 28 55 CC Apollo 9, Houston through ARIA.
07 04 29 06 SC ... 
07 04 29 04 CC Apollo 9, Houston. I don't read very well.
How are you?
07 04 29 10 CMP I'm ready, you ...
07 04 29 21 CC Apollo 9, Houston. I don't know you at all
for this part of it. How is spread, and
then we're not talking, how much noise is in
the background?
07 04 29 43 IMP Okay. Houston. How do you read into 9 now?
07 04 29 47 CC Roger. We're weak but clearer sentence.
07 04 29 52 IMP Okay. We're coming through language by
three, 9, then you do not transmit. It is very
little use. It is some but not transcribable.
07 04 30 05 CC Roger. Say that. And now, Apollo 9, turn your
S-band tone up. ARIA 2, reme-coil up.
07 04 30 29 CC Apollo 9, Houston. How do you S-band?
07 04 30 34 IMP Five-squared. It's beautiful 9.
07 04 30 37 CC Okay. We are about four by four here. Let's
continue the tone, and we've pulled one back.
C4 30 47  WE  Ready to 2.
C4 30 49  WE  Roger.  Approaching Charlie, plus 049, minus 0320 182. 177 2 Charlie, plus 222, minus 0306 01 01 01 01; 118 2 Alfa, plus 298, minus 067; 116 3 Charlie, minus 1.41.  See pitch trim. minus 1.41. 1.41. Over.
C4 31 26  DCA  Okay.  Approaching for the readback?
C4 31 28  WE  Affirmative.  We are about 3 minutes for readback.
C4 31 32  WE  Okay.  We are up pretty fast.  114 4 Alfa, plus 068, minus 0314 176 55 09 39; 112 3 Bravo, plus 233; 110 3 Charlie, plus 178 32 27 3790. 114 3 Charlie, plus 224; 112 3 Charlie, plus 046 08 1834; 115 3 Charlie Charlie, plus minus 1610 182 01 49 3196; 110 Alfa, minus 049, minus 0320 182 21 01; 4982; 111 4 Bravo, plus 222, minus 0270 183 59 15 3602. 118 44 minus 293, minus 0300 185 37 27 3289; minus 0.38; yaw, minus 1.41. Over.
C4 34 19  WE  Hello.  Beautiful job, and what kind of a noise do you hear when I'm not transmitting now?
C4 34 27  WAC  None at all.  Sounds like a whistle.
C4 34 31  WE  Okay.  And you're getting a little bit of noise down there.  Not bad at all.  We should hand over with enough data, and then we'll pick you up on run.
C4 34 47  WE  Roger.
END OF TAPE
APOLLO 9 AIR-TO-GROUND TRANSCRIPT

GUAYMAS (REV 110)

07 04 53 20 LMP Hey, Houston.
07 04 53 23 CC Houston. Go.
07 04 53 24 LMP Roger. That first site over there was terrific; big volcano down there, and it was in the only clear area in the whole sector.
07 04 53 33 CC Say. Real beautiful.
07 04 53 37 LMP We even took one extra, another one. In fact, two extra. You might want to log them.
07 04 53 40 CC Okay. We have that.
07 04 53 42 LMP And we got some Hasselblads with us.
07 04 53 46 CC Roger. Real good.
07 04 54 15 CC Apollo 9, Houston. About 15 meters. We'll pick you up at Tananarive at 22.
07 04 54 20 LMP Okay --
07 04 54 21 LMP -- Okay.

TANANARIVE (REV 110)

07 05 12 28 28 CC Apollo 9, Houston through Tananarive.
07 05 12 30 41 CC Apollo 9, Houston through Tananarive.
07 05 12 30 55 CT CAP COMM, uplinking properly through Tananarive.
07 05 13 02 CC Roger. And, 9, I've got some more target updates here, but I can't hear 'em at all yet.
07 05 13 12 LMP We're reading you reasonably well. How are you reading us now?
07 05 13 17 CC Roger. I can't make it out. I can't read you good enough to read up the updates.
07 05 13 44 LMP Go ahead, Houston, with your updates.
Okay. Apollo 9, Houston. Here we go. Bonin Islands; weather, 174 plus 01 plus 14, four frames, 10 seconds, on track. Galapagos Islands; weather, 174 plus 32 plus 38, four frames, 8 seconds, on track. Lima, Peru; weather, oceanography, 174 37 03, 18 frames, 12-second intervals, on track. The next one is in your rest period and not required unless you can get it. Japan volcanos; geology, meteorology, 175 36 07, seven frames, 30-second intervals, at north 32 degrees. Over.

How do you read?

Roger. Got you now.

Okay. 174 01 14, weather, four frames, 10 seconds, on track. 174 32 38, Galapagos, weather, four frames, 8 seconds, on track. 174 37 03, Lima, weather and oceanography, 18 frames, 12 seconds, on track. 174 36 07, Japan, volcanos, weather, seven frames, 30 seconds, north 32 degrees.

Apollo 9, Houston. Readback correct.

The can was ... on the 70-millimeter Hasselblad and we've lost about 50 frames of film on a jammed track.

Roger. One pack is jammed; 50 frames are lost.

Apollo 9, Houston through Guam.

Hello, Houston. Apollo 9.

Roger. We have the state vector to shoot up to you, if you have POO in ACCEPT.

Okay. Stand by one. Finally got the old sun filter on, and it works pretty good. I can count about 15 sun spots.

Oh, okay. We can get this state vector over Hawaii if you're using it. No problem.

Okay. Why don't we do that?

Okay.
O7 05 58 40  CMP  I'm learning about the sun.
O7 05 58 48  CC  9, Houston. I've got some more things I'd like
to discuss with you here, though. And we're
requesting both O₂ cryo heaters to AUTO; that's
oxygen cryo heaters to AUTO.
O7 05 59 06  CDR  Okay. Do you want that done right now?
O7 05 59 09  CC  Sometime; yes.
O7 05 59 10  CDR  Okay. Both O₂ cryo heaters to AUTO at this time.
O7 05 59 13  CC  Roger. And cryo plan is essentially the same as
the last two nights, except that we'll have H₂ tank
fan on.
O7 05 59 31  CDR  Okay. You're going to let the oxygen and the
hydrogen pressure dribble down to between 190 and
200, and then we go to bed, we want H₂ tank 2 fan on.
O7 05 59 42  CC  That's affirmative. And the same type of power-
down: RCS OFF; RCS OFF; RCS OFF; RCS OFF; RCS OFF; RCS OFF;
everything else powered up.
O7 05 59 59  CDR  Okay. Very good. And let's not, what our heaters -
You want inverter 3 on MAIN A, also?
O7 06 00 05  CC  Affirmative. Just before you go to - hit the rack.
O7 06 00 09  CDR  Okay. Fine.
O7 06 00 11  CC  And, if you have to purge fuel - purge to get the
H₂ down, it may take a long time to get it down
just through fuel cell 2, so you can use your
discretion and purge all three if you want to.
O7 06 00 25  CDR  Okay. Thank you.
O7 06 00 46  CC  9, Houston.
O7 06 00 48  CDR  Go ahead.
O7 06 00 49  CC  Roger. We would like a readout on your battery
manifold pressure, system test 4 ALPHA. And have
you been venting it periodically or not?
07 06 01 03 IMP No, we haven't been venting it periodically.
07 06 01 07 CC Roger. Don't vent it; just give us a readout then.
07 06 01 15 IMP Okay. 1.2 volts.
07 06 01 17 CC Roger. Copy.
07 06 01 19 CC Apollo 9, Houston. When I called you about the FDAI
SELECT and orb rate, was the attitude SEP switch in
COC or IMU?
07 06 01 38 CMP Oh, I'm not sure. We've reconfigured a few times.
Right now the attitude SEP switch is in IMU.
07 06 02 07 CC Okay. Understand it's in IMU now, and it more than
likely was at that time.
07 06 02 12 CMP Yes. That's probably right. Yes.
07 06 02 27 CC And, 9, Houston. We'll have another ARIA check at 06.
07 06 02 32 CMP Okay.

ARIA (REV 110)

07 06 06 26 CC ARIA 2, Houston CAP COMM. Remote VHF up.
07 06 06 46 CC Apollo 9, Houston through ARIA 2. VHF.
07 06 06 52 IMP Houston, Apollo 9. How do you read?
07 06 05 54 CC Hey, that's beautiful this time. How me?
07 06 05 59 CMP You're about the same. It sounds like a little bit
of ... You're clear, though.
07 06 07 05 CC Okay. Very good. While we have you here, I have
a consumables update if you'd like to copy that.
07 06 07 16 CMP Okay. Stand by one.
07 06 07 31 SC Okay. Go ahead.
07 06 07 33 CC Okay. At 173 43 10 43 12 47 13 44 13 30 22 32
28 39. And I've got some notes here for you.
07 06 08 12 CMP Okay. You're evidently cutting in and out because
I ended up with one button left and no button holes.
Okay. We're just about ready to switch to S-band. We'll try S-band now; so S-band volume UP. S-band volume UP, and ARIA 2 remote S-band.

Apollo 9, Houston. How do you read S-band?

You're weak on S-band. How do you read us?

Roger. About the same. A little weaker on S-band.

Okay. Try it - we just - we're back into the noise depletion.

Okay. Apollo 9. I think it's a function of how the stuff gets from us to you and not from ARIA to you.

Apollo 9, Houston. How do you read now?

That's a little better, Houston.

Okay. That's a lot better. What didn't you get on the consumables there?

You're breaking up pretty bad, Houston.

Okay. Understand I'm breaking up pretty bad. We'll pick you up Hawaii about 12, in 2 minutes.

Houston, if you read us, you're coming through very, very garbled. We're unable to read you.

Apollo 9, Houston. Understand I am garbled.

END OF TAPE
HAWAII (REV 110)

07 06 12 28 CC Apollo 9, Houston through Hawaii.
07 06 12 32 CDR Roger, Houston. We’re reading you five-square now. That last check wasn’t too good on the S-band.
07 06 12 39 CC Roger. We concur on that also. I was reading you most of the time, but it was way down in the mud.
07 06 12 47 CDR Yes. We could tell you were talking, but we were unable to read anything on the S-band that time. I think I read a couple of words one time, and it degraded again.
07 06 12 55 CC Okay. And request FOC in ACCEPT, if you haven’t done it. We don’t quite have the data yet.
07 06 13 04 CMP Okay. We have FOC in ACCEPT.
07 06 13 06 CC Roger.
07 06 13 10 LMP And I guess you read that I ran out of — Actually, I had a couple of slots left over when we finished that consumables update.
07 06 13 21 CC Okay. Before I start it again, as soon as we get a good data lock on here, I’d like to have you take the attitude set switch to GDC to STANDBY.
07 06 13 35 CDR What are you asking us to do?
07 06 13 37 CC STANDBY for attitude set switch to GDC.
07 06 13 44 CDR Okay.
07 06 13 48 CC Okay. We’ve got a keyhole there, so I’ll go ahead and read up the consumables plan again. It’s at 173 hours 43 10 43 12 47 13 44 13 305 22 32 28 39.
07 06 14 30 UAP Roger. 173, 43 10 43 12 47 13 44 13 305 22 32 28 37.
07 06 14 45 CC Roger. That’s correct, and I’ve got some notes here.
07 06 14 50 CMP Okay. Ready.
07 06 14 55 CC Okay. Tomorrow we will use quad Bravo and Charlie. Alpha and Zero will be off just as today. SPS DELTA-V capability 1143 feet per second. SPS burn time 40 seconds. Service module FAP redlines 25 31 34 34. Over.
Okay. Tomorrow you want us to use Beta and C; Alfa and Delta off as today. SPS DELTA-N capability 1143 feet per second. SPS burn time capability 40 seconds. Service module PAP redlines 25 31 34 34.

Roger. That's correct.

We're about LOS here. Redstone at 17.

---

Royal 9, Houston through Redstone.

Apollo 9, Houston through Redstone.

Roger, Houston. Go ahead.

Roger. Just clean up a few items around here. I guess you still owe to the waste water dump, and you know there's no battery charge tonight. And you still owe us the standard spacecraft readout, powerdown readout, and dosimeter reading.

And, Apollo 9, Houston. I guess the canister change. Just a reminder there.

Houston.

Houston. Go.

Roger. The CDR has a dosimeter reading of 3115.

Roger. Copy.

LMP is 8016.

Roger. Copy 8016.

And 6116.

Hey, Houston. Did you get the third one: 6116?

9, Houston. Say again.

Roger. The CMP is 6116.

Roger. 6116.
Apollo 9, Houston. Request attitude set switch to GDC and give us a Mark.

Roger. Have set switch going to GDC on my Mark 3, 2, 1.

Roger. Thank you.

What are you guys doing with that switch?

Okay. We've got out TM readout on an IMU pitch resolver that showed a little bit of change, and it's strictly a TM thing that goes into our computer here, and it's a functional whether your switches are.

Nothing in the spacecraft at all.

All right. Thank you.

And Clair is sitting up there in the back and she says on the basis of your rendition of "Happy Birthday," the Bay Area Chorus would like to extend an invitation to the crew to audition for a trio at a spring concert.

That's what I said too.

Wonder what kind of food they serve.

(Laughter)

Hey, Houston, you through with the computer?

Affirmative. Computer is yours.

Okay.

And just to verify that you got the word. No battery charging tonight.

Real fine. No battery charging tonight.

Houston. We know that you had a couple of MASTER ALARMS last night during youraste water dump, and we're trying to confirm that these were due to a night cold. Can you confirm that?
07 06 24 53  CMP  Roger. That's correct.
07 06 24 55  CC  Roger. Thank you.
07 06 25 00  CDR  We've got so many MASTER ALARMS here it looks like the simulator.
07 06 25 03  CC  Oh great.
07 06 25 23  IMP  Houston, you still with us?
07 06 25 30  CC  Houston. Roger. Go.
07 06 25 46  CC  Roger. Copy. Thank you.
07 06 26 23  CC  We're just about LOS. Have a good night.
07 06 26 30  LMP  Okay. We can give you some more stuff here.
07 06 26 01  CC  Go.
07 06 26 04  LMP  Okay. C Charlie is 5.0. All the rest are FULL SCALE HIGH on the injector tests.
07 06 26 09  CC  Roger. And confirm omni Bravo if possible.
07 06 26 14  LMP  Omni Bravo.
07 06 26 17  CDR  Okay, Houston. This is Apollo 9. We're going for awhile so if you want to give us a call.
07 06 26 21  CC  Okay. Will do. Thank you very much.

TANANARIVE (REV 110)

07 07 05 17  CC  Apollo 9, Houston.
07 07 06 07  CC  Apollo 9, Houston.
07 07 06 34  CDR  Houston, Apollo 9.
07 07 06 36  CC  Hey, Apollo 9. Houston here. You rest during the night; the night watchman is on duty.
07 07 06 46  CDR  Are you the night watchman on duty?
07 07 06 48  CC  Roger.
We noticed that you went out of range that your DSE probably wasn't running, so we'd like for you to switch the uplink telemetry command switch to RESET and then back to NORMAL.

All, say that one again. You say you want the up telemetry command set to RESET and then back to NORMAL. When do you want that?

Roger. Apollo 9. That's affirmative, and you can do that now.

Okay. Going to COMMAND RESET and back to NORMAL.

Roger.

Hello, there, Mr. Worden.

Hello, Mr. McDivitt.

How are you?

I'm fine, sir. How are you?

I'm fine, too.

Are you ready for ...

Say again.
REDSTONE (REV 115)

07 07 54 25 IMP Houston, Apollo 9.
07 07 54 26 CC Apollo 9, Houston. Go.
07 07 54 31 CDR Roger, Houston. Apollo 9 here. I just wanted to call you and tell you we had a very nice view of Hawaii as we went across it.
07 07 54 38 CC Very Good.
07 07 54 44 CC Why don't you go ahead and remind him --
07 07 54 46 CDR We tried to take a few pictures for the folks down on the ground.
07 07 56 48 CC Roger, Jim. Hey, did you guys put inverter 3 on MAIN A as part of the powerdown?
07 07 54 54 CDR No. We haven't done that yet.
07 07 55 01 CC Okay. We just wanted to remind you of it.
07 07 55 06 IMP Okay. We are going to do it now, Al, so we won't forget it.
07 07 55 08 CC Okay, Rusty.
07 07 55 09 IMP And we were just talking about - We have to turn the tank 2 hydrogen fan on and to turn that inverter on yet.
07 07 55 13 CC All right.
07 07 55 14 CDR -- what the hydrogen looks like.
07 07 55 17 CC Roger. Understand. Guess you will purge a little more, too?
07 07 55 21 CDR Yes. The pressure is way up today. It still reads about 212, 222, or 224.
07 07 55 29 CC Understand that is because we were real good to you and let you sleep an extra 3 hours this morning.
07 07 55 34 RXD Hey, you guys are so good, I can't believe it.
07 07 55 39 CC Well, we are thinking only of you.
07 07 55 41 CDR I know. And we are thinking only of you.
(GOSS NET 1)  

07 07 55 46  CC  I'm going to start calling you sweet lips.
07 07 55 50  CDR  No thanks.
07 07 55 52  LMP  You wouldn't call him sweet lips if you could see him!
07 07 55 57  CDR  Hey, Al, would you do me a favor?
07 07 55 59  CC  Sure.
07 07 56 00  CDR  Call my kids and tell them that I'm really growing a fancy beard for them.
07 07 56 05  CC  Okay. I'll do that.
07 07 56 08  CDR  Tell them I still can't bring it home for them, because I have to shave it off when we get on board the ship. But tell them I'm going to have some pictures of it for them.
07 07 56 15  CC  Okay. I understand. I understand that shaving it off, too. You're a real full-blown Colonel up there.
07 07 56 23  CC  Got to shave that beard off before you get onboard, huh?
07 07 56 28  CDR  No; not before I get onboard, after I get onboard. I have enough beard to be proud of; I don't have to shave mine off ahead of time. But it is anything but fancy.
07 07 56 38  CC  Don't want to mention any names, do you.
07 07 56 42  CDR  Yes.
07 07 59 02  CC  Apollo 9, Houston. Guess you are going over the hill. See you guys in the morning.
07 07 59 15  CDR  Okey-doke. Night-night.
07 07 59 19  CMP  -- Night.
07 07 59 21  CC  Night-night.
07 07 59 22  CMP  What time is morning, Al?
07 07 59 25  CC  Just a second; let me check. It's getting a little confused. It looks like it will be 054 plus 20.
07 07 59 36  CMP  Okay. Thank you.
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
HONEYSUCKLE (REV 117)

07 17 19 49 CC Hello. Apollo 9, this is Houston. Anybody up there got their S-band up?

07 17 20 07 CC Apollo 9, this is Houston. How do you read?

MERCURY (REV 117)

07 17 29 53 CC Good morning, Apollo 9.

07 17 29 40 CC Good morning! How are you this bright, sunny morning?

07 17 29 59 CC Apollo 9, Houston.

07 17 30 06 CMF Houston, Apollo 9.

07 17 30 06 CC Oh! Good morning. Even though it is dark outside, it must be time to get up.

07 17 30 14 CMF Oh, I guess it must be. You're calling.

07 17 30 17 CC Oh, yes.

07 17 30 18 CMF Houston, how do you read me?

07 17 30 19 CC I read you loud and clear.

07 17 30 22 CMF Okay.

07 17 30 25 CC Now we let you grab an extra hour, but we figured if we let you sleep too long here, you would oversleep on the morning.

07 17 30 36 CDR Oh, we'll try not to do that.

07 17 30 38 CC Okay. I didn't figure you would.

07 17 30 51 CC We've got you zigging across Mercury, here. I'll have you for about the next 7 minutes.

07 17 30 57 CMF Alrighty. What would you like to start out.

07 17 31 02 CC Well, I have block data or the accumulated update, which is the earliest?

07 17 31 05 CMF Well, let me find the book and find out.
07 17 34 42  CMP  Houston, Apollo 9. Why don't we start with the consumables? Those are only two digits apiece.

07 17 31 49  CC  Okay. You're coming through a little weak there, Dave. How are you reading me?

07 17 34 38  CMP  Your part's clear. How are we now?


07 17 33 23  CMP  Well, I reckon. Stand by one.

07 17 33 26  CC  Okay.

07 17 33 45  CMP  Okay, sir. I've got the appropriate squares. Go ahead and fill them.

07 17 33 48  CC  Okay. Reading block data number 19: 119 1 Bravo, plus 262, minus 0640 187 03 40 3513; 120 1 Bravo, plus 318, minus 0630 188 42 36 3106; 121 1 Bravo, plus 336, minus 0663 190 25 26 3009; 122 1 Alfa, plus 303, minus 0660 192 07 02 3445; 123 1 Alfa, plus 312, minus 1632 194 43 40 3198; 124 1 Bravo, plus 336, minus 1630 196 25 35 2993; 125 4 Alfa, plus 312, minus 1632 196 07 06 3221; 126 1 Bravo, plus 336, minus 1490 199 25 49 2998. Pitch and yaw trim: minus 0.04, minus 0.04. We've got about 60 seconds. Read them back as fast as you can.

07 17 37 24  CMP  Roger. I missed the second batch. You broke up.

07 17 37 27  CC  The second block, you say?

07 17 37 31  CMP  That's affirm.

07 17 37 32  CC  Okay. Reading second block: 120 1 Bravo, plus 318, minus 0640 188 42 36 3106. And we'd better take your readback over muffine at 5%. We'd like to turn off the fan on inverter 2, and turn off inverter 3.

07 17 38 08  CMP  Okay. We'll clean up to suit you. That was the longitude in the first block.
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07 13 03 39 CMP ** - - Okay.
07 13 03 40 CC We'll do a P52 to NOMINAL, and your T-align is 190 30 00.
07 16 03 39 CMP Okay. 188 25. P52 to NOMINAL, 190 30 00.
07 18 04 00 CC Okay. At 189 34, we'll have some S065 photos.
07 18 04 19 CMP Okay. And we'll have your update and so forth later on. And then at 191 25, we want to do a P52 realign to NOMINAL and your T-align of that is 192 70 00.
07 18 04 37 CMP 191 25, P52, realign to NOMINAL at 192 70 00.
07 18 04 44 CC Okay. And now the next question is - You know, they're wanting to photograph waste water dump from the ground, and one of the windows we have is right around 192. But that's also during an S065 photography, and we'd just like to have your comment on this. If you have any doubts about it, we don't want to do the waste water dump.
07 18 05 24 CDH Yes. Stu, I don't think we can do that and still take pictures. It's not going to interfere; we have enough guys to do it, but ... roll of picture
07 18 05 40 CC Roger. Jim, you get ... Jim, you got a lot of static in the background. Yes, that was my opinion too. Let's just forget the waste water dump; we'll catch that some other time.
07 18 05 54 CDH Okay. We'll see if we can get it in some nonconflicting period.
07 18 05 58 CC Roger. And we've got about 3 minutes here. We're going to have pretty bad CNR. Let me finish these updates when we pick you up at the Canaries, about in 3 minutes ...

CANYAR (REV 118)

07 18 10 05 CC Okay. Apollo 9, Houston. How do you read met.
07 18 10 06 CMP Five-bye.
07 18 10 09 CC Okay. We've got nice good CNR again, now. Okay, you ready to continue with some updates?
On, very well. We're ready. Go.

Okay. At 192 00, we will uplink you the desired orientation, and at 192 55 we'd like to have an alignment to that preferred option.

Okay. Understand. At 192 00 you'll give us an uplink with the desired, and we'll align to it at 192 55.

Okay. And the reason behind all that is, at 193 00 we'd like to do an S-band high-gain antenna test.

How about that. Okay. At 193 00 we'll try out that big antenna.

Okay. And at 193 35 we'll also have an S-band high-gain antenna test.

Okay. 193 35, S-band.

Okay. 194 27, a P52, NOMINAL option 2-align. 195 plus 00 plus 00.

Roger. 194 27, P52 NOMINAL, 195 00 00.

Okay. And at 195 plus 10, we'll have some I22 landmark tracking. And we can kick this around now or later. We're getting all the details, but basically we're going to disable the I21 alarm so you will not get it. We do have them trying to drum us up some body rates that correspond to that six-tenths body rate that Driss asked for the other day, which we have seemed to find yet. Also, we're having them look into what the program will do with it if we do Mark, even though you don't get the alarm. But we can cover it with that later.

Okay. Very good. Thank you. 195 10 for I22.

Roger. And at 197 00, we'll power down the spacecraft.

Okay. Power down at 197 00.

Okay. At 197 10, we'd like to get a radiation survey through your pass across the Atlantic at that time. And I've got a couple of procedures on that meter that get stuck down on the lab signal conditioning panel somewhere. I guess I'll let that same one you all took into the lab that we saw on TV.
07 18 13 10 CDR Roger. It is.

07 18 13 12 CC Okay. Let we'd like to have at this time would be to place the range switch to 0 to 0.1 REV's per hour, and place the subh switch to OFF and obtain the peak dose rate and time of occurrence between GET of 197 plus 23 and 197 plus 33 from one of the couch positions.

07 18 13 45 CXP Okay. Understand. Set the range to 0 to 0.1, the subh OFF, obtain peak dose and time during the period 07:23 to 197:23.

07 18 14 01 CC That's affirmative. That's all our updates at this time. We would like to get a report from you of your SOCC frames remaining, the 70mm and 16mm film remaining, and anything about the targets of opportunity you photographed yesterday that you feel you haven't told us.

07 18 14 23 CXP Okay. Stand by.

07 18 14 32 CC And I'd like to have your E-band volume up at this time. We'll be going over to Madrid in about a minute.

07 18 14 36 LMP Okay.

07 18 14 40 LMP We'll give you the photo stuff in a little bit. We're coming over the top of apogee here, and we wanted to see if we could get some pictures.

07 18 14 41 CC Real good. I'll show you just about making landfall. I'll stop talking to you. About the only thing else we'd like to get from you would be a crew status report at your convenience; we can do it as you come back around.

07 18 15 00 LMP Okay. Very well.

07 18 15 01 CC Anc, joint V, Houston. Thirty seconds LOS Madrid; Cararvon at 45.

07 18 15 36 (CF) Roger. Cararvon at 45.
Apollo 9, Houston through Carnarvon. Standing by.

Roger. You're five-square. Good morning.

Good morning, Rusty.

It's a beautiful day over Africa. How is it in Houston?

Well, I don't know. It's still dark out, at least it was when I came in. It's a little chilly. We've been having some cold weather.

Boy, I'm glad we chose this time of year to take our vacation!

Yes, you're missing - you're missing all the cold weather here. It'll be nice and balmy when you get back. This should end - the leaves are budding out, you know; of course, it's springtime, but it's cold.

We can take a crew status report any time you'd like to give it to us.

Houston, this is the CNM, here. I only got 7 hours sleep last night; I took one Actified.

Roger. I copy that.

... half and one Actified.

Say your hours of sleep again, Rusty.

Yes. That's 6-1/2.

Okay.

By the way, just out of curiosity, can you tell any difference in the quality of the voice between Dave and T or Jim and I?

You're coming through real good. Let's have Jim say something else, here.

Roger, Houston. 1, 2, 3, 4, 5, or something else.
Okay. That's not quite as clear as Rusty's transmission.
CARMARVON (REV 118)

07 18 48 32 CC I believe it sounded like I was wanted to say something, and I couldn't hear it at all.

07 18 48 37 CDR Oh, okay. How about mine now?

07 18 48 40 CC Yours isn't quite as clear. It's a little mushy, but on the three, Dusty's is the best.

07 18 48 47 LMP Okay. This is Dusty. I'm wearing a bunny hat, and the other two are wearing lightwights. We were just kind of curious.

07 18 48 55 CC Oh, well. It looks like we got a data point. Hey, Jim, for you - for your info, the weather looks - shaping up real well for Thursday morning. Looks like it's going to be pretty good.

07 18 49 08 CDR Oh, that's fine and dandy! Hu, you do good work.

07 18 49 14 CC Well, can't say anything yet. I mean, when I say pretty good, that was compared to what I what I gave you yesterday. Officially, we're forecasting 2000 feet, scattered, variable, broken, 10 miles vis, winds 300 degrees at 15 knots, the seas about 4 to 5 feet with a few higher swells.

07 18 49 39 CDR Well, keep working on it. That's not good to my specifications yet.

07 18 49 41 CC Yes, sir; that's in work, and could we get a CMP sleep report?

07 18 49 44 CMP Roger. I need about 6-1/2 hours and had no pills.

07 18 49 52 CC Roger. Copy.

07 18 49 53 CMP Oh, listen; one other thing we should throw in there: we each had a vitamin pill yesterday.

07 18 50 07 CC Okay. Very good. The vitamin; staying healthy.

07 18 50 13 CMP And, Houston, we've taken 15 frames of S/C so far.

07 18 50 20 CC Very good. Thank you.
And, at your convenience, we'd like to know how much 70mm and 16mm film you've got.

Roger. On the 70 millimeter, we've got roughly 200 frames left.

Very good.

And, Dave, a question just personal - on curiosity here: I was wondering if anybody had tried the 7-meter looking at the ground targets and so forth - how they showed up in that.

No, we haven't tried it yet, but we're going to probably get around to it, here, one of these days. That's a good idea.

And, Apollo 9. Just another thing while we've got a minute to chat about - on curiosity. I noticed the cabin temp running down 66, 69, and so forth. Do you not feel cool at that, when you're sleeping, or do you sleep pretty warm?

Gee, as a matter of fact that's a little warm around 70. I think that's our general feeling.

Stu, with the cabin fan not running, that's really the temperature of the cabin sensor, only. It's a little hard to tell exactly what the temperature of the cabin is, but if we turn the cabin fan on, we noticed the other day, that it jumps a few degrees. So I guess that the cabin fan - I mean the temperature sensor is located in a spot that's a little hotter than the main cabin.

Oh, very good. Thank you.

Guess if you wanted a fairly honest reading, we could turn the cabin fan on for a second and let it get up there and turn it back off again.

No. No, that's no problem. I was just thinking of you sleeping with that temperature. I was just curious whether you thought it was cold or not.

It kinda depends on where the hose outlets are, whether you're cold or warm during the night.

Roger.
(GOSS NET 1)

07 18 53 04  CC  And, if you would, bring up your S-band volume, please.

HONEYSUCKLE (REV A18)

07 18 53 26  CC  Okay. Apollo 9, Houston. I've got you through Honeysuckle. Did I get your S-band volume up?

07 18 53 25  CMP  Sure is.

07 18 53 26  CC  Oh, very good.

07 18 53 55  CC  And Apollo 9, Houston. We're recommending that Charlie roll be ENABLED and Delta roll DISABLED.

07 18 54 03  CMP  Roger. Charlie ENABLED and Delta DISABLED on the roll.

07 18 54 24  CC  And, dusty, Houston. At your convenience, you might push on your PICKED sensors; we're getting a little erratic data.

07 18 54 34  LMP  Any particular one?

07 18 54 36  CC  Roger. Your chest – you're getting the EKG's jumping all over.

07 18 55 12  LMP  Now about now? Do they settle down any?

07 18 55 15  CC  No, it's – it's not, it's really going wild. Must either be – if it's not moved it must be a bad sensor.

07 18 55 26  LMP  Either that, or my heart.

07 18 55 26  CC  Man, I hope not.

07 18 55 32  LMP  No, I have an idea that the electro tape is dried out. It – the ground feels a little bit scratchy right now.

07 18 55 40  CC  Okay. Copy. And you'll impress me with your wealth of knowledge coming up with statements like that.

07 18 55 53  LMP  It's afraid Mr. Scott uses all the electronics up.

07 18 56 58  CC  I see.
And, Apollo 9, Houston. Just another curious question, if you've got the time. When you dump the waste water, does it hang around the spacecraft for a long time, or do you - does it - Can you see the particles, or do they dissipate pretty easily?

You can see them all right, especially at sunset and sunrise. They really shoot out of there with pretty high velocity, and it's kind of interesting behavior. Most of them disappear over the hill rapidly, but it looks as though it continues to sputter and spurt out of the duct there for quite a while, after you've completed the dump. I'm not sure how long it continues that way, but for quite a while. When you're watching the particles go away, strangely enough, it looks like some of them either collide or something. We haven't figured out what, yet, but occasionally one of them will come back past us for a little while.

Good grief! Have you got some pictures of those?

Yes.

Good. We're going to have an early LOS here at Honeysuckle, and we'll see you Mercury C5.

Roger.

And, Apollo 9, this is Houston through the Mercury. And I want to volunteer a map update here before my friendly CDP zaps me.

Okay. Stand by. I'll get something to copy it.

Okay.

Okay. Go ahead.

Roger. It's REV 118, which you're on now; time, 187 24 55; longitude, 108 degrees west.

Okay. 187 24 55, 108 west.

That's affirmative.
And I copy your star angle difference and your torquing angles, there, Apollo 9.

Roger. And I'll run a quick sextant realignment on REFCLIP to see what kind of accuracy we got out of this.

I missed that, Dave. Say again.

I say I'll be down and run a sextant realignment now on REFCLIP to see what kind of accuracy we got out of the RAS.

Oh, very good. And I take it the telescope worked okay yesterday. Did it hang up at all with you?

No, yesterday was a clean day. Wasn't one glitch all day.

Did you do anything, or did it just go away?

No, apparently it just worked itself out. Perhaps there was something on the outside from the LM thrusters or something, but it seems to have worked itself out.

Very good.

Apollo 9, Houston. Forty seconds LOS Mercury; see you Texas, 30.

Okay.

Apollo 9, Houston. Standing by.

Roger. Apollo 9.

Houston, Apollo 9 ...

Love, the CCWS here is real bad. Let's hold off for about 2 minutes. I couldn't copy.

Understand that we will not torque the angles ...

Okay.
07 19 32 39  CC  And, Apollo, Houston. We have a state vector for you, if you would give us POO in ACCEPT, please.

07 19 32 46  CMP  You have POO in ACCEPT.

07 19 32 48  CC  Understand.

07 19 33 13  CC  Apollo 9, Houston. We'd like to turn the fan on in H, tank 1 at this time, please.

07 19 35 04  CC  And, Apollo 9, Houston. How do you read now?

07 19 35 20  CMP  You're coming in five-square, Houston.

07 19 35 25  CC  Okay, Apollo 9. VERB 66 has been entered. The computer is yours, and I have a NAV check to go along with that vector.

07 19 35 35  CMP  Okay. Stand by.

07 19 35 49  CMP  Okay. Go check.

07 19 35 50  CC  Roger. Reading NAV check: 188 30 00, minus 3329, plus 13537 2294.

07 19 36 17  CMP  Okay. Understand. 188 30 00, minus 3329, plus 13537 2294.

07 19 36 27  CC  Roger. Readback is correct, and it looks like we ought to have an answer here shortly.

07 19 36 32  CMP  Here's your answer.

07 19 36 40  CMP  And, Houston, 9. Let me give you some of this data from the COAS. I think you might find it interesting.

07 19 36 48  CC  Roger. I'm ready to copy. I can read you okay now, Dave.

07 19 36 52  CMP  Okay. I'll just give you the CHT and the gyro torquing angles and tell you what instrument we used. Okay?

07 19 37 00  CC  All right.

07 19 37 01  CMP  Okay. The first one's the COAS, and I used the calibration that I found during the rendezvous, 5 days ago. The COAS has been in and out about, I guess, four or five times since then.
The star angle - The GFR was 187 14 30. The gyro torquing angles were minus 00059, minus 00013, and plus 00183.

07 19 37 34 CC
Hey, that sounds beautiful, Dave. That's really good.

07 19 37 37 CEP
... the star-angle difference on that was 0.03.

07 19 37 43 CEP
And on the sextant, which was the next torquing we did, the GFR was 187 19 00, and the torquing angles were plus 00073, plus 00060, minus 00034. The star-angle difference on that was 0.01.

07 19 38 17 CC
Roger, Dave. I copy all those. Hey, that COAS bombed through there, didn't it?

07 19 38 24 CEP
Yes, then I had another ... to see what the GFR's were all the way down, so I have another sextant for you: 187 21 00. The gyro torquing angles were plus 4 balls 1, minus 5 balls 79, and plus 4 balls 19; which sort of says the sextant's pretty good, which we already know. The star-angle difference on that was 0.01.

07 19 39 01 CC

07 19 39 06 LMP
Okay. Then not to neglect our friendly telescope, the sun was coming up but I tried to get a telescope alignment. Also, but I think we sort of lost out a little bit because my second star was Menkent, and it was pretty dim. I had a tough time seeing it, so we did not torque the platform, but I'll give you the data anyway. The time was 187 31 30. Gyro torquing angles were minus 0076, plus 00169, minus 00133. The star-angle difference was 0.05, and I think that's because I just couldn't see Menkent when we got daylight through that telescope.

07 19 39 55 CC
Okay. Very good.

07 19 39 55 LMP
Anyway, I think it shows there is a certain capability with that COAS.

07 19 40 03 CC
Yes, it sure does. ... That looks pretty good.

07 19 40 14 CC
Okay. And I have a couple of targets for you coming across Africa this time, if you're in a picture-taking mood.
I'll,..1e...¢? (_)ss li_i' 1) Tape 120

All right. Are you ready to copy?

Okay. Go ahead.

All right. The target is in Chad. It's the northeast slope of the Tibetsi Mountains. Your time for the first frame: 187 57 03. We would like to have seven pictures, at 10-second intervals, and straight down the nadir. Next target: Red Sea, 160 03 06, seven pictures, 10-second intervals, and right on the nadir again.

Okay. Copy the first one. 187 57 03, seven frames, 10-second intervals, on the nadir; and 160 03 06, seven frames, 10-second intervals, on the nadir again.

That's affirmative, Apollo 9.

Okay.

Houston, we have a little discrepancy on our map there. According to the map update this REV does not take us over Chad. We cross north of it in Libya. I wonder if it's right?

Roger. I copy. Apollo 9, the map might be off just a little bit here due to orbital parameter. Let me get the details on that.

Rusty, I'm looking at the map here also, and I agree with you. I think we must have something wrong on our first update.

Okay. It looks like we may get the Red Sea one in there, just the southern end of the Red Sea.

Roger. I see that.

Well, Rusty, we're working that out. I'll have to take a gotcha because I didn't check that against the map before I passed it to you.

You think that first one was a bai one?

Yes, I think it was, and I did not check it on my map before I sent it up to you, so you've got me.
07 19 45 19 LMP  Didn't mean to do that, but I did want to get it straight.

CANARY (REV 119)

07 19 45 22 CC Roger.

MADRID (REV 119)

07 19 49 36 CC Apollo 9, Houston.
07 19 49 40 CDR Go ahead. Houston, Apollo 9.
07 19 49 42 CC Okay, Jim. I've run that first target out on the map here, and I would believe 30 degrees south of the nadir which is the information that we have now. I don't know the Tibet Mountains by first name, and they're not listed; but there is that mountain range right there where you'll be at that time. So the time and the frame stay the same. Shoot it 30 degrees south of the nadir.

07 19 50 09 CDR Okay; fine. And be advised we have about two and one-third rolls of 16mm outdoor film still left. We want to save one roll for re-entry.
07 19 50 22 CC Roger. Copy. Two and one-third rolls 16mm and saving one.
07 19 51 03 CC Jim, these targets of opportunity - I'm planning on just passing them to you at convenient times until you holler Uncle, so if we start giving you too much just say so.
07 19 51 16 CDR Okay. We're picking up the ones we can get to easiest and it's sort of a random process.
07 19 51 23 CC Roger. Understand.
07 19 51 30 CC And, Apollo 9, Houston. I was guilty of slighting someone on my flight plan update; under the comments, it was good-morning from your smiling flight planners.
07 19 52 03 CDR Say that one again, Houston; we just missed it.
07 19 52 06 CC Roger. We'll see you over Canaveral about 20. We're going to close you here at Honey suckle -- I mean at Vadar within a minute.
Okay, Houston. We want to report on another failure. Last night the exerciser failed.

Roger. Understand the exerciser failed. Who do we give credit for being so strong they busted it?

Rusty broke it.

Okay.
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CARNARVON (REV 119)

07 20 23 01  CC  Apollo 9, Houston, through CARNARVON. Standing by.

07 20 23 06  LMP  hello, Houston, this is Apollo 9. We hear you loud and clear.

07 20 23 16  CC  Roger. You're coming in real good. And the SO65 or takeaway over Africa has been cancelled due to weather. The one on the next revcoming up will still hold, however.

07 20 23 26  LMP  Okay; very good. Yes, Africa has a lot of clouds over it these days ... that series of photos along the end of the Red Sea. They show up pretty.

-- -- -- --  CC  Roger. Copy.

-- -- -- --  CDR  And we did not get the ones along those mountains.

-- -- -- --  CC  Okay. Thank you.

07 20 26 39  CC  Apollo 9, Houston.

07 20 26 33  CDR  Go ahead.

07 20 26 34  CC  Roger. We'd like to turn the fans off in H_2 tank 1. We're going to let the pressure drop down during the day. Be looking at it around 190, we hope.

07 20 26 45  CDR  Oh. Very good. Fans are off in tank 1.

07 20 26 53  CC  And, Rusty, when you get a chance, we'd like to have you check your BIC3B leads going into your blue signal conditioner.

07 20 27 04  LMP  Okay. I'll give that a check right now. Would you say it again? The blue what, please?

07 20 27 09  CC  The blue signal conditi - Hey, I couldn't say it the second time, either. I gave up.

07 20 27 15  LMP  Okay. I want to ask you again.

07 20 27 17  CC  That little blue box down there.

07 20 27 19  LMP  Roger!
Houston, I think that the blue leads are all right. Did you – Were you reading me okay last night just before we all sacked out?

That's affirmative, Rusty.

Okay. I think it's just the sensors.

Okay. We're getting short bursts of good data and then long periods of erratic data.

Hi, Apollo 9, we'd like to have your S-band volume up. We'll be going over to Honeysuckle in about 20 seconds.

Okay.

HONEYuckle (HPY 119)

Apollo 9, Houston with a couple of targets of opportunity.

Stand by one.

Roper.

Okay. Go ahead.

The first one is Cape Kennedy: time 189 plus 10 plus 23; shoot three frames, 12-second exposures; should be right on the nadir. Next target: Bermuda, 189 plus 14 plus 07; three frames, 12-second intervals; and that's going to be real close to the nadir. Might be about a mile off.


That's affirmative, Apollo 9.

Houston:

Go ahead, Apollo 9. Houston here.

How's the cloud cover down there today around Texas?
07 20 34 57  CC  I haven't been out since it's been daylight, Rusty; let me check here. I understand there's broken cloud in our area.

07 20 35 15  LMP  Okay.

07 20 35 35  CC  And we'll see you Mercury 16.

07 20 40 00  LMP  Roger.

MERCURY (REV 119)

07 20 41 39  CC  Apollo 9, Houston through the Mercury. Standing by.

07 20 41 52  LMP  Roger

07 20 41 53  CMP  -- Roger, Houston, this is Apollo 9. Got some gyro torqueing angles, if you want them.

07 20 41 57  CC  I am ready to copy.

07 20 42 00  CMP  Okay. CTL of 186 29 00, plus 00827, plus 30098, plus 01792.

07 20 42 18  CC  Roger. Would you read me the third one again please, Dave?

07 20 42 22  CMP  Roger. Plus 01792. And that was to a nominal alignment. We course-aligned, and that's why you got the big number there.

07 20 42 32  CC  Okay. I just wanted to make sure I was getting it right. Thank you.

07 20 42 37  CMP  Okay.

07 20 50 11  CC  Apollo 9, Houston. One minute LOS Mercury; Redstone 57.

07 20 50 19  CMP  Roger.

07 20 50 22  CMP  Roger, Houston.

REDSTONE (REV 120)

07 20 58 58  CC  Apollo 9, Houston through Redstone. You have a GO for 130 dash 1.
07 20 59 04 CMP Roger on the GO.
07 21 01 24 CC And, Apollo 9, Houston. Do you read?
07 21 01 31 CMP Roger. Go ahead.
07 21 01 31 CC Roger. We've got you now for a nice long pass.
We'll have you until 28 or so, and I've got an S66 update at your convenience.
07 21 01 05 CC ... Copy ...
07 21 02 16 LMP Houston, ready to copy your S66.
07 21 02 18 CC Roger, Apollo 9. Stand by one.
07 21 02 32 CC Okay. Apollo 9, Houston. S66 update. Inertial engines: 1800 22610 0 190 37 44 190 29 04; ORB RATE. The first one is Austin: 190 40 42 10 03; and the weather over Austin has broken clouds, but we want the pictures taken anyway. The next area is Charleston: 190 47 10 05 03; your ORB RATE ball, 180 327.5 0 0; ORB RATE 9.046, and your ORB RATE data - your WXYZ is the same as you used yesterday. I can repeat it, if you wish; or, if you have it copied, you can use that.
07 21 04 25 CC Apollo 9, Houston. Do you read?
07 21 04 27 SC ...
07 21 04 37 CC Hello, Apollo 9. How do you read Houston?
07 21 05 11 CC Apollo 9, Houston. Do I have you now?
07 21 05 42 CC Apollo 9, Houston. Do you read?

MNA (WRY 140)

07 21 07 15 CC Apollo 9, Houston through Kiln. How do you read?
07 21 07 20 LMP Five-square, now.
07 21 07 22 CC Roger. Evidently we didn't make it at the last site. Did you get my update?
07 21 07 27 LNP The last word that I got was Charleston.
07 21 07 30  CC  Okay. Charleston is your second sight: 190 47 10 08 03. Your ORB RATE angles:  150 327.5 0; ORB RATE: 0.066.

07 21 06 02  LMP  Roger. Do we have Victor through Zero ro?

07 21 03 06  CC  Roger. I have those. They are the same as yesterday. Would you like me to read them?

07 21 08 12  LMP  Negative. We have them.

07 21 03 15  CC  Okay. And one other comment: as you come over on the U.S., we'd like to get some 102mm photos, northward across the U.S., out of number five window.

07 21 08 30  LMP  Roger.

07 21 06 39  CDR  We're coming across backwards and upside down, Houston.

07 21 08 44  CC  Roger. This was in connection with the 5665 PAD.

07 21 08 52  CDR  Sorry!

07 21 08 55  CC  But you know, I don't really think that's a requirement. If you just take us some good old pictures looking northward, there, that'll be all right.

07 21 09 06  CDR  Okay. Will you take him some good old pictures looking northward?

07 21 09 21  CC  But as you will notice on the map, this REV 121, you get up there quite a ways. That's really the pass we want them on.

07 21 09 29  CMP  Okay. Could you tell me what time we might get over Corpus Christi? On this pass?

07 21 09 36  CC  You should be past it. You are not too far off the west coast of Florida.

07 21 09 42  CMP  Oh yes. I can see Cape Sandblast right now. I wanted to say hello to my friends down in Refugio, but it looks like I missed them.
Apollo 9, Houston.
Roger. Go ahead.
Roger. Why don't you all think a little bit today, how much in the flight plan tomorrow afternoon you would like to get squared away for reentry. We will be getting you up right on time the next two days, but we thought if you wanted, tomorrow you might want a few hours.
Yes, we have some moving around to do and we would like to be in a pretty posture for reentry when we get up on reentry morning.
Why don't you kick it around a little bit, and maybe just give us an estimate in hours that you'd like extra for tomorrow afternoon. We'll make allowance in the photo plan, and so forth.
Alrighty.
And, Houston, do we have enough time for the readback on the SC65?
That's affirmative.
Okay. 18000 29610 all zips 190 3744 1903000 ORB RATE 0.066; local vertical angles, 180, 337.5, and 0. Austin: 190 42 44 10 03, weather broken but take them anyway; Charleston: 190 47 10 08 03.
That is affirmative; and your data that you load, your WXYZ, is the same as yesterday.
Okay.
Apollo 9, Houston. One minute LOS; Tananarive at 42.
Hello there, young man.
Good morning.
How are you today?
Well, I'll tell you. It looks like I'm going to have to get a flight to get any sleep.

Av, come on now! Stop picking on us!

Okay, not really. Any excuse to get a flight though.

Roger.
CARNARVON (REV 120)

07 21 56 53 CC Apollo 9, Houston through Carnarvon. I have one Hesselblad target of opportunity.

07 21 57 05 CC Go ahead, Houston. This is Apollo 9.

07 21 57 38 CMR Roger. Your target will be Cape Blanc: oceanography, 191 plus 30 plus 33, five frames, 25-second interval, and it's north 5 degrees. Over.

07 21 57 40 CC Roger. The time is 191 00 30, Cape Blanc, oceanography, five frames, 25-second intervals, 5 degrees north.

07 21 58 39 CC Roger. And, Apollo 9, Houston. We've been noticing that you've been averaging about 20 pounds of RCS per day, for the 3060 landmark and photos what have you. You still have about 70 pounds above the SCS, RCS redline, and what we're saying is that you can just about double your average usage and still be in good shape, if you want to do some particular tracking on something.

07 21 58 27 CMR Okay. Very good. We've actually been throwing in a little particular tracking now and then too. I think the fuel usage that we've been having is probably all that we need. Thank you.

07 21 58 05 CC Okay. Very well.

07 22 05 02 CL Apollo 9, Houston. We are coming up on Honeysuckle; S-band volume up in about 30 seconds.

07 22 05 11 CMR Roger. Roger.

MERCURY (REV 120)

07 22 24 01 CC Apollo 9, Houston. About 45 seconds L.O.S. Redstone at 30.

07 22 24 44 CMF All right.
Apollo 9, Houston through Redstone. Standing by. A big long pass this time.

Okay, Houston, Apollo 9.

Hey, Houston, what's the forecasted weather condition on the east coast?

Roger. Let me get you a good one for today there.

Okay. And in particular, I'm interested in whether we are going to get a good shot just north of Charleston there.

Roger. From the indications we have down here, it's looking pretty good, and it ought to be open up that way.

Real great weather.

Roger.

Okay. Three pictures of clouds over Austin.

Apollo 9, Houston. I have a 16mm update.

Okay. Stand by one. I'll get ready to copy.

Roger. Standing by.

Roger. Target will be Africa, Gulf of Guinea to Madagascar. 16mm, 75mm lens, six frames per second, C3X 363 film, start time 191 plus 03 plus 54, shoot south 30 degrees for 14 minutes.

Okay. Gulf of Guinea to Madagascar, 16mm, 75mm lens, six frames per second, C3X 363 film, start time 191 plus 03 plus 54, shoot south 30 degrees for 14 minutes.
Roger. Next one, target will be Gulf Stream: same camera, same film, start at 192 plus 22 plus 30, shoot on track for 3 minutes.

Okay. Gulf Stream: 192 22 00 on track 3 minutes.

Okay. On one roll of that CEX 366 we'd like some interior photos. Use a spot meter at ASA 200, shutter speed 1/60. Use entire roll and mark the magazine for correct processing.

Houston, we don't have enough film to do that. We still have some interior film. We only have two full rolls of exterior, and we want to save one for reentry, so we only have one to play with and it looks like it will take it for the Gulf of Guinea and Africa and the Gulf Stream.

Oh, understand. I thought you had more than two.

No. There's two.

Okay. We're with you.

And, Apollo 9, I have some numbers where you can start looking for a fuel manifold pressure decay, to push the secondaries in your RCS.

Okay. Go ahead.

Roger. Alfa through Delta will be 48, 52, 41, and 18.

Okay. Understand, Houston. The onboard gage readout, is that correct?

That's affirmative. They'll be onboard gage readings - we will update them as we go along here a little bit more, but that's where you can start looking for a fuel manifold pressure decay to switch.

Okay. You want us to switch them 170?

Apollo 9, Houston. I missed your last comment; say it again.

Roger. You want us to go ahead and bring on the secondaries in 170 psi?
07 22 56 17  CC  That's affirmative. 170 psi.
07 22 56 21  LMP  Okay.
07 22 56 37  CC  9, Houston. With your earlier comment on fuel usage, we're predicting that you probably won't get to those crossover points today.
07 22 56 46  LMP  Okay. Understand. Probably won't reach them today, but we'll keep them in mind.
07 23 02 47  CC  Apollo 9, Houston. About 1 minute LOS. Like to verify the attitude set switches in GDC.
07 23 02 56  LMP  Negative. The attitude set is at RAMU.
07 23 03 03  CC  Roger. Request GDC unless you have a real reason to put it in RAMU.
07 23 03 10  LMP  No. That's just where it ended up the last time I did a GDC set.
07 23 03 15  CC  Roger.
07 23 03 29  CC  9, Houston. In preparation to firing up the S-band, like to do the IMC checklist, page 214, the first six steps of the WIRECON system powerup.
07 23 03 47  LMP  Okay. Understand. The first six steps on 214 IMC checklist.
07 23 03 52  CC  Roger.
END OF TAPE
CARNARVON (RN 121)

07 23 33 10 CC Apollo 9, Houston through Carnarvon. I have an S065 update.

07 23 33 16 CDR Okay, Houston. Stand by one.

07 23 33 44 CC Houston. While you are digging things out, you might as well update your procedures book, and I can update your high-gain antenna test.

07 23 33 54 CDR Okay? Why don't you give us the S065 first?

07 23 33 57 CC Roger. You ready?

07 23 34 00 CDR Roger. Go.

07 23 34 00 CC 16000 289°90, you in all eyes 130 09 33 102 00 00, ORR RAWR. First sight Colorado River: 192 18 33 10 08. Second sight, Snyder, Texas: 192 18 02 00 03. Third sight, Cumberland Plateau: 192 18 11 08 and 03. Over.

07 23 35 31 CDR Roger. 16000 289°90, all eyes 130 09 33 102 00 00. Orbit rate, Colorado River: 192 18 33 10 08. And somewhere in Texas: 192 18 02 00 03. Cumberland Plateau: 192 21 11 08 03.

07 23 36 16 CC Roger. Readback correct. That's Snyder, Texas. And your Victor through Zulu numbers will be the same as before.

07 23 36 27 CDR Okay --

07 23 36 29 CDR -- Okay. What do you have on the high gain S-band antenna?

07 23 36 35 CC Okay. Why don't we just copy these things down, if you have got a pad there to copy; and then I'll go into the procedures and change the procedure itself.

07 23 36 46 CDP Okay. Stand by. Let me just get a pad.

07 23 36 50 CC And while you are doing that, we are going to be kind of close there between the end of the S065 and the first Carnarvon pass. And, also, you have got a P6 realignment in there; so if we miss that Carnarvon pass, we'll catch it over Hawaii.
07 23 37 14  CDR  Yes. We can get that. No problem.
07 23 37 16  CC  Okay. Good.
07 23 37 19  CMP  Okay. Go ahead with the PAD, Ron.
07 23 37 21  CC  Okay. The platform is aligned out of plane to
the north; voice COMM will be VHF. Okay. Change
high-gain antenna test procedures as follows:
--
07 23 37 49  CC  -- Now, will you give us the PAD first, or notes,
Ron?
07 23 37 52  CC  I'll give you notes first.
07 23 37 56  CMP  Okay. Stand by. I got the PAD first. Hold on.
07 23 37 58  CC  Oh, I'm sorry.
07 23 38 11  CMP  Okay. I've got the procedures book here, now,
with our procedure in it. Will your notes follow
the procedures so I can work directly on it?
07 23 38 21  CC  Okay. Let's go into that part first, and then
I'll give you some additional notes.
07 23 38 26  CMP  Okay.
07 23 38 31  CC  Okay. In the procedures book, you go on down
to step 7, and your antenna angles are pitch, minus
45 degrees; yaw is plus 90 degrees.
07 23 39 02  CMP  Okay. Go ahead.
07 23 39 03  CC  Okay. Delete step 5, perform step 7 at 193 plus 06
plus 05, and add high-gain antenna track to reacquire.
07 23 39 36  CDR  As part of step 9, Ron:
07 23 39 39  CC  Affirmative. At the end of step 9 there.
07 23 39 49  CC  Do step 10 at acquisition which will be at 08 plus
05. Delete step 12.
07 23 40 31  CMP  Any more than that, Ron?
07 23 40 33  CC  Affirmative. While I think about it, 3-band volume
up at N2 for Honeysuckle.
07 23 40 41  CC  Okay. On step 13, we'll do that three times. The
first one at Carnarvon LOS, that'll be at 19 plus 40;
at Hawaii LOS, be 35 plus 22; and Hawaii LOS at 51
plus 09. And scratch step 16 or.
Okay. Is that everything on the procedures then?

Okay. That's all of the procedures. I'd like to get you set up in a passive thermal control. And I can give you some numbers for that so that we can in FTC as we are going through this test.

Okay, Houston. We're back with you now. Go ahead with the FTC.

Okay. Establish CMB RATE by using FTC. CMP checks is page 3-17. Okay. Step 2: at 193 plus 06, pitch 358.00 - rather roll is 358.0 - Pitch and yaw are all zeros.

Okay. Do you have any more, or do you want me to read all that back to you?

Negative. I have some more. New step 6 and step 7 of that CMB checklist as follows: VERB 21 ENTER, 3176 ENTER, 4 zips ENTER, 14714 ENTER.

Step 7: VERB 21 ENTER, 3176 ENTER, 23163 ENTER. An that should be it.

Okay, Ron. I got that. For step 6 is only change is a 00002 and 14714, and the number on step 7 is 23163.

That's right.

Okay. On that, I got just a minute. Ron, I've got one more question. On the time you gave us there, shouldn't that time be for step 7?

That's affirmative. Should be on step 7, that time there, 193 plus 06.

Okay. Thank you.

Glad you're checking us.

Okay. On the procedures, on step 7 you've got the pitch of minus 45 and yaw of plus 90; delete step 8; perform step 9 at 141.06 06; and add after the existing step 9, high gain antenna track to REP/CQ: or step 10 that should be done at acquisition.
which should be at 08 05; delete step 12; step 13 we're going to do three time; Carnarvon LOS at 119 40; Hawaii AOS at 235 27, and Hawaii LOS at 44 09. Delete everything beyond step 15 — delete step 15 and beyond. Excuse me.

07 23 46 45 CC Affirmative. Delete step 15 and beyond. The AOS and LOS times I gave you were 193 in minutes.

07 23 46 56 CMP Right. Okay. Understood the platform is going to be out-of-plane to the north, and we're going to use VHF voice for radio.

07 23 47 06 CC Roger. I'll give you Carnarvon LOS, which is 193 19 40. Hawaii AOS is 193 35 22, LOS is 193 44 09.

07 23 47 21 LMP Okay. Understand the Hawaii LOS is at 44 07 instead of 09.

07 23 47 35 CC Affirmative.

07 23 47 46 CMP Okay. We'll look these over, and if we have any questions I'll give you a buzz later.

07 23 47 50 CC Okay. Just also note that on step 13 there, where we take those three times, copy them down after the antenna stops slewing.

07 23 48 00 CMP Understand. Copy down after the antenna stops slewing.

07 23 48 04 CC Roger.

HAWAII (REV 121)

08 00 03 00 CC Apollo 9, Houston.

08 00 03 03 SC Go, Houston.

08 00 03 08 CC Roger. If you haven't guessed it yet, I guess you can see the purpose of this S-band antenna test is - we're testing the automatic STCQ mode of this high-gain antenna during ISQ when the crew may be asleep on the way to the moon. So you can use VHF 04 to monitor, but we don't want you to do any manual slewing to help the rendezvous between Carnarvon and Hawaii.

08 00 03 36 COS Okay. Understand. Do manual operation. Shall we make it authentic by sleeping, too?
Well, no. You've got enough sleep. You can just observe.

Okay.

Apollo 9, Houston, Go.

Okay. Houston, he'll make it authentic, I guarantee you!

Okay.

Want our last gyro torqueing angles?

Roger. Ready to copy.

191 - Stand by. We are getting ready to start this maneuver; I'll give them to you in a minute.

Okay.

Ron, while we are waiting here: be advised I have looked through the flight plan, and I think if we go through tomorrow just as it is scheduled in the flight plan, we will be all right.

Very well. Sounds good, then.

If we knock off at the time that we are supposed to knock off, we will have plenty of time to stow the spacecraft.

Okay, understand.

Okay, here are your gyro torqueing angles, if you are ready.

Ready to copy.

191 26 00, minus 00232, plus 00509, minus 00010.

Roger. We copy that.

Okay.
Houston, this is Apollo 9.  
Apollo 9, Houston. Go.  
Well, I think this is a fairly successful 3065 pass. We had some real nice weather over the clouded areas. And Snyder, O.K., had a deck of clouds that looked like it came right up next to it, and I think that both the geologist and the weatherman will really appreciate these because it shows a solid deck of clouds and a really sharp break, and then the land sticks out from underneath it. So they ought to both get a good - A pretty good piece of it.

Very, very good. My golly.
And, Houston, you got an uplink for us?
Affirmative. Request for an ACCEPT and we have the REFSMAT standing by to send to you.
Okay. You've got P00 in ACCEPT.
Apollo 9, Houston. We'd like you to verify your SPS heater and gaging MAIN A and MAIN B circuit breakers are open.
Negative. SPS system heaters and gaging MAIN A and MAIN B circuit breakers are closed.
Roger. We'd like to open them. We are not going to use ROCS for the deorbit burn.
Alrighty. We'll open them up for you right now.
Roger.
Apollo 9, the computer is yours.
All right. Go back to the BLOCK.
Roger.
That was pretty snappy.
They are still smiling.

How are all you guys down there in that MCCRE holding up? We giving you fatigue yet?

Oh no. We're still in good shape.

Good. I want those recovery guys to find a nice soft piece of water with no wind and no waves tomorrow and lots of sunshine.

We're working on it real good.

Oh yes. I forgot one thing, a couple of helicopters, too.

Okay.

I want you to tell those guys on the Guadalcanal we're looking forward to seeing them.

Okay. You're still thinking about the cake.

Well, that and a few other things.

And that, too.

Roger.

Apollo 9, Houston.

Go ahead, Houston.

Go ahead, Houston.

Roger. I've got some pointing data for you, if you want to take a look at Pegasus.

Houston, 9.

Roger. You there now?

Yes.

Okay. At 192 plus 43 plus 09 with a roll 357.9, pitch 179.9, yaw 363.4, you should see Pegasus passing through your CCAS, and it'll take about 45 seconds. It'll be passing from right to left. You will be trailing it by about 20.0 miles, and you will be 77 miles below it.
06 00 30 22 IMP Okay. What was the roll?
08 00 30 24 CC Roll is 157.8.
08 00 30 30 IMP Okay. At 19845 09 - was that?
08 00 30 34 CC Affirmative.
08 00 30 34 IMP Okay. The angles 357.8, 179.9, 326.4. Pegasus is passing right to left 920 trailing at 77 below.
08 00 30 48 CC Roger.
08 00 31 01 CC 9, Houston. You've got about 150 square feet of area on Pegasus, so you might be able to get a pretty good look at it.
08 00 31 14 IMP Roger. Were those inertial angles or local vertical?
08 00 31 19 CC Roger. Those are inertial angles assuming you haven't torqued the platform on around to the new REFSMRT we gave you.
08 00 31 26 IMP That's a good assumption at this point. And be advised we have taken - We've taken 105 frames of the 8065 now.
08 00 31 36 CC Roger. 105 frames.

ASCENSION (REV 122)

08 00 38 59 CC Apollo 9, Houston through Ascension. Standing by.
08 00 38 03 IMP Roger, Houston ...
08 00 38 31 CC Apollo 9, Houston. I can't read you. You're in a keyhole right now.
08 00 40 42 CC Apollo 9, Houston. We might be able to read you now.
08 00 40 48 CC Say again. Houston, Apollo 9.
08 00 40 50 CC Roger. I missed everything you said there, Jim, we're in a keyhole on the S-band.
08 00 40 54 CC Okay. I said we are going to try to see if we can see it now, and I was wondering how long we could expect to see it in view. For many minutes?
Would you believe 44 seconds to the - just to the COAS part of it at that attitude, so you can see it a little bit longer than that going through the window.

Okay.

9, Houston. We've been looking for some other things with a little more of a trailing angle. Seems like everything we've come across so far is about a 90-degree crossing.

Oh great. We're always out of primes.

Yes.

Apollo 9, Houston. About 30 seconds IOD. Tananari at 53.

Roger. Houston. We saw Farsus going by. We were admiring the distances, and checking the spacecraft were in the proper attitude. At the moment we went through ...

Roger.

END OF TAPE
(GOSS NET 1)  

08 02 00 46  LMP  Roger. We are getting movies of it right now.
08 02 00 51  CC  Okay. Good deal. You're ahead of us. And the other ones are clouded in, we found out, so that's it.
08 02 00 57  LMP  Okay. Fine.
08 02 02 05  CDR  Hey, Ron, are we just going over the recovery sites?
08 02 02 12  CC  Say again. I missed it.
08 02 02 14  CDR  Did we just go over the recovery sites?
08 02 02 19  CC  Stand by one; just a second.
08 02 02 22  CDR  Where's the Guadalcanal? I was just looking down, and I saw a great big ship down there. I just wondered if we happened to pass it.
08 02 02 29  CC  I think you are way south of it.
08 02 02 33  CDR  We're way south of it?
08 02 02 35  CC  Affirmative.
08 02 02 37  CDR  Okay.

ARIA (REV 123)

08 02 07 15  CC  ARIA 5, Houston CAP COMM. Go remote.
08 02 07 23  ARIA  Going remote.
08 02 07 35  ARIA  ARIA 5, remote.
08 02 07 39  CC  Apollo 9, Houston through ARIA for voice checks.
08 02 07 43  CDR  Just a little bit broken, but readable. How ya?
08 02 07 48  CC  Roger. I think you are a little less than readable.
08 02 07 53  CDR  All right. Another one: 1, 2, 3, 4, 5, 6, 7, 8, 9. Apollo 9 out.
08 02 08 00  CC  Roger. It was even better that time, Jim.
08 02 08 04  CDR  Okay. And you are coming through pretty good now, too.
And, Apollo 9, Houston. Another voice check, S-band.

Say again, Houston.

Roger. I just wanted to - ARIA is sending S-band back to us now for voice checks.

Okay.

Loud and clear.

Roger. We're reading you pretty well, too.

Yes. I think they are working a little better nowdays than they used to be.

Hey, I think they come in very handy.

Concur wholeheartedly.

Apollo 9, Houston. Any joy?

Roger, Houston. We got it. He went through the - He went to the diastimeter about a degree and a half low - -

And the same on the COAS. But on the COAS, he was only about a half of a degree low.

Okay. Half a degree low on the COAS.

Right. But now it's in the right window, and it's probably not calibrated very well.

He was a degree and a half in the left window, which should be calibrated pretty good.

Okay. We're a little curious on the times. How did the times work out there?

Looks like he was like - about 10 seconds late.

Okay.

Boy, he's really moving.

Yes. That's just about a 90 degree crossing there.
(GOSS NET 1)

08 02 21 00  CC  Apollo 9, Houston. One minute LOS. Tananarive at 30, and Carnarvon 44.

08 02 21 08  CMP  Roger.

END OF TAPE
APOLLO 9 (GO-TO-GO) VOICE TRANSCRIPTION

(COSS SET 1)

CARNARVON (REV 123)

08 02 44 44 CC Apollo 9, Houston. Standing by.
08 02 44 48 IMP Roger.
08 02 44 51 CC Roger.
08 02 45 57 CC Apollo 9, Houston. We're copying a pretty good
front, middle right, there.
08 02 52 03 CP Roger. We're sort of rosoning on over to correct
attitude for landmark tracking.
08 02 52 08 CC Okay. Good.
08 02 52 10 CP Good eye, though.
08 02 52 13 CC Roger.
08 02 52 16 CDR You keep on us, Ron.
08 02 52 20 CC We'll try that.
08 02 52 24 CP It's going to come a day when we don't see it.
08 02 52 27 CC Okay.
08 02 54 30 CC Apollo 9, Houston. You're on your own. Guam at
about 57.
08 02 54 33 CDR Roger. Guam at 57. We'll keep an eye on it.
08 02 54 46 CP When we come up over Guam, see if we've been into
it or not.
08 02 54 42 CC Okay.

GUAM (REV 123)

08 02 59 41 CC Apollo 9, Houston. We are all smiling again.
08 02 59 46 CDR We fooled you, didn't we?
08 02 59 50 CP I want to know if there was anybody placing any
 bets on . . .
08 02 59 54 CC (Laughter)
08 03 03 02 CC Apollo 9, Houston.
08 03 03 04 CDR Go ahead. Houston, Apollo 9.
08 03 03 06 CC Roger. Pretty smooth about walking that around there. I have one more target of opportunity.
08 03 03 14 CDR Stand by.
08 03 03 19 IMP Okay. Go ahead.
08 03 03 21 CC Okay. At time 195 43 32: it's the Amazon Delta, oceanography, five frames, 10-second intervals; it will be north 35 degrees.
08 03 03 55 IMP Okay. Understand. 195 43 32: Amazon Delta, oceanography, five frames, 10 seconds DELTA-T, north 35 degrees. And be advised, we kind of concluded after unfortunately having made the mistake that the Barbados oceanography shot on the last REV should have been 30 south rather than 30 north, at least from our map here. Unfortunately, we didn't realize that until we had already taken up north.
08 03 04 31 CC Okay. Let me see if you caught us again.
08 03 04 35 IMP Yes. I'm not sure if that's right, Ron. They may have actually wanted the pictures well north of Barbados, but the Barbados were south of us.

HAWAII (REV 123)

08 03 13 06 CC Apollo 9, Houston through Hawaii.
08 03 13 10 CMP Hello there.
08 03 13 12 CC Roger. We're both right on that Barbados thing. The island is actually south, but we wanted some pictures to the north for oceanography-type things.
08 03 13 23 CDR Okay-dokey. That what you got. You got pictures to the north, and it's water and clouds.
08 03 13 28 CC Roger.
08 03 13 34 CC And Jim, on that second landmark tracking thing, the weather is a little bit marginal on that one.
08 03 13 43 CER Okay. I think our intrepid tracker can probably nail it down, though.
08 03 13 48  CC  Very good.
08 03 13 54  LMP  The marginal we handle routinely; the impossible we attempt.
08 03 13 59  CT  Okay. Got you.
08 03 16 29  CC  Apollo 9, Houston.
08 03 16 35  CMP  Go ahead, Houston.
08 03 16 39  CC  Roger. We're thinking of putting in a backup GDC align at 196 hours there - just to let you know, I'll pass up some data on it a little bit later on.
08 03 16 44  CMP  Fine. Okay.
08 03 16 51  LMP  And, Houston, just north of us right now by about 70 or 80 miles, there's a very, very symmetrical cyclonic pattern of clouds out there - anticyclonic, I'm corrected.
08 03 17 07  CC  Roger.

TEXAS (REV 1/4)

08 03 26 14  CMP  Okay. Houston, Apollo 9.
08 03 26 17  CC  Apollo 9, Houston. Go.
08 03 26 26  CC  Apollo 9, Houston. Go ahead.
08 03 26 29  CMP  Houston, Apollo 9.
08 03 26 31  CT  Roger. Go ahead.
08 03 27 23  CC  Apollo 9, Houston.
08 03 27 30  CDR  Go ahead, Houston. Apollo 9.
08 03 27 31  CC  Roger. I have you now. I read you a while ago, but you weren't reading me.
08 03 27 37  CXP  Roger. Houston, Apollo 9. How do you read?
08 03 27 40  CC  Loud and clear, tex.
08 03 27 41  CXP  Okay. Got five good Marks on Point Loma.
08 03 27 46  CC  Hey, very good.
08 03 27 46  CMP  Gee, and the surf looks great down there.
08 03 27 52  CC  (Laughter)
08 03 28 10  CC  Apollo 9, Houston. I think you have to proceed on your display now for us to get the Werk data down here.
08 03 28 17  CMP  Oh, okay. I'm going to go all the way through the program. Right now ...
08 03 28 20  CC  Oh, okay. Good.
08 03 29 57  CC  Apollo 9, Houston. I've got the roll, pitch, and yaw align angles for your GDC align there, if you want to copy.
08 03 30 15  LMP  Okay. Go ahead...
08 03 30 17  CC  Roger. Roll align, 246; pitch, 315; yaw, 051; the south set stars. We'd like to leave the CM and IMU powered up for this alignment. Your GDC ball angles will be 180, 180, and 0.
08 03 31 01  LMP  Okay. I understand. Roll, pitch, and yaw at 246, 315, 051, south set stars. Leave CM, IMU powered up, and GDC ball angles: 180, 180, 0.
08 03 31 12  CC  Roger. And once you get to your GDC align attitude, can you hit us a VERB 06, NOUN 22 to compare the IMU angles with what we think they ought to be?
08 03 31 25  LMP  Roger.
08 03 31 31  CC  9, Houston. That's VERB 06, NOUN 22, instead of 22.
08 03 31 36  LMP  Roger.
08 03 31 55  CC  Apollo 9, Houston.
08 03 31 57  CMP  Go ahead.
08 03 32 00  CC  Roger. Can you record these? And just to let you know what we think they ought to be - Roll ought to be 180.4; pitch, 237.5; and yaw, 0.5.
08 03 32 16  CMP  Okay. 180.4, 237.5, and 000.5.
06 03 32 20  CC  Roger.
(GOSS NET 1) Tapo 125

<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Comment</th>
</tr>
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<tbody>
<tr>
<td>08 03 51 24</td>
<td>CC</td>
<td>Apollo 9, Houston through Ascension.</td>
</tr>
<tr>
<td>08 03 52 43</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>08 03 53 32</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>08 03 53 52</td>
<td>CMP</td>
<td>Apollo 9, Luna and clear.</td>
</tr>
<tr>
<td>08 03 53 38</td>
<td>CC</td>
<td>Roger, I don't know if I mentioned it on that backup GM align, we do not - I say again, do not want you to cage the EMJ.</td>
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END OF TAPE
Apollo 9, Houston through Guam.

Hello, Houston, Apollo 9.

Roger. We need your P22 data there. If you just call it up again, I think we can get it.

Okay. To work.

Houston, we'd like to run this optics GNC align again on the next pass. We'll have to stay powered up until about 197 40 or something like that.

Roger. We concur.

And, 9, Houston. I have a target of opportunity.

Okay. Go ahead.

Roger. At time 197 13 00 it will be Equador, geology, ten frames, 10 seconds, on track.

Okay. 197 13 00, Equador, geology ten frames, and 10 seconds on track.

Roger.

And, Houston, 9. Those are the right numbers for the second landmark.

Roger. I guess just go ahead and call P22. That 89 just won't quite hack it.

Oh, okay. You want me to just read you the NAV 89? You want the whole P22 again?

No. Just call up P22 so we can get the Mark data.

Okay.

How far would you like to go in P22?

Just call it up. That's all we need.

Okay. Fine. And it was sort of cloudy over there, and I didn't get identification until we were just about overhead, but didn't get by part 2.
08 04 36 37  CCR  Also.
08 04 36 38  CC  Okay.
08 04 36 39  LMP  Also, Houston, it appeared the time overhead was
off by almost a minute.
08 04 36 49  CC  Roger.
03 04 37 39  CC  Apollo 9, Houston.
06 04 37 42  CCR  Go ahead, Houston.
00 04 37 43  CC  Roger. The computer is yours now, and we'll
delay the memory dump and state vector update
another REV here.
08 04 37 55  CCR  Okay.
08 04 37 57  CC  And do you have any results at all on that CDC
and align?
08 04 38 03  CCR  Yes. Just a minute.
08 04 38 06  CCR  I guess we went through it and learned a few
things, I guess, relative to history and how the
procedures have changed. We did it wrong the
first time and we'll go back and do it right this
time and then when we get back down we'll want
to talk about it some.
08 04 38 22  CC  Okay. I understand.
08 04 39 00  CCR  Houston, this is Apollo 9.
08 04 39 02  CC  Houston. Go.
08 04 39 04  CCR  We'd like to work out a - we'd like to use the
procedure that we used or worked out about 4 or
5 years ago on this thing and see how it compares.
Okay?
08 04 39 17  CC  Okay. I don't know if anybody has got that procedure
around, but we'll see.
08 04 39 21  CCR  It all ends up the same way. We'll just use the
same numbers and it should work the same way.
08 04 39 27  CC  Okay. Very well.
08 04 39 34  CCR  We'll use the procedure and get you the right
numbers. Does that sound?
08 04 39 37 CC That sounds good. And watch your gimbal lock as you are maneuvering around. That's all we have got to say.

08 04 39 46 LMP Yes. It dips right in there, doesn't it?

08 04 39 47 CC Yes. Gets pretty close, I think.

08 04 39 50 LMP You'll really have a good time watching this time.

08 04 39 54 CC Okay.

08 04 41 05 CMP Houston, Apollo 9.

08 04 41 07 CC Houston. Go.

08 04 41 10 CMP Roger. Can you get us another map update here?

08 04 41 13 CC Roger.

08 04 41 20 CC Here we go. REV 124: at 196 plus 29 plus 12; right ascension, 15 17; longitude, 112.66 east.

08 04 41 48 CMP Okay. REV 124: 196 29 32; and the longitude is 112.66 east.

08 04 41 56 CC Roger.

HAWAII (REV 124)

08 04 50 47 CC Apollo 9, Houston through Hawaii.

08 04 50 52 LMP Go Houston.

08 04 50 55 CC Roger. Our crew plan this evening is essentially the same. However, I guess you noticed that the exhaust temperature on fuel cell 2 has stayed pretty much constant today. So what we would like to do is essentially maintain the same power load without any large changes, either up or down. In addition to the powerdown procedure we had last night, when you power down your GPS stuff, put in burner 3 on MAIN A and put the rendezvous transponder switch to POWER.

08 04 51 39 LMP Houston, do you read Apollo 9?

08 04 51 42 CC Roger. Loud and clear. How net:
<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 04 51 44</td>
<td>LMP</td>
<td>You're a little broken. I understand that when we power down the IMU in the SPS you want us to put the rendezvous transponder switch to POWER and the burner 3 to MAIN A.</td>
</tr>
<tr>
<td>08 04 51 55</td>
<td>CC</td>
<td>That's affirmative.</td>
</tr>
<tr>
<td>08 04 51 57</td>
<td>LMP</td>
<td>Okay. And on the cryos you want to let the pressure drop down between 190 and 200 on the hydrogen, and then we're going to turn one of the fans on until it's time for number 1, I guess.</td>
</tr>
<tr>
<td>08 04 52 10</td>
<td>CC</td>
<td>No. We're going to use tank 2 again tonight. Tank 2 fan ON just prior to going to sleep.</td>
</tr>
<tr>
<td>08 04 52 15</td>
<td>LMP</td>
<td>Okay, tank 2 fan ON tonight.</td>
</tr>
<tr>
<td>08 04 52 20</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 04 52 45</td>
<td>CC</td>
<td>And, Apollo 9, Houston.</td>
</tr>
<tr>
<td>08 04 52 48</td>
<td>CMP</td>
<td>Go ahead. Houston, 9.</td>
</tr>
<tr>
<td>08 04 52 50</td>
<td>CC</td>
<td>Roger. I guess our S065 countdown here shows about 97, and you said 105. Can you recheck that?</td>
</tr>
<tr>
<td>08 04 53 02</td>
<td>CMP</td>
<td>Roger. We'll get it in just a second, and do you have any BIOMED data on the LMP, yet?</td>
</tr>
<tr>
<td>08 04 53 09</td>
<td>CC</td>
<td>Roger. Stand by.</td>
</tr>
<tr>
<td>08 04 53 45</td>
<td>CC</td>
<td>Apollo 9, Houston. Still looks the same down here on the LMP.</td>
</tr>
<tr>
<td>08 04 53 50</td>
<td>CDR</td>
<td>Looks the same, huh? Well, he checked the electrode and they are nice and damp and the electrode paste looks fine. Guess we'll work on it some more.</td>
</tr>
<tr>
<td>08 04 54 01</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>08 04 54 06</td>
<td>LMP</td>
<td>Say, incidentally, that last bunch of landmark tracks was with the telescope rather than the sextant ... identification ...</td>
</tr>
<tr>
<td>08 04 54 22</td>
<td>CC</td>
<td>Apollo 9, Houston. You faded on that one. Say again.</td>
</tr>
</tbody>
</table>
Say again, Houston.

REDSTONE (REV 124)

Apollo 9, Houston through Redstone.

Roger, Apollo 9. Go.

Roger. I missed your last comment there in Hawaii.

Oh yes, I just mentioned that the second group of marks on the second sight - for the marks on the second sight that were made from the telescope, not the sextant, because of the visibility problem.

Okay. Understand. Incidentally, it looks like on that first set of marks the 121 alarm would not have rung anyhow, even - even if we had not disabled it.

Well, that's very interesting. Very good.

Yes.

Houston, I checked the S065 magazines and we are reading about 104 or 105.

Okay; understand.

TENAS (REV 124):

Apollo 9, Houston.

Hello there, Alie; how are you?

Pine, Jimmy; how are you tonight?

Pretty good.

If you're ready to copy, I've got some block data for you.

Just a minute.

Okay.
08 05 00 53  CDR  Okay. Go ahead.

08 05 00 55  CC  Alrighty. 127 3 Alfa, plus 316, plus 1485 20; 07 09 31.7; 125 3 Bravo, plus 259, plus 1450 20; 17 15 3819; 129 Delta Charlie, minus 220, minus 1602 04 35 30 4829; 130 Alfa Charlie, minus 064, minus 0270 205 00 37 5518; 131 Alfa Charlie, plus 120, minus 0325 205 35 07 4797; 132 2 Alfa, plus 264, minus 0280 205 13 15 3789; 133 Alfa Charlie, plus 231, minus 0589 209 41 36 40; 134 3 Alfa, plus 260, minus 0680 211 16 44 362. The SIS trims are pitch, minus 0.64; yaw, minus 0.94; and hold your readback for a minute.

08 05 04 32  CDR  Holding.

08 05 04 33  CC  9, Houston. I would like to give you some pointing data here. It's going to be coming pretty close here on this Pegasus.

08 05 04 40  CDR  Okay. Have at it.

08 05 04 42  CC  At 197 plus 13 plus 00, if you roll 00.89, pitch 178.4, and yaw 062.7, you will pick it up at about 1100 miles. Four minutes later, it will be into 100 miles.

08 05 05 15  CC  And your closest point of approach will be about 67 miles below it - or behind it, I mean - 77 miles below it, and 35 miles to the right.

08 05 05 31  CDR  Well, how about that. Let's see if I got the numbers right. 197 13 00. Is that the right time?

08 05 05 38  CC  Affirmative. That's when it will be a thousand miles off, it really booms in.

09 05 05 41  CDR  I believe it. And then the roll - Say again the roll; I missed that.

08 05 05 46  CC  Roll is 8.9 degrees.

08 05 05 49  CDR  Okay. Roll, 8.9; pitch, 178.4; and yaw, 062.7.

06 05 05 55  CC  Yes. I don't know if you will be able to track it in or not, but it might be worth a try. Try a little Kentucky windage there.

08 05 06 01  CDR  Okay. We've got a lot of windage up here.
Okay.
Hey, Houston, Apollo 9.
Houston. Go.
Here we've been trying to avoid that red dot on the ball all day and look what you gave us for yaw.
Yes, it's pretty close there.
We will watch it.
What kind of odds are you giving whether we go in it or not?
Well, the tracking is supposed to go the other way, and the yaw gets better.
Alrighty.
Apollo 9, Houston.
END OF TAPE
TANANARIVE (REV 125)

08 05 42 56 CC Apollo 9, Houston through Tananarive.
08 05 43 00 CDR Go ahead, Houston; this is Apollo 9.
08 05 43 09 CC Roger. Apollo 9, Houston. I guess we have a few minutes here at Tananarive. We can get some of this stuff out of the way, I guess, just for planning purposes. When you get to Hawaii, we'll get the I-Memory dump, the state vector update, consumables, and your P2O readings. I guess while we are here at Tananarive we can get the block data readback.

08 05 43 27 CDR Roger. ...
08 05 43 56 CC Apollo 9, Houston. How do you read now?
08 05 46 09 CC Houston, Apollo 9. You are still coming through unreadable.
08 05 46 14 CDR Apollo 9, Houston. How do you read now?
08 05 46 19 CC Reading a little better, Houston.
08 05 46 38 CMP Roger, Apollo 9. Understand. Reading a little better. Communications here are not too good. Did you get a chance to see Pegasus?
08 05 46 53 CC Houston, how do you read Apollo 9? We didn't get a chance to. We really didn't see it. We may have caught a glimpse of it, but we couldn't track it ...

GUAM (REV 125)

08 06 13 34 CC Apollo 9, Houston through Guam.
08 06 13 50 CDR Go ahead. Houston, Apollo 9.
08 06 13 45 CDR Go ahead. Houston, Apollo 9. How are you?
08 06 13 49 CC Roger. Apollo 9, Houston. Reading you fairly weak. I guess we could use some of this pass to tell you what we are going to do over Hawaii.
Okay. Go ahead.

When we get a clear signal over Hawaii, we'll do an E-memory dump, then a state vector update; and, if you're ready, I'll get your consumables and PAM." I guess this is a good time to remind you of the waste water dump. We want you to dump to not more than 20 percent tonight - not more than 20 percent, and remind you of the CO₂ change in the water chlorination and termination of BATF charge.

Okay. Very good. We'll terminate BATF B charge now, and understand you want us to dump to 20 percent tonight on the waste water.

That's affirmative.

Okay. We'll be prepared to give you an E-memory dump, and we'll be ready for state vector update. As soon as we are through with that, we'll give you the consumables ...

Yes. Roger, Apollo 9. We'll pick you up over Hawaii at about 25.

Okay. Very good. And we'd like to tell you that our GDC alignment was successful.

Houston, are you still there?

Apollo 9, Houston. Roger. Still here, but we're reading you very weak.

Roger. We said the GDC alignment was successful ...

Roger. Understand the GDC alignment was successful.

...
We're ready; you ready?
I'm ready.
Okay. Service module A, B, C, D: 52, 54, 55, 51. BATT C, 6 pyro A and B: 36.9, 37.1, 47.1. And the injector temperatures, 5 Charlie and Delta: 4.9, 4.9; 6 Alfa, Bravo, Charlie-Delta: 4.8, 4.8, 4.9, 4.8. The FRD's: Commander, 31 20; CMP, 62 22; IMP, 80 22.
Roger. Consumables: 52, 54, 54, 51; 50.9, 37.1, 57.1; 4.9, 4.9, 4.8, 4.9, 4.8. And the FRD's: 31 20, 62 22, and 80 22.
That's Charlie.
Hey, you want some angles on the GDC align?
Okay. Fire.
Okay. 180.36, 236.10, 359.78. And that was after the maneuver to 180, 180, 0, which took us like about 28 minutes.
That's Charlie. And you want your block data back?
Okay. We might as well go ahead and get that now.
Hey, before you get that, the maximum radiation going through the anomaly was 0.037 RADS per hour.
Roger. Understand the radiation survey reading was 0.037 RADS per hour.
Righto.
Okay. You can give me the block data readback if you like.
All right. Are you ready now?
Yes.
Okay. 127 " Alfa, plus 316, plus 1485 201 07 093147; 128 " Bravo, plus 270, plus 1450 20 17 15 3838; 129 Delta Charlie, minus 225, minus 18.0 204 33 30 1229; 116 Alfa Charlie, minus 605, minus 1270 205 09 07 5538; 131 Alfa Charlie, plus 14.0 04 0325
206 35 07 4779; 132 2 Alfa, plus 264, minus 0269
206 13 15 3769; 133 Alfa Charlie, plus 321,
minus 0598 209 41 36 4044; 134 1 Alfa, plus 286,
minus 0680 211 16 48 3622. With a pitch trim
of minus 0.64 and a yaw trim of minus 0.94.

08 06 30 54 CC Roger. Apollo 9, Houston. Copy correct.
08 06 30 53 LMP Okay.
08 06 30 52 CC Okay. And we're ready for the E-memory dump
if you'll give us the VERB 74 ENTER.
08 06 31 04 CMP Okay. On my Mark. 3, 2, 1.
08 06 31 09 CMP MARK.

REDSKETE (REV 125)

08 06 32 31 CC Apollo 9, Houston at Redstone.
08 06 32 29 CDR Go ahead.
08 06 32 30 CC Roger. We're not sure we got all that E-memory
dump; would you do it again for us, please?
08 06 32 35 CDR Oh, yes; we'll do it again.
08 06 32 36 CC Alright; that's very nice of you.
08 06 32 37 CDR Pleasure. All set?
08 06 32 40 CC All set.
08 06 32 42 CDR Roger. 3, 2, 1.
08 06 32 45 CDR MARK.
08 06 32 47 CC Apollo 9, Houston. We're ready to give you a
state vector if you'll give us ACCEPT.
08 06 33 42 CMP Roger. You have ACCEPT.
08 06 33 51 CC Roger.
08 06 34 01 CC And, Apollo 9, Houston. You might be advised
that we're reading Rusty's HIGHER now okay. Looks
like Dr. Scott's operation was a success.
08 06 34 12 CDR That's great. The operation was a success, but the
patient died.
What we did was - We took Rusty's sensors and moved them over on Dave.

We figured he was the only one with a heart strong enough to beat through.

No wonder the doctors are scratching their heads.

Hey, ask the Flight Surgeon on duty there if he can unscramble all of our EKG's, and he always knows who's hooked to which CCMX cable.

Yes, that's right. He's been able to do that.

Very good.

He knows you guys better than you do.

That's what bothers me.

Apollo 9, Houston. On that waste water dump, maybe I didn't make it clear. They want you to dump so that you have no more than 20 percent in the waste water. Dump down to 15 to 20 percent so that amount of water left at reentry will be correct.

Okay. That's what we'll do. We'll dump down to between 15 and 20 percent.

Alrighty.

Apollo 9, Houston. Your state vector is in, we've verified it for you, and you have the computer back.

Okay. Thank you.

Apollo 9, Houston.

Go ahead.

Roger. One last question. We'd like to know how much Hasselblad film you have left.

I think we have about a hundred frames.

Roger. Copy one hundred frames, and we're about to lose you here at Redstone.

Okay.
Okay. We're still showing you in ACCEPT, there, Jim.

Okay. We'll get cut in just a minute.

Okay. We'll be losing you in about a minute here at Redstone. I guess it's time for you fellows to get tucked in for the night.

Okay. We haven't eaten yet, so we'll be up for a while, if you can get hold of us.

Okay-dokey.

END OF TAPE
HAWAII (REV 126)

08 05 02 06 CC Apollo 9. Houston through Hawaii.
08 05 03 11 CPF Roger. This is Apollo 9.
08 05 03 13 CC We see that you all are not asleep yet, so we thought we'd give you a call and give you the update on the block data number 45.
08 05 03 21 CPF Okay. Stand by one.
08 05 03 23 CC Alright.
08 05 03 33 CPF Okay. Go ahead, Al.
08 05 03 40 CC Okay. It's on REV 127, and the updates are as follows: 127 Charlie Charlie, plus 177, minus 1650 201 21 04 3082. End of update.
08 05 04 04 CPF Roger. 127 Charlie Charlie, plus 177, minus 1650 201 21 04 3082.
08 05 04 15 CC That's correct, Dave.
08 05 04 18 CPF Okay. How's everything going down there?
08 05 04 20 CC Oh, it's going very quietly down here. How is it up there?
08 05 04 23 CPF Oh, very quietly up here. We're just sort of regrouping and getting ready.
08 05 04 27 CC You're about ready to go night-night?
08 05 04 30 CPF Well, we'll try to sort of get organized here so tomorrow night we can put everything in its proper place with a minimum of disturbance.
08 05 04 43 CC Dave, we'd like to confirm that you've got the H2O fans on in tank 2, and that you did do a canister change - CO2 canister change.
08 05 04 54 CPF That's correct. We did do a CO2 canister change on time yesterday - We haven't turned it on, we're going to turn it on just before we go to bed.
08 05 05 00 CC Alright.
Which will probably be in about 15 or 20 minutes.

Okay. We'll take a look at giving you an extra hour tomorrow.

No. I guess we'd just as soon get up on time tomorrow, and sort of get going so we have an even day tomorrow.

Okay. We're with you.

Apollo 9, Houston. We'd like for you to go ahead and turn that fan on in tank 2 now, if you would, please.

Very well. Fan ON now.

Roger. Thank you.

You are welcome.

Houston, 9.

Go ahead, 9.

Hey, Al. We just pulled the flight plan out and took a look at it, and there's really not much to do the first couple or three hours, so why don't you give us a ring about 209 in Carnarvon?

Dave. We'll see if we can work that one out. It looks okay from down here right now.

Okay. One thing we'd like to make sure we do tomorrow, is get all the S65's done.

Yes; you bet.

Alrighty. And one more thing. If you can't find any targets of opportunity for the spacecraft, don't worry about it. We'll be able to take plenty of pictures.

Okay. Copy that.

Lots of things to take pictures of up here.

Snow Biz.

END OF TAPE
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET 1)

Tape 133
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REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(BOSS NET 1)

CANNARY (REV 132)

08 16 49 24 CC Apollo 9, Houston.
08 16 49 30 CMP Hello, Houston, Apollo 9.
08 16 49 32 CC Boy, Dave, you sure do wake up in a hurry. I never have to call you more than once.
08 16 49 39 CMP Well, we're expecting you every morning.
08 16 49 42 CC Well, good morning and all that good jazz. We'll have to think up something jazzy to wake you up with tomorrow.

08 16 49 56 CC Hey, I've got a question here for you.

08 16 50 01 CMP Go ahead.

08 16 50 04 CMP Go ahead, Houston.

08 16 50 06 CC Okay. You're over the Canaries now. When you come across Australia, you're going to hit it with a - It's going to be almost sunset, but almost enough light for a picture. I was wondering if you could get a picture. It's generally dark down there, and we don't get many chances. This gives you about 30 minutes to get ready for it.

08 16 50 37 CMP Roger, Houston. We'll do that.

08 16 50 40 CC Okay. If you've got something to write on now, I'll give you a time.

08 16 50 44 CMP Okay. Go ahead.

08 16 50 47 CC 209 plus 27 plus 11, four frames, 10-second exposures, shooting on the nadir. You're shooting the west coast of Australia, there - Beroom, Australia - and it's for geology and oceanography.

08 16 51 10 CMP Okay. 209 27 11, four frames, 10-second intervals, on the nadir. We can get that one.

08 16 51 19 CC Okay. Real good. And like I say, it's coming up - It will be a little sun angle, but just we can hack it, and at your convenience, we'd like to have inverter 3 OFF, and the rendezvous radar transponder off.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 16 51 35</td>
<td>CMP</td>
<td>Okay. Inverter 3 is OFF and we'll go down and get the transponder.</td>
</tr>
<tr>
<td>08 16 51 39</td>
<td>CC</td>
<td>Okay. And we'd like to turn the fans off in both H₂ tanks.</td>
</tr>
<tr>
<td>08 16 51 46</td>
<td>CMP</td>
<td>Okay. H₂ fans are both OFF.</td>
</tr>
<tr>
<td>08 16 51 51</td>
<td>CC</td>
<td>Okay. Our good old FCS configuration for the dry will be quad Baker and Charlie, and Baker Delta roll.</td>
</tr>
<tr>
<td>08 16 52 04</td>
<td>CMP</td>
<td>Okay. Baker and Charlie, and Baker Delta roll.</td>
</tr>
<tr>
<td>08 16 52 08</td>
<td>CT</td>
<td>Okay. And make that H₂ tank 1 fan ON, please.</td>
</tr>
<tr>
<td>08 16 52 15</td>
<td>CMP</td>
<td>Okay. H₂ tank 1 fan is ON.</td>
</tr>
</tbody>
</table>

**MADRID (REV. 132)**

<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 16 52 23</td>
<td>CC</td>
<td>Very good. And you might whip up your old S-band volume, there. We'll have Madrid here for 4 or 5 minutes.</td>
</tr>
<tr>
<td>08 16 52 31</td>
<td>CMP</td>
<td>Okay. S-band is up.</td>
</tr>
<tr>
<td>08 16 52 43</td>
<td>CDR</td>
<td>Houston, how do you read Apollo 9?</td>
</tr>
<tr>
<td>08 16 52 45</td>
<td>CC</td>
<td>I'm reading you loud and clear, Jim.</td>
</tr>
<tr>
<td>08 16 52 49</td>
<td>CDR</td>
<td>Okay. Like you say, it wasn't getting out before, I guess I just didn't have all these things plugged in quite right. One of my things keeps coming loose.</td>
</tr>
<tr>
<td>08 16 52 59</td>
<td>CC</td>
<td>Maybe it's wearing out. Good morning.</td>
</tr>
<tr>
<td>08 16 53 01</td>
<td>CDR</td>
<td>Hello there.</td>
</tr>
<tr>
<td>08 16 53 04</td>
<td>CDR</td>
<td>Hey, I've got a little question. How come we almost never use quad A? At least it seems to be the least one that we require the least out of for service module RCS deorbit, yet we seem to have the most fuel in it.</td>
</tr>
<tr>
<td>08 16 53 23</td>
<td>CC</td>
<td>Okay. Stand by one, here, and let me give you a good answer on that.</td>
</tr>
</tbody>
</table>
08 16 53 39 CC Okay, Apollo 9. The answer is that we are trying to hang on to the SPS deorbit capability.

08 16 53 53 CDR Okay. That's a pretty good answer.

08 16 54 23 CDR Okay. All set. Go ahead.

08 16 54 25 CT All right. Hours 209 10 42 38 13 39 13 2 4 3 15 31 33 39; and your DAP red lines: 25 31 34 34. End of update.

08 16 55 08 CDR Roger. 209 10 42 38 13 39 13 2 4 3 15 31 33 39 25 31 34 and 34.

08 16 55 24 CC That is affirmative, and that's correct.

08 16 55 28 CDR Okay.

08 16 55 51 CC And, Apollo 9, Houston. We'd like to start a battery A charge at 209 plus 25.

08 16 56 01 CDR Roger. 209 plus 25 for battery A charge.

08 16 56 06 CC That's correct and I'll wait until we get over Carnarvon for the rest of the block data - I mean to get the block data and the rest of the flight plan updates - so we'll probably then lock Madrid here within a minute. It will be Carnarvon at 24.

08 16 56 22 CMP Roger. You don't happen to have a handy map update, do you?

08 16 56 26 CC That is affirmative. Your map update: 208 34 44, 73 degrees west.

08 16 56 41 CMP Roger. That's pretty snappy. 208 34 44, 73 degrees west.

08 16 56 47 CC Roger, Doc. And I want to get that for you. I had it all sitting out here and blew it.

08 16 56 52 CMP Oh, listen. That's all right. See you later, you must have all these things planned out here...
08 16 56 57 CC No, I had - I had just updated my rap here to check that Australia bit. And we'll see you down there. I hope you make it before sunset.

08 16 57 07 CMP On, we'll make sure. We wouldn't miss Australia for anything.

08 16 57 12 CC Hey, look at this rare opportunity you have. Australia in the daylight.

03 16 51 16 CMP Now about that!

CARNARVON (REV 132)

08 17 26 04 CC Apollo 9, Houston through Carnarvon. Standing by.

08 17 26 08 LMP Roger.

08 17 26 10 LMP Fine. We're all set to take pictures.

08 17 26 15 CC Very good. Looks like you're in a race with the terminator.

08 17 26 19 LMP Yes. It sure does; it's getting dark pretty quick.

08 17 26 22 CC Roger. I checked the sunset time on that. On the ground you'll be taking with about 2 minutes or a little over before sunset. We'll say a 5-degree sun angle.

08 17 29 27 CC And, Apollo 9, Houston. Bring up your S-band volume. We'll be going over Honeysuckle in about a minute.

08 17 29 35 CMP Okay.

08 17 29 39 LMP Looks like all those people down in Australia are probably still asleep.

38 17 29 53 CC Well let me see, they shouldn't have gone to bed yet, should they? It just got dark across there.

08 17 30 00 LMP Oh, that's the way the sun goes. It goes from east to west. I thought it went from west to east.
(G OSS NET 1)

08 17 30 06    CC  (Laughter) Well, I've got a gouge here. I can call up the display and I can watch the terminator move so I don't have to do any thinking.

08 17 30 13    CMP  Stu, would you send that gouge up here?

08 17 30 15    CC  Roger.

08 17 30 32    CC  And we'll have Honeysuckle about 7 or 8 minutes. It might be a good place to get the block data at you all's convenience. When you get through looking across the mainland, there.

HONEYSUCKLE (REV 132)

08 17 31 35    CC  And we've got you locked up on Honeysuckle now - about 6 minutes.

08 17 31 40    CMP  Okay. You're loud and clear on old Honeysuckle today.

08 17 31 44    CC  You're coming in five-square.

08 17 31 51    CDR  Is it really only 3:30 in the morning in Houston?

08 17 31 55    CC  That's affirmative.

08 17 32 01    CC  I always hate to mention that - the time - because I thought it might make you (laughter) harder to get up.

08 17 32 08    CMP  If I'd just known then what I know now.

08 17 32 42    CC  Come on, now.

08 17 33 17    CC  Apollo 9, Houston. We'd like to know if you happened to notice any stratification when you stirred the cryos this morning.

09 17 33 30    CMP  Yes; we haven't done it yet, Stu.

09 17 33 32    CC  Okay; very good. We've just seen some bubbles on our last data pass, there.

09 17 33 40    CMP  All I've done is turn off the H₁ fan and turn on H₁ fan.

08 17 33 48    CC  Okay. Understand.
Of course we've turned the transponder on, too.

Very good.

How about a crew status report if you're up there; we'll make the surgeon happy. Just get that out of the way right off.

Okay. The commander had about 7-1/2 hours sleep and one vitamin pill.

And the CMP had about 7-1/2 hours sleep and a vitamin pill.

And the LMP had about 6-1/2 hours sleep and one vitamin pill.

Roger. Copy all that, and good morning, Rusty.

And, Apollo 9, Houston. We're about 30 seconds from LOS Honeysuckle. Mercury around 42.

Okay. I think we'll stop and have breakfast now.

All right. Sounds like a good idea.

Apollo 9, Houston through Mercury. Standing by.

Roger.

Houston, Apollo 9.

Go ahead, Apollo 9.

Roger. Our power was down a little bit there so we just put the transponder back on to keep that same power we would on the fuel cells.

Roger. Copy.

Apollo 9, Houston. One minute LOS; we'll see you over the sunny Caribbean around 10.

Okay. We'll be ready.
MILA (REV 133)

08 18 11 59 CC Apollo 9, this is Houston. We've got you through Mila. Standing by.

08 18 12 05 CT Roger, Houston.

08 18 12 14 LMP Hey, Smokey. One thing that we're a little concerned about here, this morning we're going to be dipping back into a magazine of film that was taken with a slightly faulty camera. On the EVA we took the 70mm wide angle out with magazine Echo on it and we found out subsequent to the EVA that the superwide was keeping the shutter open too long, or at least we think that it did, so we ran off an extra 10 or so frames with nothing on them. Now we're going to use the remaining 100 today, so we want to make sure that when that film pack gets back that the photo people know about it that the first part of the film, the first third, may be exposed different from the last third - for the last two-thirds, rather.

08 18 13 10 CC Okay. Understand now. To make sure that we got that, that 70mm and the magazine is Echo.

08 18 13 18 LMP That's affirmative. We're not really sure when the camera malfunctioned, so the first third may also be okay, but we don't have any way of knowing it. We know that the superwide keeps the shutter open for about three to five times as long as it should, it looks like, and so we're going to need special handling on the first third of that roll of film.

09 16 13 42 CC Okay. Suspect the superwide may have kept the shutter open two to three times normal. And on that same subject, Rusty, we were just kicking around here, a 16mm magazine is the word I have that may have been exposed at a wrong setting during EVA. Is this correct?

08 16 14 15 LM Yes. That's affirmative, Houston. Two of the 16mm magazines may have been exposed at the wrong setting.

08 18 14 26 CC Okay. At your convenience would you like to give us that magazine identification so we could make sure that we get it on.
Okay. We'll have to find out what the number of it was.

Roger, I suspect it's probably buried down somewhere, but anyway you'd like - But we would like to know it so we could warn people.

Okay. Well it was - We took some of the stuff apparently set at 1/60 and the rest of it at 1/250, so it's going to be a little tough to retrieve, I think. Let me get the magazine letter for you.

And, Apollo 9, Houston. There are a couple of targets we'd like photographed on this rev if you're so inclined. One is around the Red Sea area about 15 minutes from now and the other one is about 17 minutes after it.

Houston. I believe the magazine letter was P, magazine Peter, Papa, and we took about two-thirds of it during the EVA. The first part of it was probably exposed at 1/60 of a second and the remainder at 1/250.

Roger. Copy. You exposed two-thirds of it during the EVA, and the first third at 1/60 and the rest at 250.

Roger. And they're the same subject material for it.

Roger. Copy. Thank you very much.

Okay.

Okay. Go ahead with the updates. Stu, the photo update.

Okay. The first one: time, 210 plus 39 plus 34; seven frames; 16-second interval; zero degrees; and this will be the Red Sea; oceanography. The second one: time 2 plus 10 plus 52 plus 07; three frames; 20-second interval; you'll be shooting north of the nadir 30 degrees. This is weather and should be a tropical depression up there.
VANGUARD (REV 133)

Okay. Let me see if I got these right: 210 39 14, seven frames, 16-second intervals, zero degrees, Red Sea, oceanography; 210 50 07, three frames, 29 seconds, north 50, weather, tropical depression.

Okay. The time on the Red Sea is 39 plus 34.

39 plus 34. Okay.

And the time on the tropical depression is 52 plus 07.

52 07. Right.

And, Apollo 9, I have some block data. At your convenience, I'll pass it to you.

You're still good for about another rev and a half, so not sweat on the time.

Okay. Let's go ahead and start it now.

Say again, Rusty.

Yes, I'm ready to copy, Stan.

Okay. I'll tell you what, Rusty, we're through the Vanguard now and it's a little static. Let's wait until we get handed over to Canaries. I think it would be better.

Okay.

CANARY (REV 133)

Apollo 9, Houston. How do you read?

Five-square, Houston.

Okay. I have block data number 21 when you're ready to copy.

All set.
Reading: 135 2 Bravo, plus 292, minus 0270 213 16 11 3250; 126 2 Bravo, plus 226, minus 0330 214 53 00 3320; 137 1 Alfa, plus 276, minus 0641 216 19 52 3330; 138 4 Alfa, plus 331, minus 1624 218 58 21 3232; 139 4 Alfa, plus 331, minus 1624 220 39 20 3026; 140 4 Baker, plus 286, minus 1640 222 20 10 3000. Would you bring up your 3-band volume here before I continue? We'll be handing over into Madrid shortly. And pitch, minus 0.64; yaw, minus 1.94. End of update.

MADRID (REV 133)

Okay, Stu. Readback: 135 2 Bravo, plus 292, minus 0270 213 16 11 3250; 136 2 Bravo, plus 226, minus 0330 214 53 00 3320; 137 1 Alfa, plus 276, minus 0641 216 19 52 3330; 138 4 Alfa, plus 331, minus 1624 218 58 21 3232; 139 4 Alfa, plus 331, minus 1624 220 39 20 3026; 140 4 Bravo, plus 286, minus 1640 222 20 10 3000. Pitch, minus 0.64; yaw, minus 0.94.

Roger. That readback is correct. Thank you.

Okay.

And, Apollo 9, about 1 minute LOS Madrid; and we'll see you over Carnarvon around 58.

Roger. Carnarvon at 58.

CARNARVON (REV 133)

Apollo 9, Houston through Carnarvon.

Roger, Houston.

And, Apollo 9, Houston. We'd like to use Alfa Charlie's roll today, instead of Baker Dog as we passed up before.

Understand: Alfa Charlie roll instead of Bravo Dog.

That's affirmative, and just a little note on that. What we'd like to do is get into that secondary propellant tank on one of the quad and to think that'll probably be quick, and this isn't urgent...
any of our deorbits. We'll still have our SCS deorbit capability.

08 18 59 44 LMP Okay.

08 18 59 48 LMP The action has been took.

08 18 59 51 CC Very good. Thank you.

08 18 59 56 LMP Say there, word to miracles. What's the balance picture in the surface in the recovery area?

08 19 00 06 CC I can find that out for you. I have neglected to mention that subject so far here. I was going to wait until you brought it up.

08 19 00 27 LMP I was afraid you were going to --

08 19 00 44 CC And, Apollo 5, Houston. I have you about another 6-1/2 minutes to Caramarvon here, and I have five or six items on the flight plan update for today.

08 19 00 56 LMP Okay; stand by.

08 19 01 24 LMP Okay. Go ahead, Stu.

08 19 02 54 CC Okay. The first one is at 212 plus 38 and I'll just make this comment now which will apply later in here. As you see it in your timeline everything is shifted around 20 minutes or so due to the orbit, so if it looks like night or day or something is off, well that's the reason. But at 212 plus 38 we'd like to have a P51, P52 alignment to P53 to CENTRAL, and your T-align is 216 plus 10 plus 00.

08 19 02 54 CC Okay. Now, at 214 plus 50 - and want to make sure we don't get confused here. I'm deleting the second S065 pass here the one that's shown for over Africa. Now in your flight plan that's shown right around 215, but that is the pass. We're deleting that S065 pass due to weather. We still want the first S065 pass across the States, and we'll have a pass for you later on that. Okay. Now, 215 plus 38 for P52 to CENTRAL. And at 217 plus 10, we'd like to have a SCS calibration.

08 19 02 54 CC Now, you gave us a real good alignment yesterday with the SCS, and on the change of start of the flight planning people here. I can't find any good details on why we want another one. I think there's a requirement for says you still in the
day before reentry. But it looks like your probably got a good one, but we'll stick that one in there - 217 plus 10. And at 217 plus 60, we'll do some 552 landmark tracking.

Your payload will be 218 plus 35, and at 219 plus 10 we'll have a fuel cell 0.0 purge. And that's the end of it.

Okay. At 35 552, 52 to nominal 216 10 00. At 214 we want to do the second SO65 pass over Africa due to weather. We still want to keep the first one across the states. 215 30 552 to REFERENCE; 110 COAS calibration; 217 50, 552 landmark track; 218 30, power down; 219 00, fuel cell 0.0 purge.

That's affirmative, Dusty. You got them all. And I'd just like to ask a question on curiosity; I was wondering how that T and X panel worked out.

Oh, that works great, Stu. Good job on that.

How about with the corona pack? Do you get - Does it fit in there all right? You know we really need a mount around that, and I was wondering about the light leak around the edge.

Well, I had trouble getting the VEB-NOUN list out. It took me about 5 days to get that out, and when I finally got that out, I haven't had a chance to put the corona pack up.

You mean it was jammed in there?

Yes, it sure was.

Ouch; that doesn't sound like it was so good. Sorry about that.

Oh, no sweat. I think we'll work that out when we get back.

Stu, I have a question on the SO65. Looks like we have many more frames of film left on the camera there than we were allocated for pictures today. I don't thin we ought to come back with any film left in those cameras.

Roger. Copy, Stu.
And I guess what i'm saying is that soon as we get through with those S065's that are programed, I think we'll just leave it in the window and take pictures until we run out.

Yes, we're going to use it all today and it's being planned that way.

Oh, okay... Inc.

...and,Jim, just to clarify it, this 16mm roll taken during EVA that you exposed 2/3 of it - that all that has been exposed on that roll, is that affirmative?

That's affirmative. We're going to go take some run going down into the water pictures with the rest of it.

Okay. Very good. So the rest of it will be exposed, but we're really looking at the first 2/3 of it on the EVA.

That's affirmative.

Okay. Real good.

We've got to make sure that's developed right.

Roger.

And let's have 3-hand volume up, please.

You took part of it at 1/50. All with the same subject matter.

Apollo 9, Houston.

Apollo 9, Houston.

Apollo 9, Houston through Mercury.

Roger, Houston... You're coming five-square.

Reading you real good, and we'd like to have the fan in B2 tank 1 ON at this time.

Okay.
08 19 18 42 CC Roger. Thank you. And I have the temperatures in the recovery areas: water temperature is 69; the air temperature is 64. That's as of 1000 Z this morning.

08 19 19 01 CDR Okay. They have the forecast with them for tomorrow, Stu, as far as temperatures or anything else goes?

08 19 19 10 CC Well, we've got a forecast yes. I suppose you're interested in that?

08 19 19 21 CKP The way you worded that, you stimulated our interest.

08 19 19 29 CC Okay. Now I don't know what to say.

08 19 19 54 CC Okay. Here's the way it stacks up. I'll read it to you straight: 150 kts, 3000 scattered; variable broken, high broken clouds, 10 miles visibility; wind 310 at 20 knots; waves 6 to 8 feet; swell 10 to 12 feet. How does that sound?

08 19 20 07 CMF Nice visibility.

08 19 20 11 CC Hey. That was a beautiful answer. Okay. 152 kts 2000 scattered; 10 miles visibility; wind light and variable; waves 2 to 3 feet; and swell 6 to 7 feet.

08 19 20 30 CDR Hey, let's go there! Let's go there!

08 19 20 33 LMP Yes. Take a pick, Stu.

08 19 20 35 CC Roger.

08 19 20 40 CDR Gee, you sure made that dramatic, Stu.

08 19 20 47 CC The weather I read you first was the prime recovery area.

08 19 20 53 CDR Are they still considering it to be the prime one or are they going to shift it down one rev?

08 19 21 02 CC This has not been decided yet, sir. Of course, that will come here within a few hours. But just reading the weather, I'm sure you can make that decision, also.
Yes. What kind of backup capabilities do we have if we don't get an SPS RETRO and have to do service module RCS RETRO for the following rev? Where does that put us with respect to land? Will we still come down on the water?

Okay, Jim: That's what we're hustling so much over here right now, and what's making the RETRO all grey-headed. We don't have one on the next rev in the Atlantic, so that's what gets this hurry, is the - that we go to the backup area here, which the weather certainly dictates. Well then, that puts us into the Pacific for a backup deorbit.

Okay. If we go into the Pacific, how does the propellant requirement change with respect to the anomaly for RETRO into the Pacific?

No real change, Jim; and I think we're looking, what? Around Hawaii - is it that - The backup landing area is in the Hawaii area.

Okay, I think I know which way we all want to go. I think you probably know which way we all want to go, too.

And, Stu, consider the fact that we do have some Pacific experience up here, in case that's needed.

Roger. Copy. (Laughter.)

I'll tell you one thing, I don't want to set in that part of the Pacific.

Hey, Stu, as far as the temperature is concerned, they might bring along some - On the recovery, they might bring along some fuzzy knickers. Ours are pretty thin up here.

All right. Copy that, Rusty.

Apollo 9, Houston. We've still got about 2 minutes in this nice, long pass. We'll be uplinking a state vector once we get you in Texas acquisition. I've got a NAV check. You can either copy it now, or there.
08 19 27 37  CDR  on, we got a piece of paper here. Stu.
08 19 27 40  CC  Okay. Reading the NAV check: 212 40 00, minus 3282, plus 11997 2127.
08 19 28 05  LMP  Okay. 212 40 00, minus 3282, plus 11997 2127.
08 19 28 15  CC  That's affirmative.
08 19 28 35  CC  And, Apollo 9, Houston.
08 19 28 38  CDR  Roger. Go.
08 19 28 39  CC  And, Roger. I guess just to close the loop on this discussion here, we'll have ship at 152.1, if and when you come down there, so I just thought I might toss that in in case you're wanting it.
08 19 28 53  LMP  Yes, will it have the 350-pound cake on it?
08 19 28 56  CC  Yes, it will have a 350-pound cake on it; at least that's the word I have.
08 19 29 01  LMP  Okay. Great!
08 19 29 02  CC  And we'll lose you here in about 10 seconds, and have you through Texas around 40.
08 19 29 08  CDR  Roger. Did you say you've got the state vector in?
08 19 29 11  CC  Oh, negative. I said we're going to uplink the state vector at Texas acquisition, and I've just given you the NAV check now.
08 19 29 20  CDR  Okay. Thank you.
08 19 29 22  CC  Roger.

TEXAS (REV 133)

08 19 43 08  CC  Apollo 9, Houston through Texas.
08 19 43 11  LMP  Roger, Houston.
08 19 43 14  CC  And if you'll give us POO in ACCEPT, we'll uplink your state vector, and I'd like to ask you a question about P32.
Okay, Dave. What we're thinking of here is on this uplink into the CSM slot and leaving the vector as is in the LM slot and then prior to P22 shove the vector from the LM into the CSM and doing a P22 on it to see how it can bring in the state vector rather than starting the P22 with a good vector.

Okay. I think that's probably a pretty good idea.

By Jove! I got one up, then; okay. So this vector we're uplinking now, we'll not VERB 66 it; it will be in the CSM slot.

Are you still with us, Stu?

Roger. We got you through Texas here, now. This will be a nice long pass.

Okay. You just faded. I guess then what we want to do just prior to P22, is do a VERB 47.

That's affirmative. VERB 47 back over into the CSM slot, and then let's see how the P22 does. Then we'll give you a good vector in both slots after the end of it.

Sounds like a fine idea. How did those work out yesterday that I ran?

You're fading way out on me, Dave.

I say, how did it work out yesterday?

Okay. We're breaking up here, too.

I say again, how did the state vector updates work out yesterday?

Okay. I don't really have that info, Dave. I wasn't here and I haven't talked to anybody that's got a good handle on how they went. I read through the transcripts and it looked like it went well. But, I can't answer your question specifically. We'll get an answer for you, though.

Oh, don't worry about it. I was just curious. We can pick it up postflight. So sweet.
Okay. And, Apollo 9, we are through with the uplink, and we have not transferred it to the LM slot. The computer is yours.

Roger. Thank you.
08 19 55 46  CC  Apollo 9, Houston.
08 19 55 50  CMP  Go, Houston.
08 19 55 55  CC  Okay. Just to clarify this, I will have the exact times for you later. But talking of this ESP II update, here - We'll - When you do this VHB 7, we'll have that over a site somewhere, so as soon as you do that we will then uplink a good vector into the DM plot. That way we won't leave you at any time without a good vector.
08 19 56 20  CMP  You don't think we can get our vector update properly, with ??? Come on
08 19 56 25  CDR  Listen, I'm with you. Start updating us a good one.
08 19 56 29  CC  Well now, Dave, it's just your question there - Like we believe you can use that ESP, but we'll still send your block data.
08 19 56 38  CMP  Oh, I was just kidding you. I'll tell you what, we'll have a contest to see whose state vector is the best after F37. Okay?
08 19 56 46  CC  Hey, I think that's a good lick.
08 19 56 51  CMP  I think I know who will win.
08 19 57 28  CC  And, Apollo 9, I have about three more targets here, we'd like photographed. One of them is coming up in about 7 or 8 minutes. If you can't make it, why no sweat.
08 19 57 38  CDR  Go ahead.
08 19 57 40  CC  Okay. The first one: 212 plus 04 plus 16, four frames, 7-second intervals, zero degrees. This is of Morroco for geology.
08 19 58 01  CC  Did you get that, it sounded to me like I faded out.
08 19 58 07  CDR  Say again.
08 19 58 10  CC  Roger. Did you get the first update? It sounded to me like I faded out on you.
08 19 58 17  CDR  No; we've got it.

AOL9 AIRC - GROUND TRANSCRIPTION

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CANARY (REV 134)
Oh, okay. The second one is geology—well the time, 08 19 56, four frames, 6-second exposure intervals, zero degrees. And those are the old Tibesti Mountains here in Chad, and you are going to come over them this time.

Okay.

And the third one is 08 20 07 44, four pictures, 19-second interval, zero degrees. And this is with Ethiopia, Rif Valley—study on the geology there. And the last one is 08 20 20 35 55, four pictures, 5-second intervals, zero degrees, and this is geology and this is of Somaliland.

And that's all the updates I have now.

Okay. Thank you.

Roger.

Apollo 9, Houston. If you read, we'll see you over Carnarvon at 34.

Carnarvon (Rev 134)

Apollo 9, Houston through Carnarvon.

Good morning ...

Roger.

How are they making out on the recovery position decision?

Okay, they're still working on it, Jim. As far as I can tell, I don't see there's much decision to be made. Just really concentrating on the RCS backup on a couple of revs later is the big planning right now.

Okay. Well that's kind of the way we felt too. There didn't seem to be much choice between those two sites.

Hey, is that going to be down at 52 17...
08 20 36 41 CC I cut you out there. I think you're asking about the ship, and I thought that in a little bit the GO-YES, the Guadalcanal should make - 152 1 is the latest word I have here.

08 20 36 53 CMP Okay. Very good.

08 20 37 11 CC On that ship, might be - That's just some hasty info, Jim. We'll have a good word for you just as soon as we can and the final decision has been made. But I guess it's touch and go and whether or not the ship actually gets there.

08 20 37 28 CDR Okay. If none get to us maybe we can fly to it.

08 20 37 32 CC Roger.

08 20 37 36 CMP We need that cake.

08 20 37 40 CC Roger on the cake.

08 20 37 50 CC And we're having a time down here on this P22 bit about the state vector. Had a little change of plans. Rather than do as we suggested before, I guess I didn't realize the IM vector would be quite so far out, but we're going to have you do your P22 on the vectors you're carrying now. By then it will have degraded enough the mark should take effect, and also, the first cut at it is, we're going to have to change the waiting in this. Right now I don't believe the W matrix will take the P22 update. But we'll zap - We'll give you some numbers. MIT is working this out. They're real anxious to try this, too.

08 20 38 41 CMP Okay. Very good. We'll go into whatever you like.

08 20 38 45 CC Okay.

08 20 39 01 CC Okay. Jim, I just got the word here. There's no doubt about the ship being at 152 1.

08 20 39 10 CDR Okay. Very good. Have them bring all the good weather they can with it.

08 20 39 15 CC All right, or leave all the bad weather where it is, I guess would be the best way.

08 20 39 22 CMP Yes, that's even better. Have those guys been milling around out in those big heavy seas all of this time?
Yes; they sure have. Just a second here and I'll give you some info. That temperature - air temperature and water I got from you a while ago was from the Guadalcanal and I say it's 1000 °F, and at that time the waves were 4 feet, the swells were 14 feet, and the ceiling was 2600 feet, visibility 7 miles. Wind blowing 26 knots.

Wow! I don't think anybody up here is good enough sailor for that.

Roger. And I believe everybody here agrees with that.

But good.

And, Apollo 9, Houston. Would you bring up your S-band volume for honeysuckle, please?

Roger.

And, Apollo 9, Houston. Anticipate a caution and warning on your H₂ pressure.

Roger, Houston. Pressure one on the H₂.

Apollo 9, Houston. I have two more targets for you.

Roger, Houston. Just a minute.

Roger.

Okay. Go ahead, Stu.

Okay. Time, 213 plus 23 plus 54; three pictures; 20-second interval; shooting 45 degrees north. This is along the Georgia coast, and it's for weather. The next one is 213 plus 27 plus 33, three pictures, 20-second interval, 30 degrees south. This is of the Bermuda area, oceanography.
Okay. We got a bunch of MASTER ALARMS here in the middle of that first one on the cryo PRESS. Stu. Would you let me give you what I got and you can fill in on the rest. I got 213 23 54, three pictures, 20-second intervals of the Georgia coast, weather. I think you said north or south, but I'm not sure.

Roger. It's 45 degrees north.

Okay. 45 degrees north. And then another at 213 27 35, three pictures, 20-second intervals, 30 degrees south, Bermuda, oceanography.

Roger. I guess you had the right cut there when we were talking about the Georgia coast when you said south, I guess I should have said pardon the expression when I said 45 degrees north, there.

Stu, right after you said you guess I had the right cut there, you cut out.

Okay. Hey, we'll see you Mercury at 47.

Roger.

**HUNTSVILLE (REV 134)**

Disregard that. We'll be picking up the Mercury real soon.

And, Apollo 9, delay that fool time I gave you there, we've got you through the Huntsville now.

**MERCURY (REV 134)**

And, Apollo 9, this is Houston through Mercury. Standing by. Have you about 9 minutes.

Roger, Houston.

Hello, Houston, Apollo 9. Do you read?
05 20 59 33 CC That's affirmative, Apollo 9. We'll have you through Mercury another 5 minutes.

05 20 59 37 CMP Okay.

05 20 59 43 CMP Just in case my kids are listening, tell them I'm growing a big beard for them.

05 20 59 CC Okay. By Jove!

05 20 59 58 CC Seems like you ought to bring that back so they could see it.

06 21 00 04 CMP Seems that way, doesn't it?

06 21 00 05 LMP If you think you hear a lot of data down there, can you right up here.

06 21 00 10 CC (Laughter)

06 21 00 24 CC And, we just got another weather forecast in here, and it's just about the same. 1021 is looking a little better. In fact the height of the swell is going down. Winds light and variable, and scattered clouds, 10 miles VIS, 2- to 3-foot waves.

06 21 00 45 CDR That's not bad.

06 21 00 48 LMP Get the swell going down.

06 21 00 53 CC Yes. Well, in the last several hours they've gone from 6 to 5 to 6, so they're going in the right direction.

06 21 01 03 CDR That's nice.

06 21 01 09 CDR Who do we have out there measuring them?

06 21 01 15 CC Well, I don't know if we've got anybody specifically on that site yet or not, Jim.

06 21 01 23 CDR Okay. I thought maybe we had one of the destroyers down there.

06 21 01 27 CC Say again, Jim.
I thought maybe we had a destroyer down there.

We've got a bunch of ships out in there. Let me find out if the closest point they're getting their data from there.

And along with that weather forecast, the 151 looked just the same. No change in it; it's still looking pretty grim. It will pretty well determine how the decision is going.

Okay.

And we're about 103 Mercury. We'll see you Redstone in about 4 minutes.

All right Houston. We'll be here waiting for you. Waiting for those golden tones.

Okay, fine.

Hey, speaking of golden tones, where is old golden throat these days?

I haven't seen old golden throat since I lost myself in this hole over here.

Alrighty.

See you, Houston.

Apollo 9, Houston through Redstone. How do you read?

Loud and clear. Go ahead.

Roger. I just wanted to tag up on the weather info. We don't have a specific ship on 151. Guadalcanal is probably heading that way shortly, but it just comes from other ships all in the area, that's radioed into Miami. I'm having a looksee how close a ship they have got to that area.
Okay. I just thought maybe we had one of our destroyers down there, just sitting there with baited breath waiting for us, but if not, thank you.

Roger.

You don't have to press on any farther with it, Stu.

Okay. Just for your info, the Guadalcanal is 16 hours from 15°1. It's also 18 hours 15°1. It's been covering the 137 dash 1 recovery area, so it's 16 hours out of 152°1, plenty of time to be there.

Okay, fine.

And Dave...

... running around in circles.

Roger.

Okay.

And Dave asked a question about the tracking yesterday. The only thing that we checked in with MIT - The only thing they say is the tracking went well. They are going to take a while to analyze the data and so forth.

Okay. No problem, I was just a little curious.

Roger. Understand. That is about all I can tell you now.

Okay. Well, we will see if we can't do it right again today.

Today, with this procedure, you will be able to get a first hack at it - see how it goes.

Yes. It'll be very interesting.

And I have the procedure that you will use to put in your factors in your Wheaton and I could give you those any time.

Okay. Can you stand by just one?
Roger. Lots of time; I just thought if you wanted to take them now or anytime later.

Houston, Apollo 9.

Roger. Okay. Go ahead with your procedures for the 230, I'll be ready to copy.

Okay. Before and after you do Pd2, do a VERB 83 so we can get comparisons before and after.

Okay.

Roger. Now we're going to load into the W matrix, and what the optical loads will do for you is give you a 10,000 foot and 10 feet per second. And this is what we want is a VERB 83. NOUN 91 ENTER, 2004 ENTER, 137 ENTER, 762 ENTER.

Okay. Understand set the W matrix at 10,000 and 10, with a VERB 24, NOUN 91 ENTER, 2004 ENTER, 137 ENTER, and 762 ENTER.

Roger.

And a VERB 83 before and after.

Roger. We'll get the VERB 83 before and after.

Okay. Have fun.

Okay. We will also reset that 121 alarm and then set it afterwards. Okay?

Yes, real good. And you still have the procedure you used yesterday, Dan?

Yes; I've got it. Thank you.

Okay.

Houston, Apollo 9.

Okay. Go ahead, Apollo 9.
Hey, on the night pass before the landmark tracking, after we get through with the COS calibration, how about another P22 to RESIZE to get the platform all tweaked up? Okay?

Roger. That sounds real good.

Okay.

And, Apollo 9, Houston, you have a GO all the way to 152 dash 1.

Roger: GO to 152 dash 1. Very good.

Apollo 9, Houston.

Houston, 9. Go.

Okay, Dave. I just want to verify there again that we will do the P22 to the CSW vector that you have now, and that VERB 47 we will not do prior to P22.

Roger. We understand that.

Okay.

You want us to do mode 66 now, or you just want to leave the other one in there?

We are going to uplink you a good one before we start. I guess that's probably your choice.

Just a second; let's see what Guidance has to say about that.

Okay, Apollo 9. Guidance said the same thing I did: your choice.

Okay.
Apollo 9, Houston. 

Houston, 9; go.

Roger. We have made it official now. It will be 152 dash 1, and the time for ignition on my Mark will be 27 hours and 4 minutes.

MARK.

Okay. We got that.

Okay.

Looks like it's 240 30 09.

Well, that's pretty close. It's really 06.

By George! I knew we'd miss something.

You did good work.

CARNARVON (REV 135)

Apollo 9, Houston.

Roger, Houston. Go ahead.

Roger. We're showing quad Charlie is approaching the switchover point there, and if it switches over, we would like you to go back and use BD roll and disable AC roll. Over.

Okay. We'll keep an eye on it. We will go to BD roll, and you still want us to use the BC quads, right?

That is affirmative.

Okay.

CARNARVON (REV 135)

Apollo 9, Houston through Carnarvon. And I have an S065 PAD for you.
08 22 10 19  CF  Roger.  Stand by by just one.
08 22 10 22  CC  Roger.
08 22 10 24  CF  Houston, Apollo 9.
08 22 10 26  CC  Houston. Go.
08 22 0 28  CF  Roger. We tried taking a couple of photographs through the sextant here, and we took five of them. I don't know how they are going to come out, but we just thought we'd advise you.
08 22 10 38  CC  Okay. Real good.
08 22 11 04  CF  Okay, Houston. Go ahead with the 5065 PAD.
08 22 11 07  CC  Okay. Inertial angles, 18000 26200; yaw, all zips; 214 55 20; 216 10 00. You'll be ORB RATE and your Victor through Zulu are the same as yesterday. First sight is Wilmington at 0315 00 26 20 03. Over.
08 22 12 04  CF  Roger. 18000 26200 all zips 214 55 26 216 10 00; ORB RATE: Wilmington, 215 00 26 20 03.
08 22 12 25  CC  Roger. Your readback is correct.
08 22 13 23  CC  And, Apollo 9, Houston. I have about seven targets of opportunity here. That'll take care of it for the day, I think.
08 22 13 31  CF  Okay. Just a minute.
08 22 14 28  CF  Okay, Houston. Go ahead and give us the time first.
08 22 14 30  CC  Roger. 214 51 30, seven frames, 26 seconds, on track; it's Mexico, geology. At time 214 54 46, three frames, 24 seconds, it's north 60 degrees, Rocky Mountains, geology. At time 214 56 17, three frames, 22-second interval, south 30 degrees, College Station, Texas, weather. At time 215 23 05, four frames, 26 seconds, north 45 degrees, Gulf of Guinea, weather. At time 216 31 06, four frames, 8 seconds, on track, high plains, Louisiana, Texas, geology. At time 216 43 26, 10 frames, 20 seconds, on track, that's Eosta, weather. At time 217 02 12, nine frames, 20 seconds, north 60 degrees, Cape Fria, southwest Africa, weather. And that ought to do it for the day.
Okay. Just a minute.

And we'll have S-band volume up at 19.

Roger. S-band up at 19.

Okay. Time 214 51 30, seven frames, 26 seconds, on track, Mexico, geology. 214 54 56, three frames, 24 seconds, north 60 degrees, Rocky Mountains, geology. 214 56 17, three frames, 22 seconds, south 30 degrees, College Station, weather. 215 21 05, four frames, 20 seconds, north 45 degrees, Gulf of Guinea, weather. 216 31 06, four frames, 8 seconds, on track, Lubbock, geology. And 216 43 06, 18 frames, 20 seconds, I've got BOMEX, weather. 217 02 12, nine frames, 20 seconds, north 60 degrees, Cape somebody or the other, and weather.

Roger. And that BOMEX weather is on track.

Okay.

And that's Cape Fria, F-r-i-a, in Africa.

Okay. Fine.

Apollo 9, Houston. One minute LOS; Hawaii 39.

Apollo 9, Houston through Hawaii.

Roger. This is Apollo 9. Go.

Roger. We'll have you now all the way up until about 10 minutes after the hour.

Ch; very good.
Apollo 9, Houston, Apollo 9.

Apollo 9, Houston. Go.

Roger. Could you brief me on what we are going to do with the SO65 on the next pass?

Roger. Stand by one.

Apollo 9, Houston.

Go ahead. Houston, 9.

Okay. On the SO65, there will be taken some about seven pictures over the U.S., about 50 of them over the ECMX area, and then we will pitch up and empty the cameras on the horizon. We will pass up the angles and this good deal stuff up to you.

Very well.

Okay. Very good. I was very afraid you might have some film left.

No, we are going to use it all. As a matter of fact, we will run up before we pitch up, I think, on one of the cameras, but we will just use the other cameras on the - out on the horizon.

Okay. Very good.

Apollo 9, Houston through Carnarvon.

Go ahead. Houston, Apollo 9.

Roger. We'd like to get a little more information on quad Delta switchover; so if you could, use quads Charlie Delta for attitude control, right Bravo Charlie.

Okay. You want us to go with Charlie Delta now?

Affirmative. Charlie Delta for attitude control, continue with Bravo Delta roll.
Tape 138/2
Page 790

08 23 48 52 LMP Okay; check. Here it is: Baker Delta for roll.

08 23 45 56 CF Roger. Baker Delta for roll when you switch over.

08 23 49 03 LMP Wait a second, now. Do you want me to stay in Bravo Charlie now or do you want me to go to Charlie Delta now?

08 23 49 13 CC Roger. We'd like to go to Charlie Delta now for attitude control, and then when you switch over, go to 70 for roll.

08 23 49 20 LMP Okay.

08 23 51 31 CC Apollo 9, Houston. I have two 8065 updates for you.

08 23 51 36 CMP Okay. Stand by just one.

08 23 51 45 CMP Okay. Go.

08 23 51 46 CC Roger. 180 00 274.70, all zips, 216 23 00, 216 10 00. It'll be ORB RATE. First site: southwest U.S., 216 27 15 20 15. Second site: Georgia, 216 34 40 20 07. Third site: ROMEX, 216 40 43 20 33.

08 23 53 12 LMP Houston, are you there?

08 23 53 14 CC Roger. Go.

08 23 53 16 LMP Okay. Ready for readback?

08 23 53 19 CC Affirmative.

08 23 53 21 LMP Okay. 180 00 274.70, all zips, 216 23 00, 216 10 00, ORB RATE; southwest U.S., 216 27 15 20 15; Georgia, 216 34 40 20 07; ROMEX, 216 40 43 20 33.

08 23 54 00 CC Roger, Houston. Let's verify your pitch inertial angle, 274.70.

08 23 54 08 CMP Roger. 274.70.

08 23 54 12 CC Okay. And now for this deplate in the film, there. What we want are some pictures of the horizon to see if we can get these different shades of blue that were observed in the Gemini program, and I'll give you some ORB RAPP angles. I guess
as soon as you finish up the last so65, just
whip around in the ORB RATE ball at these angles.
I'll give you the time, then you can deplete the
film as soon as you get to the attitude.

Okay. Go.

Okay. Your ORB RATE ball angles will be 180
27 - belay that. Fitch will be 25.7; yaw, zero.
Your time will be 217 03 00. And S-tend volume
up for Honeysuckle.

Okay. You want me to read it back?

Your site there will just be the horizon. Deplete
film and 10-second intervals.

Okay. Ready, Houston?

Affirmative. Go.

Okay. For the film depletion we use orbit rate
angles, pitch or roll will be 180.0, pitch 025.7,
and yaw 000. The time will be ... 7 03 00. We
put the cameras on horizon, take pictures at 10-
second intervals until the film is all gone.

Roger. And Jim, we're kind of short there. You'll
probably be going into darkness right away, so as
soon as you get the attitude just go ahead and
start taking the pictures.

Okay. We'll zip right up there.

And I can give you some inertial angles if you
want to check your ORB RATE and things.


Roger. Inertial angles will be 180 00, 169 70,
and yaw, zero.

Apollo 9, Houston. I think we have good two-way
lock, now.

Okay, Ron. I get the 180 but I didn't get the
pitch.
Okay. The pitch will be 169 70 and yaw, zero.

Okay. The inertial angles are 180.0, 169.7, and 00000.

Roger. And those inertial angles will be good at 217 03 00.

Okay.

Apollo 9, Houston. Approaching LOS. Possibility, no voice Honeysuckle 01; if not, Hawaii at 13.

Okay. Understand you might get us at Honeysuckle and you may not, and Hawaii at 13.

Roger.

Houston, Apollo 9. What's the last gyro torquing angle?

Apollo 9, Houston. Say again.

Apollo 9, Houston through Huntsville.

Apollo 9, Houston through Huntsville.

Apollo 9, Houston.

Apollo 9, this is Huntsville. Over.

Hello there, Huntsville. This is Apollo 9. How are you today?

Just fine, Apollo 9. Our HF link to Houston is out at this time. Can I take any message for them to relay until we get back in?

I don't believe so. Tell them we're preparing to do S065, and everything else is okay.

Roger. Huntsville.

Huntsville, how are you doing down there?

Apollo 9, Huntsville. We're doing fine now, other than our CSM is bad here to HF link.
We certainly appreciate all the help you guys have given us during the flight.

Roger. Thank you.

Okay. Get some of that good sun for us, will you?

Roger. That we have down here pretty close to the equator. It's pretty warm.

Yes, I know. I wish we had some of it up here.

You should be closer to it.

I hadn't thought about it that way.

Apollo 9, Houston.

Go ahead, Houston. Apollo 9.

Roger. I'll take your torqueing angles now if you want to.

Roger. Stand by.

Okay. GET: 215 40 00, plus 00134, minus 00017, minus 00105.

Apollo 9, Houston. Roger. We copy.

Okay.

And I think I left you with the idea that the depletion on that S065 was pointed right at the horizon. Actually, the camera should be pointed 15 degrees below the horizon.

Okay.
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

HAWAII (REX 136)

09 00 30 41 CC Apollo 9, Houston.
09 00 30 44 CMP Roger. Go.
09 00 30 45 CC Roger. We had a little problem there in semantics with the scientists. Your ORB RATE pitch angle for the depletion thing is really 040.7. The cameras are pointing at the horizon, and your inertial pitch angle will be 184.7.
09 00 31 19 CMP Roger. ORB RATE, 040.7; inertial, 184.7.
09 00 31 24 CC Roger.
09 00 31 27 CMP Okay.

TFAAS (REX 137)

09 00 43 20 CC Apollo 9, Houston. One minute LOS; Ascension at 51.
09 00 43 25 LMP Roger. Okay, Houston. We are busy snapping pictures for you.
09 00 43 29 CC Real good.
09 00 43 31 LMP The States were really clear that time; we ought to really have some nice ones.
09 00 43 35 CC Hey, that's what we like to hear.
09 00 43 39 LMP Trouble is we're supposed to be taking pictures of the weather out here and the ocean is clear as a bell.
09 00 43 45 CC Well, oceanographers will be happy, then.
09 00 43 49 LMP Yes, just as long as we have the cameras pointing down, we're pleasing somebody.
09 00 43 55 CC Okay.
ASCENSION (REV 137)

09 00 52 14 CC Apollo 9, Houston through Ascension. Standing by.
09 00 52 19 CDR Roger.
09 00 52 20 CC Roger. Loud and clear. — —
09 00 52 25 CDR Excuse me, I'll cut you out. Say again.
09 00 52 28 CC That's all right. You're pitching up but we got it.
09 00 52 31 CDR Okay.
09 00 54 30 CC Apollo 9, Houston.
09 00 54 34 CMP Go ahead.
09 00 54 35 CC Roger. It looks like we are going to get a pretty good tracking target on the ascent stage this evening. It's the closest point of approach will be 222 hours and about 41 minutes. It's about an hour into your rest period there, but we plan to let you sleep an hour in the morning and kind of wonder what you thought about this.

09 00 54 59 CDR Sure. We'd like to track it.
09 00 55 01 CC Okay. Real good. It looks like we'll go ahead and work it into the flight plan there and update you a couple of state vectors — both the CM and the LM. Range will be out about 690 miles, and we'll give you some gimbal angles to point the optics out of. We'll take a few marks, and then we'll make a vector compare on it.

09 00 55 23 CDR Great.
09 00 55 25 CMP Very good.
09 00 55 32 CC And we are tracking the ascent stage by a C-band radar and skin track, so that's where we are getting our vector.
09 00 55 41 CDR Okay. How did that ascent stage hold up after we got out of it?
09 00 55 46 CC Beautiful. The Commander's bus went down in about 7 hours, I think.
09 00 56 12 CC Oh, by the way, the lighting looks like it's going to be about perfect for this tracking thing, too.

09 00 56 18 CDR Okay.

09 00 58 00 CC Apollo 9, Houston.

09 00 58 04 CDR Go ahead.

09 00 58 06 CC No. It looks like - When you finish your landmark tracking there, what we plan to do is set you up in a PTC mode, and we'll update the stuff for you here later on. But just keep it in the PTV mode, then you can go ahead and get kind of squarer down there. We'll stay in PTC until we start on the tracking of the LM.

09 00 58 27 CDR Okay. We can also set ourselves up in 30- to 40-degree deadband hold to keep it out of pimbal lock, and that's what you want.

09 00 58 35 CC No. We really want the data on the PTC with the DAP driving it so we can get an idea on the fuel and pressure operations, and what have you.

09 00 58 46 CDR Okay. What kind of pitch and yaw deadband are you looking for?

09 00 58 51 CC Roger. It'll be 20 degrees.

09 00 59 06 CC I think so, but we will get you over Yarramah; if not there, Carnarvon.

09 00 59 14 CDR Okay. How about checking into that, will you, please?

09 00 59 16 CC Okay.

CARNARVON (KEY 139)

09 01 22 09 CC Apollo 9, Houston. Through Carnarvon, I have a landmark tracking update.

09 01 22 16 CDF Okay, Houston. We'll be ready for the landmark tracking in a minute. But before you send us that data, he advised that we went into the darkness taking a picture of the dark horizon rather than the sunlit horizon; our plan is to continue around and finish up the next morning, if we can...
sunrise, if that's okay with you. Now, go ahead with your update.

Okay. That's fine with us.

And we're ready to copy the update.

Okay, update follows. Landmark ID: 005 217 59 15 00; or, now to TCA time, 218 03 13 00; north 30 miles. Next one: ID, 065 218 10 28 00; TCA time, 218 14 05 01; and it's north 30 miles.

Okay. 005 217 59 15 00, 218 03 13 00, 10 miles north; 065 218 10 28 00, 218 14 05 01, north 30 miles.

Apollo 9, Houston. Your readback correct.

Apollo 9, Houston. Can you give us POO in ACCEPT there shortly for a state vector uplink?

Roger. As soon as we torque these angles - You can probably copy them down now.

Roger. We have them.

Okay. We'll be torqueing at 217 25 30.

Houston, 9.

Apollo 9, Houston. Go.

Did you want the numbers from the COAS calibration now, or do you just want them recorded for later?

If you have them, then go ahead and get them.

Okay. I can give you - You've got POO in ACCEPT now, by the way.

Roger.

I can give you the ones I did on the rendezvous day, and then I did two today for repeatability, if you want to copy them down.

Roger. Go.
Okay. The first one was on day 5: 35974 57167.

Roger. Copy.

Okay. And here are the two for today: 35981 57239, 35977 57296.

Roger. We copy.

Okay.

Apollo 9, Houston.

Go ahead, Houston.

Roger. If you can get it in there prior to P22, we'd like you to do a VSB 85 and copy down i, n, dot, and theta, and then also hit a VSB 83 after you've completed P22.

Okay.

Houston, Apollo 9.

Go.

One other question: when you get around to having us track the ascent stage, are you going to do anything on the dummy matrix?

Roger. Stand by.

Apollo 9, Houston.

Houston, 9. Go.

Roger. The computer is yours. You have a good state vector on the LM slot and a deteriorated one in the CSM slot.

Okay. We'll plan to use the CSM slot for the updating on landmark tracking, and then we'll take a look after that.

Roger. And we're still gaining up the procedure, then we'll check the thing. We'll let you know on the k-matrix.

Okay; very well.

Apollo 9, Houston. We'll see you at Guam at 36.
HAWAII (SEV 138)

09 01 49 31 CC Apollo 9, Houston. Standing by through Hawaii.

09 01 50 35 CDR Roger. Houston, Apollo 9. We are coming around to tracking attitude. And be advised we took some pictures of the sunrise. We only had two cameras running when we started and one ran out after about three or four frames, so we finished up with the other camera.

09 01 50 52 CC Roger.

09 01 53 52 CC Apollo 9, Houston. Check your gimbal there.

09 01 53 56 CDR Roger. Houston, Apollo 9. Thank you.

09 01 55 14 CC Apollo 9, Houston. Just a little reminder on that W-matrix update.

09 01 55 21 CDR Go ahead with your reminder.

09 01 55 24 CC Okay. To update the W-matrix, change it to 10 000 feet and 10 feet per second; that we talked over this morning.

09 01 55 35 CDR Roger. That's in work.

09 01 55 37 CC Okay. Good.

FND OF TAPE
Apollo: AIR-TO-GROUND VOICE TRANSCRIPTION

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Mission (REV 133)

09 02 05 36 CMP Houston, Apollo 9.
09 02 05 39 CC Apollo 9. Houston. Go.
09 02 05 41 CMP Roger. There's a little low deck of clouds over the first landmark, so we will have to try another one.
09 02 05 48 CC Okay. Can't get them all, I guess.
09 02 05 52 CMP Everything else looks pretty good inland, but there's a little low deck of stratus out there.
09 02 05 57 CC Roger. Understood.

Antigua (REV 136)

09 02 17 42 CC Apollo 9, Houston. About 2 minutes LOS, and I have your PTC procedures, and I will give them as flight plan updates.
09 02 18 15 LMP Okay. Ready to copy your PTC updates.
09 02 18 19 CC Roger. Perform CMP, page 3 dash 17, 4 plus 0.1 degrees per second. Your initial attitude: roll, zero; pitch, 231.7; yaw, zero.
09 02 18 52 LMP Okay. Is that it, Ron?
09 02 18 53 CC Negative. Do step seven at 216 plus 35 plus 00; at 216 plus 40 plus 00, change DAP deadband to plus or minus 10 degrees. I think you have that procedure on page about 327, your CMP checklist.
09 02 19 31 CMP Right.
09 02 19 39 CM Any other questions?
09 02 19 41 CC Roger. Just about every REV thereafter we are going to want to try a different deadband. We will try to get 30 degrees, and then 25 degrees. We will give you a call on those.
09 02 19 48 CMP Okay. Understand to perform - The procedure then is to perform CMP 317 for plus 0.1 degrees per second, initial attitude, 0. 231.7, 0. Do
step 7 at 218 35 00; and 218 40 00, change the
DAP deadband to plus or minus 10 degrees.

Affirmative. And you will be kind of on your
own. Now you can do any housekeeping things
you want to do and we will update you for the
tracking procedure here a little later on.

Roger. Stand by for some ... where we're going
to put all this stuff.

ASCENSION (REV 138)

Apollo 9, Houston, Ascension. Standing by.

Roger.

Roger. Loud and clear.

Hey, Houston, 9.

Apollo 9. Go.

Hey, I guess that data isn't going to be much
good to you on landmark tracking; there were
clouds down there and I marked at a wrong target.

That ought to give us a pretty good error, any-
how.

Yes, it ought to really give you a good error.

Okay.

T ook a stratus back there - and the prime one -
There was one that looked like the prime one,
and just missed it.

You may have to break the spacelight, I guess.

Yes, I can give you latitude and longitude of
a good one.

Okay. Let's use that one.

Okay. Stand by.

Is this the one you tracked?
Roger. Stand by and I'll give you latitude and longitude; maybe you can put it together.

Okay. That'll help us.

Apollo 9, Houston. Thirty seconds LOS; Tannarive 44; if not there, Carnarvon 59.

Roger. Tannarive 44, Carnarvon 59.

Apollo 9, Houston. Carnarvon standing by.

Roger. Houston, Apollo 9.

Roger. Good and clear, Jim.

Houston, 9.

Apollo 9, Houston. Go.

Okay. Let me give you the latitude and longitude of the point that we marked on our last pass and maybe you can make some good out of the data you got. Okay?

Hey, very fine; we can use it.

Okay. I'm sure you can figure out what the point is when I give you the numbers. Its latitude is 19.815, longitude is 73.416.

Roger. 19.815 and .416.

Roger. And it's on the western tip of Haiti, there.

Roger.

And, surprisingly enough, the 0689 numbers that came up out of the computer were pretty close.

Well - amazing! Real good. Thank you.

Yes, sort of like it identified an unknown landmark and then made it known, and figured out where it was; it did a pretty good job.
Apollo 9, Houston through Guam.
Roger, Houston.
Roger, Dave. Your best admirer and two little ones are watching you whip across the world here, now.
Say again.
I say your best admirer and two little ones are watching you whip across the world.
Oh, very good. Say hello to them for me.
You're saying it.
As a matter of fact, tell them I'll be there for chow in a couple of days.
She's nodding.
Houston, Apollo 9.
Apollo 9, Houston. Go.
For your information, right now we are demonstrating how to take out and remove the center couch at zero g in order to fill, I guess, one of the last DTO's.
Real fine. Any problems at all with it?
Oh, no; it's real easy. As a matter of fact, it's easier than it is down there.
That's what we were hoping.
We'll have some movies if Cecil B. Marchal and this other fellow here can come out with the right production scenes.
Mighty fine.
What we really need are a couple of good editors.
That's for sure, probably.
9, Houston. MCC is looking real good so far. We'll see what happens when you come up perigee here.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 03 16 46</td>
<td>CMP</td>
<td>Okay. Let us know when you want us to change headbands.</td>
</tr>
<tr>
<td>09 03 16 49</td>
<td>CC</td>
<td>Will do.</td>
</tr>
<tr>
<td>09 03 20 00</td>
<td>CC</td>
<td>Apollo 9, Houston, Hawaii at 27.</td>
</tr>
<tr>
<td>09 03 30 05</td>
<td>CMP</td>
<td>Roger. Hawaii at 27.</td>
</tr>
</tbody>
</table>
Apollo 9, Houston. I can give you the times to change DAP deadbands now.

09 03 36 05 CC Apollo 9, Houston. I can give you the times to change DAP deadbands now.

09 03 36 16 CDR Okay again.

09 03 36 22 CDR Roger. I can give you the times to change your DAP deadband.

09 03 36 26 CC Okay. You're coming through clear, now. Go ahead.

09 03 36 42 CDR Roger. At 220 plus 10 plus 00, change DAP deadband to 20 degrees.

09 03 36 49 CC Roger. Understand. 220 10 00, DAP deadband to 20 degrees.

09 03 37 03 CDR Roger. 221 plus 00, change deadband to 25 degrees.

09 03 37 08 CC Roger.

TEXAS (REV 1.9)

09 03 40 22 CC Apollo 9, Houston. I'd like to talk a bit about your cryo plan for tonight.

09 03 40 30 CMP Okay. Go ahead.

09 03 40 32 CC Roger. It's the same as last night except your H2 tank pressure can go down to 180 to 200, and then we'll turn on tank 1 fans tonight.

09 03 40 53 CMP Okay. H2 tank pressure down to 180 or 200, and we'll turn on tank 1 fans tonight.

09 03 40 59 CC Roger. Otherwise, it's the same as last night.

09 03 41 03 CDR Okay. We'll give a report when we get everything done.

09 03 41 06 CC Okay.

09 03 46 10 CC Apollo 9, Houston. Generator is 21.
TANANARIVE (Rcv 139)

09 04 21 23 CC Apollo 9, Houston through Tananarive.

09 04 21 30 CC Apollo 9, Houston through Tananarive.

09 04 22 06 CDR Go ahead. Houston, Apollo 9.

09 04 22 08 CC Roger. Do you read well enough for a flight plan update?

09 04 22 12 CDR Roger. I believe so.

09 04 22 16 CC Roger. When you are ready.

09 04 22 29 CDR Go ahead, Houston.

09 04 22 32 CC Apollo 9, Houston. When you are ready, I will go with flight plan update.

09 04 22 39 CDR Roger, Houston. Go ahead with the flight plan update.

09 04 22 43 CC Roger. 220 plus 36, block data; 221 plus 05, update state vectors; 222 plus 25, maneuver to ascent stage track attitude; 222 plus 50, power down IMU and SAS, terminate BATT A charge, waste water dump to 35 percent. I say again, 35 percent. Begin rest period. Over.

09 04 24 23 LMP Okay. How do you read Apollo 9, Houston?

09 04 24 26 CC Roger. Pretty good now.

09 04 24 29 LMP We missed where you said 220 43. Would you say that one again, please?

09 04 24 36 CC I'll send you block data.

09 04 24 44 LMP Okay. 220 48, block data; 221 05, update state vectors; 222 25, maneuver to ascent stage track attitude; 222 50, power down IMU and SAS, terminate BATT A charge, waste water dump to 35 percent. Begin rest period. Over.

09 04 25 07 CC Roger. Your readback correct.

09 04 25 13 CDR Houston, Apollo 9. What's the get-up time in the morning?
09 04 25 17 CC Roger. Your normal time on the flight plan was 236 plus 30, and we are thinking of making it 233 plus 30 or 233 plus 50. That's about 7 1/2 hours prior to EORO.

09 04 25 43 LMP Roger. Understand it will be 233 35.

09 04 25 49 CC Affirmative.

09 04 49 41 CC Apollo 9, Houston through Guam.

09 04 49 47 CMP Houston, Apollo 9. Go.

09 04 49 49 CC Roger. I'll take your block date over Hawaii, here. I'd like to talk over the P20 procedures now if you want to copy.

09 04 49 58 CMP Roger. Let me get a pencil.

09 04 50 11 CMP Okay. Go ahead, Mon.

09 04 50 13 CC Okay. I'll give you the procedures - about six steps - and then I'll give you the dope on the ascent stage relative motion.

09 04 50 21 CMP Roger. Ready to copy.

09 04 50 29 CC Okay. The first step is roll spacecraft to blank angle; I'll get that to you in a minute. Second one: select normal P20 procedures with AUTO maneuvers starting CMP page 1 dash 1. Mark as long as desired in 1-minute intervals, and update 1M state vector. Time of closest approach, 222 plus 1 - that is, start again: 222 plus 11 plus 46. You can call P20 anytime prior to closest approach, but be careful of middle gimbal angle on VERB 50 MGN 10. If you call it too early, that middle gimbal angle may be greater than 50 degrees.

09 04 51 47 CMP Roger.

09 04 51 48 CC And your current keypad initialization is okay. Also, actually, you can call 1M on 12 plus 35 plus 30. Your range is about 1000 miles at that time.

09 04 52 15 CMP Okay.
Okay. Your initial roll angle will be 345.6.

Okay. You ready for readback?

Okay; go.

Okay. The roll angle for initial acquisition, 345.6, with an AUTO maneuver in P20 - normal P20. Mark at 1-minute intervals; time of closest approach, 24.1, 46; and P23 time prior to closest approach. We'll keep an eye on the middle gimbals angle. W-matrix is okay, and the range is 1000 miles at 222 ...

Apollo 9, Houston. Roger. Your readback is correct.

Okay. We'll give it a whirl.

Okay. I've got some more data here at your point of closest approach, on it.

Yes, I was just going to ask you how close and that sort of thing.

Okay. Do you read me now - still?

Roger. Go.

Okay. The range will be 652 nautical miles, R dot 32; CSM will be trailing 603 miles. You'll be below P72 miles, and you'll be 117 miles to the right.

Okay. Understand. Closest approach 652 miles, R dot equals 32 is what I heard; CSM trailing 603 miles, below P72, to the right 117.

Roger. Your LM RA is 3741.7 by 127.8.

Roger. 3741.7 by 127.8.

Hey, Ron, say again the R dot at closest approach.

Roger. R dot is 32 feet per second.

Okay. 32 feet per second.

It's a pretty slow pass through there, also. Looks like you'll have about 10 to 15 minutes of tracking there.
Okay. Say again what you said just before the 10 to 10 minutes of tracking.

It goes pretty slow across the field of view.

Okay. How it go right to left or left to right or what?

It will be going left to right.

Okay. Thank you.

HAWAII (BEV 135)

Apollo 9, Houston.

Roger, Houston. Stand by con.

Okay. We are ready to copy the block data.

I was afraid of that. I don't quite have it yet. Request POO in ACCEPT.

POO in ACCEPT we got.

Very well, and you won't quite have a Pegasus up there today. It's going to look like about a fourth magnitude star, we think, and my interpretation of the relative motion plot was wrong. The IM is going to be moving from your right to left, so the CSK will be yawing to the left.

Okay. Roger. Understand. Right to left and we'll be yawing to the left.

Affirmative.

Hey, when we get back we'll have to talk about one PCC and where we stopped it. We stopped it a couple of times now, and we'll get with you and get that all squared away. We have got the times.


9, Houston. I have a NAV check I can feed up to you. This is an LM NAV check.
HAWAII (REV 139)

09 05 05 26  CMP  Okay. Go ahead.
09 05 05 28  CC  Roger. Time: 222 00 00 00, plus 0252, plus 11936 0228. Over.
09 05 05 56  CMP  We understand. 222 00 00 00, plus 0252, plus 11936 and 0228.
09 05 06 10  CC  Roger. That is really at 3000, 22.8, but the LSKY doesn't have room for it - or the pad doesn't.
09 05 05 21  CMP  Okay.
09 05 07 23  CMP  Houston, Apollo 9.
09 05 07 24  CC  Apollo 9, Houston. Go.
09 05 07 26  CMP  Okay. There goes your uplink again. Your uplink was hung up there for a minute.
09 05 07 52  CC  Apollo 9, Houston. We've got a bit of in and out of keyhole there in Hawaii. If we don't quite get it, we'll finish it at Redstone. Redstone AOS it at 09.

REDDSTONE (REV 139)

09 05 10 34  CC  Apollo 9, Houston.
09 05 10 37  LMP  Roger, Houston. Go ahead.
09 05 10 39  CC  Roger. We had a couple of lines wrong there due to keyhole, so we'll line-by-line the CSM, then go straight up with the LM state vector.
09 05 10 48  LMF  Okay.

COLORSTONE (REV 110)

09 05 12 37  CC  Apollo 9, Houston. The computer is yours.
09 05 12 41  CDR  Okay. Thank you.
09 05 12 44 CC  Roger.
09 05 12 50 CC  9, Houston. How's your eyeball today?
09 05 12 55 C_MP  Oh, it's pretty good.
05 05 12 57 CC  Okay. Real well.
09 05 13 00 C_MP  We'll find that out about --
09 05 13 03 CC  We're counting on you.
09 05 13 07 C_MP  I hope.
09 05 13 09 CDR  Dave is telling me that maybe the tracking light is back on.
09 05 13 15 CC  Yes; Roger.

GUAYMAS (REV 1140)

09 05 13 23 CC  9, Houston. Super RETRO has checked and checked and we are ready for block 22.
09 05 13 34 CDR  Okay. Tell super RETRO to shoot.
09 05 13 37 CC  Roger. 141 Charlie Charlie, plus 174, minus 1620 223 57 43 2834; 142 Charlie Charlie, plus 078, minus 1690 225 32 55 2832; 143 Charlie Charlie, plus 209, plus 1450 227 01 06 3913; 144 Charlie Charlie, minus 250, minus 1620 223 51 33 5825; 145 Alfa Charlie, plus 038, minus 0320 229 13 07 5534; 146 Alfa Charlie, plus 198, minus 0301 230 29 47 4539; 147 2 Alfa, plus 293, minus 0350 232 26 14 3813. Your pitch trim, minus 0.64; yaw, minus 0.94.

09 05 16 36 LMP  Okay, Ron. What did we start with? 141 Charlie Charlie?
09 05 16 40 CC  Affirmative.
09 05 16 42 LMP  Okay. Plus 174, minus 1620 223 57 43 2834; 142 Charlie Charlie, plus 078, minus 1690 225 32 55 2832; 143 Charlie Charlie, plus 209, plus 1450 227 01 06 3913 --

09 05 17 12 CC  Faster.
09 05 17 16  SC  Are you still with us, Houston?
09 05 17 17  CC  Affirmative. Faster.
09 05 17 19  SC  Okay. Charlie Charlie, minus 298, minus 1620 228 51 08 5825; 145 Alfa Charlie, plus 038, minus 0320 729 13 07 5534; 146 Alfa Charlie, plus 198, minus 0331 230 49 07 5539; 147 2 Alfa, plus 293, minus 0340 232 26 16 3015. Pitch trim, minus 0.6; you, minus 0.94.
09 05 18 00  CC  Roger. Your readback is correct.
09 05 18 05  CC  9, Houston.

TANANARIVE (HFV 145)

09 05 58 57  CC  Apollo 9, Houston through Tananarive.
09 05 59 04  CDR  Hello there, Houston; how are you?
09 05 59 06  CC  Oh, Roger. Mighty fine. The White Team bids you Sayonara, and they will see you back at the ranch.
09 05 59 24  CDR  Very good.
09 05 59 34  CDR  Houston, do you read Apollo 9?
09 05 59 37  CC  Apollo 9, Houston. Loud and clear. How —?
09 05 59 42  CDR  We're reading you. I'd like to thank — We'd all like to thank the White Team for all their efforts.
09 05 59 48  CC  Roger. We appreciate it.
09 05 59 53  CDR  Tell that Flight Director that we still have that debriefing we've got to get with.
09 05 59 59  CC  Okay. He copied.
09 06 00 12  CDR  Hey, is the big white Director there?
09 06 00 16  CC  Say again.
09 06 00 20  CDR  Is that big white Flight Director there?
09 06 00 23  CC  Affirmative. He's on the loop.
Okay. Tell him we better have that debriefing.

We concur and we will schedule it accordingly.

Tally Ho!

Roger.
Apollo 9 AIR-TO-GROUND VOICE TRANSCRIPTION

HAWAII (REV 140)

09 06 40 11 CC Apollo 9, Houston.
09 06 40 15 CDR Go ahead, Houston. This is Apollo 9.
09 06 40 18 CC Roger. Just checking here with you. We'll be doing - asking for your E-memory dump here at about 51.
09 06 40 27 CDR Okay. We're tracking the LM right now and -
09 06 40 36 CC Okay. Understood. How's it going?
09 06 40 39 LMP Okay. We've got it.
09 06 40 41 SC Very good.
09 06 40 45 CC Lot of smiles around here.
09 06 40 49 CMP It's 40 46.
09 06 41 16 CC Apollo 9, Houston.
09 06 41 19 CDR Go ahead, Houston.
09 06 41 20 CC Roger. We can let the E-memory dump go if you get in a time bind, tracking the ascent stage, there. We would like you to turn BATT A charge off now, though.
09 06 42 05 CDR Houston, Apollo 9. Say again; I missed that.
09 06 42 09 CC Okay, Jim. We can let the E-memory dump go if you get involved tracking the ascent stage but we would like you to turn BATT A charge off now.
09 06 42 20 CDR Okay. Battery A charge is OFF now.
09 06 42 22 CC Alrighty.
09 06 44 57 CC 9, Houston. We're watching the Marks and they're looking good.
09 06 45 01 SC Say again, please.
09 06 45 03 CC Roger. We're checking the Marks as they come in, and they're looking good.
09 06 45 07 CDR Okay.
Apollo 9, Houston.

Go ahead, Houston.

Roger. When you lose the LA, we'd like you to do a VERB 83 and tell us what range you are at.

Okay. Right now, he's against the earth background, and Dave can't see him. We've been Marking, but we just can't see him right now. AUTO OPTICS has been following him, but no more Marks for the last four minutes or so.

Okay. Understand.

I can pick him up every once in a while, but not long enough to get out of AUTO OPTICS and take a Mark. We'll have to process the last one before we call a VERB 83 up, anyway.

Okay, Dave.

Okay. You've got about 2 minutes to LOS, if you can do it before then.

Okay. I'm picking him up every once in a while. Maybe he'll get to a dark background in a little while where I can hold onto him.

Okay. If we lose you here, we'll pick you up in Tananarive.

ices. We'll pick up a VERB 83 as soon as we get through the last Mark.

Okay, Dave.

Apollo 9, Houston through Tananarive.

Roger, Houston. How do you read?

I read you loud and clear and just want you to know we are standing by at Tananarive, and we expect to talk to you in Hawaii at 224 14.
Roger, Apollo 9. Houston here. We are reading you a little better. We can go ahead and take some of your powerdown stuff now, if you have it.

Okay, Ready to copy, Al?

Yes. 51 set, Rusty.


Roger, Rusty. Copy. 51 54 40 48, 369 370 370, 50 50 OFF SCALE HIGH 50 49, 3125 6127 6027.

Roger. You missed one - 5.0 in the injector. 4.6 was 6 Delta.

Roger. We copied that.

Okay.

And while we have you on the line, did you get a range for LOS on the LM?

Roger. I got the figures for you - times. I didn't get you a good range because we can't run WRFB 83 along with P20, but those are the times for the first sightings to the last sightings and the beginning and the end of the Marks. Okay?

Okay. We're running out of coverage at Tananarive. I guess we'd better save it for Hawaii. See you there at 14.

Oh, very well.
09 08 16 16 CDR Houston, Apollo 9.
09 08 16 18 CC Apollo 9, Houston here.
09 08 16 20 CDR Roger. Hello there.
09 08 16 25 CC Houston, how do you read Apollo 9?
09 08 16 27 CC Apollo 9, Houston receive you loud and clear. Now are you doing?
09 08 16 32 CDR Pretty good. I've got a couple of questions for you.
09 08 16 34 CC Okay.
09 08 16 36 CDR Did you want us to leave inverter 3 on MAIN A and ... transformer on tonight just like last night?
09 08 16 42 CC That is affirmative, Apollo 9.
09 08 16 44 CDR Okay, we configured that right.
09 08 16 46 CC Okay. We've got a question for you: have you switched tanks on quad Charlie yet?
09 08 16 53 CDR Negative.
09 08 16 54 CC Okay. We're reading a little low quantity; we just wondered.
09 08 16 58 CDR No. Unless they've been inadvertently opened sometime during the flight, they should still be closed, and we have not switched them.
09 08 17 06 CC Roger, Apollo 9. Houston copies, and you want to give me that LM LOS stuff now?
09 08 17 18 CMP Okay. Let me give it to you real quick here. The first sighting we had was at 222 25 35. It wasn't good enough to Mark on, but we did pick him up occasionally. The first Mark was at 222 39 40. The last Mark was at 222 45 40. Then we saw him every once in a while until 222 51 43, and that was the last time we had any sightings at all.
Roger, Apollo 9. Understand you got your first sighting at 222.25.55. You didn't take a Mark. You got your first Mark at 222.30.40 and your last one at 222.45.40, and you had him in sight until 222.51.43.

Roger. The times we were not Marking we would only get a visual on him--maybe 2 seconds out of every 30 or 40, so you couldn't really get him lined up to take a Mark. But with the state vectors you have and with the machinery up there, it really looked pretty good.

Roger, Dave. Understand. Would you give us a VERB 66 and shift that state vector over now?

Okay. Give you a VERB 66 now.

And, Houston, Apollo 9. We have some information for reentry stowage.


Okay. We have the--one of the large suits and center-seat suit folded, and the L-shaped AGS underneath the center couch. We have a large pressure suit and all three helmets tied down on the floor between the L-shaped AGS and the lithium hydroxide canisters on the front part of the LEB floor. We're going to have two large bags of trash that'll probably be tied down in lower equipment bay, and we'll give you more on that tomorrow. The rest of the spacecraft will be stowed essentially the same, the one except being the food. E1--Locker B1, Bravo 1, that in lower equipment bay has just trash in it right now, and it will weigh somewhat less than it did at launch. Lockers B2 will be full of food. They'll have somewhat less than the food that was in them at launch, but we'll stuff some trash in there and try to at least fill them up. As I mentioned earlier, all the LM data is over in Al.

Roger. Apollo 9, Houston. Copy. Would you give us a VERB 76 right now, Jim?

Roger. VERB 76.

Three, 2, 1.

MARK.
And Houston, that's about all the data I have for KH2O. Essentially, the spacecraft is stowed pretty much the same way it was at launch, except for the LM data in Al. The two pressure system or L-shaped bags - both of them on the floor, and other pressure suit lying crossways in the LEB, just forward of the lithium hydroxide canisters.

Roger. Apollo 9, Houston. Copy all that, and the Gold Team would like to say to long to you; it's been a nice working.

Say, Gold Team, we've enjoyed every moment with you, and we'd sure like to thank you for all your help. We'll see you at the big debriefing that Mr. Kranz is going to arrange.

Roger. I think everybody's agreeable to that.

Okay. You've got a fine bunch of guys, let me tell you.

ASCENSION (REV 142)

Apollo 9, Houston through Ascension.
Apollo 9, Houston.
Apollo 9, Houston through Ascension.
Apollo 9, Houston.
Apollo 9, Houston through Ascension.
Apollo 9, Houston.
Apollo 9, Houston.
Apollo 9, Houston through Ascension.
Apollo 9, Houston.
Apollo 9, Houston.
Apollo 9, Houston.
Apollo 9, Houston.
REST PERIOD - NO COMMUNICATIONS
APOLLO 9 AIR-TO-GROUND VOICE TRANSCRIPTION

(GOSS NET)

(Tape 146/1
Page 621)

REST PERIOD - NO COMMUNICATIONS
REST PERIOD - NO COMMUNICATIONS
REST PERIOD – NO COMMUNICATIONS
(GOSS NET 1)

CARNARVON (REV 147)

09 17 36 26 CC (Alarm clock ringing) The alarm clock just went off, gentlemen.

09 17 36 30 CDR Roger. I thought I heard a little ding-a-ling there, Mr. Alarm Clock.

09 17 36 37 CC All right. Out of the sack, troops; let's get to work. Today you come here.

09 17 36 41 CDR Not diggity do! I think we're all ready.

09 17 36 46 CMP Okay. What would you like to do?

09 17 36 48 CC Okay. What do you have in front of you?

09 17 36 52 CMP ... switch, I think.

09 17 36 55 CC Okay. Do you want to start with the consumables?

09 17 37 00 CMP Okay. Stand by.

09 17 37 16 CMP Alrighty. Go with the consumables.

09 17 37 18 CC Okay. 23:4 hours: 42 10 42 12 33 13 38 13 195 11 40 31 29. Okay. And your DAP redline: 25 31 34 34.

09 17 38 01 CMP Roger. 23:4 42 10 42 12 33 13 35 13 195 11 40 31 39 25 31 34 and 34.

END OF TAPE
CARLARVON (REV 147)

05 17 38 19 CC Roger. And you've probably noticed, there, quad C is a little low. However, we still have both DAP and SCS capability using four jet/two jet.

09 17 38 31 CMP Okay. Understand.

09 17 38 33 CC All right. And one other comment before we get too far: I'd like to just mention that the DAP is still cycling, so when you get squared away on that - I just want to let you know that the DAP is still powered up.

09 17 38 53 CMP Oh, is it really? That's very interesting.

09 17 38 56 CC Okay. And, let me see. Oh, one thing else. I guess. I just for your info, on the batteries, we're computing that you've got 71 hours on the water, if that question ever comes up.

09 17 39 13 CMP Okay. Take a look at our VERB 46 right now.

09 17 39 19 CC Okay. The story I have here, Dave, is that you need a VERB 46 ENTER to really kill the DAP.

09 17 39 28 CDR I put that in last night, too, Stu.

09 17 39 30 CC Say again, please?

09 17 39 32 CDR I put that in last night, too.

09 17 39 34 CC Oh. Okay. We'll have them take another look then. Okay. I have some block data for you.

09 17 40 01 CMP Okay. Stand by.

09 17 40 11 CMP Okay. Go with the block data.

09 17 40 13 CC Okay. And make sure your S-band volume is up. We right pass over Honeysuckle before I finish up.

09 17 40 21 CMP All right.

09 17 40 22 CC Okay. Reading: 140 1 Bravo, plus 235, minus .640 233.55 99 414.8 114.1 Charlie, plus 314, minus 24 233 30 123 47.9 230 1 Bravo, plus 27, minus 31 237.77 09.35.59. 114.1 Charlie, plus 35, minus 236 240 09.31 241 0.36 293, minus 740 134 10 10.38, minus 10 0 10 10.38
plus 396, minus 1610 243.1 5h 3668; 154 4 Bravo, plus 316, minus 1600 241.92 5h 3668; 155 - Okay. I think I'm back with you again. I blot out on that 155 didn't I?

**HONEYSUCKLE (REV 147)**

09 17 41.0 CTP I blot you on the longitude at 154 4 Bravo.

09 17 45.09 CC Okay. Longitude: minus 1600 241.92 3.363; 155 4 Bravo, plus 239, minus 1594 246 35.09 3337; 156 Charlie Charlie, plus 122, minus 64.0, 243.1 5h 3668. Your pitch and yaw trim: minus 0.68, yaw minus 0.94. End of update.

09 17 45.39 CTP Okay. Yes, I didn't know we were going to go that far, but here you go: 154 4 Bravo, plus 296, minus 0310 237.97 30.446; 159 4 Charlie, plus 314, minus 0650 235.30 28.496; 153 4 Bravo, plus 270, minus 0310 237.97 30.496; 151 4 Charlie, plus 306, minus 0670 233.51 29.393; 152 4 Alpha, plus 233, minus 0650 240 32 58 3402; 153 4 Bravo, plus 336, minus 1610 243.1 5h 3668; 154 4 Bravo, plus 310, minus 1600 244.92 5h 3308; 155 4 Bravo, plus 239, minus 1594 246 35.09 3337; 156 Charlie Charlie, plus 122, minus 1640 248 11 54.33 33 33; with a pitch trim of minus 0.64, and a yaw trim of minus 0.94.

09 17 47.22 CC Roger. That's correct. Stand by one.

09 17 47.27 CTP Okay.

09 17 47.33 CC And, readback is correct, Dave.

09 17 47.38 CTP Alrighty.

09 17 47.43 CC And, since I was mean enough to wake you up with an alarm clock, I can give you some good news. The on-the-hour report from the Guadacanal says there are calm seas, winds are 5 knots, visibility 10 miles, 2000 scattered. And there are some 5-foot swells with about a 15-second period, and the ship is about 35 miles from the target point now.

09 17 48.13 CDR Hey, that's a pretty good description of the kind of weather we like.

09 17 49.17 CC Well, you put in an order, we strive to please.
You guys are absolutely outstanding. And, let me see. We've still got you here for about another 2 minutes. The regimented darkness as shown in your flight plan is off. It's slipped some. I might update you on that, if you think that will help you any on your planning. I'll just pull out the stations.

Okay. Let me get the flight plans. Just a minute.

Okay. Go ahead.

Okay. We've got you now in the nighttime coming across here, but you'll come out of this darkness on a just over Texas at about 23 - something like that. These times are just rough; I don't think you'll need them. And then you'll go back in darkness again right at 18, and that's at 236 plus 46, and come out over Guayas around 12. Okay. And then you'll hit back in again at 195 plus 46 over Curacao, come back into daylight about 237 plus 26, and then darkness again at 238 plus 26, and daylight at 238 plus 55. You probably should be realigned by then, but I'll give you the last one here. At 239 52 you'll go into darkness again, and come out just before the burn at 240 about 25.

And we're going to have LOS here momentarily. We'll pick you up over the Mercury - Stand by, I'll try to settle down here - oh, in about 4 minutes.

Okay. Fine.

MERCURY (NAV 147)

Apollo 11, Houston through Mercury.

Roger, Houston. We have you. Go.

Okay. We'd like to have inverter 3 OFF.

Roger. Inverter 3 OFF, now.

And also, just to set your mind at ease here in plenty of time, we'd like to tell you the question about two-jet versus four-jet in the burn. The two-jet would give you around 12 to 14 pounds per and, or about 1 pounds total. But we're sure as hell feel 12 to 14 pounds is a safe margin.
09 17 57 21 CDR  How much fuel do we have?  We have quite a bit of fuel extra, don't we?

09 17 57 27 CC  You're right on the redlines now, Jim. It's - It's right there. This is quad Charlie. Quad Charlie is right on the redlines, as you can see. We passed 33, and 34 is the DAP redline. But you know, this is within the gaging uncertainty, and so forth and so on. And that's -

09 17 57 55 CAP  Okay. B and D are well up, aren't they?

09 17 58 03 CDR  We'll do a two-jet, then, Stu.

09 17 58 06 CC  Okay. You'd like to do a two-jet, then?

09 17 58 10 CDR  Yes. We'll do a 10-second two-jet on - what? B and D, I guess.

09 17 58 15 CC  Roger, Jim. We concur with that.

09 17 58 18 CDR  Okay. Thank you.

09 17 58 20 CC  Thank you.

09 17 58 28 CDR  Hey, Stu, why didn't we get a drop in pressure, and all that stuff? Is there any - Do the guys on the ground think that maybe we have the secondary propellant fuel pressures OPEN on quad C?

09 17 58 44 CC  That appears to be a good possibility; as we told you, it should have opened up. There's a plus or minus 6 percent on that doggone estimate. So you - But still yet we should be down below that. And so, the feeling here is, it's quite possible that that secondary valve is OPEN.

09 17 59 13 CDR  Okay.

09 17 59 18 CC  We did a lot of talking about that here this morning, and you know we had those funnies on that - on that separation. And we're - We're just not real sure.

09 17 59 31 CDR  Yes. That's sort of what I was thinking of, too. Hey, have you done anything - any new information on our DAP here?

09 17 59 45 CC  No, we sure hasn't. You know we got us squared away down here, to make sure we're reading right, could you give us a VERB 46 DAP?
Okay. I'll proceed out of the VERB 48; then we'll give you VERB 48. Okay. Here comes the VERB 48 now.

Okay.

Okay. That got us squared away, Jim, and we show the DAP in good shape.

You mean the DAP really was running, then?

All our data showed it was; yes.

I'll be darned. We got three-way verification on that last night, but maybe it didn't get in.

Roger. Copy.

Hey, Stu.

Go ahead, Dave.

Yes, we just decided to have a six-I verification on the DAP. You want to add two?

Okay.

Okay. Apollo 9, Houston. I have you for another couple of minutes; before I lose you here at Mercury, I guess I can cover a couple of changes that we'd like in the flight plan.

Okay. Stand by. 

And by the way, you want to come off the H2 fan 2?

Stand by.

That's negative. We do not want it OFF, we'll leave it just like it is.

Okay. Go with your changes and I've got a question for you after you get through.

Okay. Why don't you go ahead and ask it, Dave? We're going to lose you probably, in about a minute and a half, and I'll cover these changes when we see you over Texas at 30.

Okay. Do you want to activate the primary boiler? And, if so, do you want to overfire first? And, we've talked to you about this several times, but we think it's a
Roger. Copy two questions. One is whether you want to reservice the primary boiler before you activate it, and you have decided you'd like to cold-soak. We'll try to give you a recommendation on that.

Okay. Fine.

And, we're approaching LOG here, troops. We'll see you about 23.

Roger. 20.

Apollo 9, Houston. We have you in good lock.

Roger. Houston, Apollo 9. We're still here.

Very good. And on your questions, we concur with the cold-soak. On the water boiler, we say do not reservice it prior to bringing it up. The reason for this is, we are not sure how much water is in there, and we would like to go ahead and bring it up and see whether it will dry out. It should dry out in the first day/night passes, and we'll be looking at it.

Okay. So you want us to bring it up right now?

That's affirmative. Let's bring - Go ahead and bring it on the line.

Alrighty. Here we go.

Hey, Houston, 9. Do you have one of those handy-dandy map updates around?

Roger. Stand by one, here. While I'm trying to locate that ditty, I'd like to pass up a couple of changes to you.

Okay. Stand by a second.

Okay. Go with your changes, Stu.

Okay. On your CO₂ filter change at 236, or at - the second line, should read 8 to 8, reuse 20 to 26.

Roger. understand. 8 to 8, rework 3 to 36.
Okay. Now with the addition of the other rev, there is a lot of changes, such as the time you do the star check and all that, which I really don't think you need. But I've got them all written out here, and the times, if you'd like to take that.

No. I think what we're going to do is get the IMU up, and on the next rev do a PSL and get it all squared away. And then, the nightside pass before the orbit burn, we're going to get to the burn altitude early and make sure we get a good solid star check, because the horizon probably won't be too good just prior to the RETRO.

Okay. Real good. As to most of the flight plan changes I have here, they are just reflecting change in daylight and dark and the addition of the rev; so, that's really, I believe, all you need to change on your flight plan this time. And we do have a couple of, would you believe, changes to the entry checklist I'd like to talk to you about.

Well, I believe that. You've had about 10 days, and I'd be surprised if you didn't have any changes.

Okay. And I found my map update sheet here, if you want to take that too.

Okay. Go with the map update, and we'll dig out the entry checklist in the meantime.

Okay. RW 147, which is completing, 234 15 36; latitude, 107 west.

Roger. Lat 15 36; 107 west. Right?

Okay. Go ahead with the entry checklist, Stu.

Okay. Let's start here on page 21 dash 1.

All right.

Okay. The first one - these are out now, but I'll just toss in the reminder - the very first line on panel D, your heater gaging circuit breakers main A and main B, we want those OFF.

Okay. Got that.
showing 16 MAIN B. We'd recommend the command module 1 MAIN A, command module 2 MAIN B, and AC roll MAIN B.

09 18 28 05 LMP  Okay. I guess that's a mix. Well do that.

09 18 28 10 CC  All right. And now, on page E1 dash 6, right at the top right under C, you can just delete the stir the tanks.

09 18 28 25 LMP  Okay. Just delete step C, is that right?


09 18 28 36 LMP  Okay. Go ahead.

09 18 28 39 CC  All right. On page E1 dash 13/14.

09 18 28 47 LMP  Go.

09 18 28 49 CC  Okay. Here, the third line down, the SCS LOGIC 2 on UP: we'd like to have that moved just above the ASSH confirmed 20 for PYHO ARM. And essentially, what we're trying to do here, is make sure that you have your ELS to ELS, ELS LOGIC 2 on off. Then, when you throw the SCS LOGIC, we know we're all squared away to give you a GO.

09 18 29 18 LMP  Okay, Houston. Understand. It'll read of sequential arm 2 CLOSE, ELS auto and ELS logic on, and then, sequential logic 2 on UP.

09 18 29 23 CC  That's affirmative. Jobly good on that one. Now, on page E2 main 1.

09 18 29 39 LMP  Okay. Go.

09 18 29 41 CC  And this I know you're well aware of. I'm just tossed it in with our decision to 6 in the two-jet village: that register 1 under the bay 10102.

09 18 29 54 LMP  Okay. 10102. Go ahead.

09 18 29 57 CC  Okay. On page E2 main 3.

09 15 30 01 LMP  Go.

09 16 30 02 CC  All right. Now, later in minus second, we'd like to - the first two lines there, we'd like to reverse the order of them. We'd like to
have the tape recorder record high-bit rate
FORWARD, to be first, followed by average g
on up-telemetry command RESET and then NORMAL.

09 16 30 29 LMP
Okay. So it will read this way: tape recorder
record high-bit rate FORWARD, and then average g
on up-telemetry command RESET, and then NORMAL.

09 18 31 39 CC
That's affirmative. And, just for your info,
that's just to keep us from having to reacquire
the cold lock. Okay. And now over on page
E2 dash C.

09 18 30 58 LMP
Go ahead.

09 18 33 55 CC
Okay. We're showing AUTO RCS select command module
1 MAIN P. Change that to read MAIN A and this
will agree with the configuration that we recom-
manded over on the first page.

09 18 31 13 LMP
Okay. So it will read AUTO RCS select CM 1 MAIN A.

09 18 31 19 CC
That is affirmative.

09 18 31 24 LMP
Go ahead.

09 18 31 29 LMP
Okay: That's all I have.

09 18 31 30 CC
Gee. That's not bad at all.

09 18 31 31 CC
Very good.

09 18 31 37 LMP
Okay. Well, I guess everything else is squared
away on that. We went through it last night and
we don't have any questions on it. So if you see
anything else, you can give a whistle.

09 18 31 43 CC
Okay. We sure will.

VANGUARD (REV 148)

09 18 38 24 CC
And, Apollo 9, Houston. I was a little surprised
asking for that map update. Are you all going to
be taking any pictures this morning?

09 18 38 31 CDS
Say, listen. We're the world's greatest spectators.

09 18 35 35 CC
Okay. Are you going to have your cameras out at
all this morning, Jim?
09 18 38 40 CDB No, we really don't have much in the way of film left, Stu. We've got about 15 frames on the Hasselblad left and we've got about - oh, I think we have three film packs for the 16mm, and have about a quarter of a roll left on them. We do plan on taking pictures of the reentry. We have one full roll of 16mm reserved for that.

09 18 39 20 CC Okay. The reason why I asked you, we've got a WAC in here from Australia, requesting some specific pictures, and I wasn't even going to mention it to you. I thought on reentry, if you would be interested, but if you've got a camera out coming across Australia, why, there's some people down there want some pictures.

09 18 39 21 CDB That's okay. We've been trying to get a picture of Australia, too. When are we going to get across?

09 18 39 27 CC Well, let me check my terminator here. I think you're going to be in darkness but, Perth - In regards to your comment the other night - Perth wanted some pictures of their lights.

09 18 39 41 CDB Okay. We'll see what we can do here. Give us the time.

09 18 39 45 CC Roger. Will do.

09 18 40 51 CC Okay, Jim. For the picture of Perth - You might bring up your S-band volume, here, too. We'll be going over to Madrid.

MADRID (REV 142)

09 18 41 06 CMP Go ahead with the times, Stu -

09 18 41 07 CDB - - Ahead, Stu. We're here.

09 18 41 08 CC Okay. We don't have your time, now. To get Perth, it's going to be two hours from now, and the best time it's putting you is up at about 23 3/4 plus 17, which looks like it's getting up toward the busy section.

09 18 41 24 CDB Okay. We'll write it down on the flight plan. If we can get it, we'll try to get it.

09 18 41 29 CC Okay. Let me give you the exact time, here, for Perth. It'll be 23 3/4 plus 17 plus 11. That's your exact time.
09 18 41 44 CMP Okay. Will they be north or south of track?

09 18 41 48 CC You'll be just about over them. You'll have about an 82-degree angle on them, so you'll be coming right over in about 226 miles.

09 18 41 58 CMP Okay.

09 18 41 58 CC Okay. Apollo 9. We've got about a minute here, I believe, off of Madrid. Can you give us a cross-station report? If not, we'll catch you at Carnarvon or Ll.

09 18 43 22 CDR This is the commander. I had about 6 hours of good sleep, about 1 hour of poor sleep, and I took one Actifed.

09 18 43 29 CMP I had some - CMP - and I had about 7-1/2 hours of good sleep and - No; I had a vitamin pill yesterday.

09 18 43 37 CDR And I had a vitamin pill, too.

09 18 43 42 CC Roger. I copy both.

09 18 43 47 LMP Rusty had 8 hours of good sleep, one Seconal, one Actifed, and one vitamin pill.

09 18 43 54 CC Roger. Understand. Thank you very much.

END OF TAPE
CARNARVON (REY 113)

09 19 12 26  CC  Apollo 9, Houston through Carnarvon. Standing by.

09 19 12 35  SC  Roger. Houston, Apollo 9.

09 19 12 35  CC  Read you loud and clear.

09 19 12 15  CDR  Houston, Apollo 9.

09 19 12 16  CC  Go ahead, Apollo 9.

09 19 12 19  CDR  What quads do you want to use for the early part of today? A and B or --

09 19 12 26  CC  Roger. Copy. Stand by.

09 19 12 50  CC  Okay. Apollo 9, Houston. We're recommending that you just go ahead and use all of them for this since we won't really be using that much, and we'd like to have all four ON bringing up the platform.

09 19 13 04  CDR  Okay. You'd like to have all four of the quads ON when we bring up the platform?

09 19 13 08  CC  That is affirmative. And you can just go ahead and leave all four ON with the exception of the two jet ullage that we've already discussed.

09 19 13 18  CDR  Okay.

09 19 17 14  CC  Would you bring up your S-band? We'll be going over to Honeysuckle in a couple of minutes.

09 19 17 20  CDR  Okay.

HONEYSUCKLE (REV 1118)

09 19 23 02  CC  Apollo 9, Houston.

09 19 23 45  CDR  Go ahead. Houston, Apollo 9.

09 19 23 47  CC  Roger. Guadalcanal is on station and is waiting.

09 19 23 51  CDR  Very good. Thank you.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 19 23 53</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>09 19 23 59</td>
<td>CDR</td>
<td>Houston, what are you talking to us through?</td>
</tr>
<tr>
<td>09 19 24 02</td>
<td>CC</td>
<td>Stand by one, and I'll see what I'm uplinking. Wait. We're through Honeysuckle; it's got to be S-band.</td>
</tr>
<tr>
<td>09 19 24 03</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>09 19 24 23</td>
<td>CC</td>
<td>And, Hull - Houston. Jim, since you were so agreeable about that picture of, particularly of Perth - there, that was - The data I gave you was for REV 130. You'll come within about 80 miles of it or the next REV around, if you'd like to take that time, if you think it's going to be feasible.</td>
</tr>
<tr>
<td>09 19 25 12</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>09 19 25 45</td>
<td>CC</td>
<td>Are you ready to copy?</td>
</tr>
<tr>
<td>09 19 25 45</td>
<td>CDR</td>
<td>We sure can see a lot of lights down on the city - down on the ground right now, Stu.</td>
</tr>
<tr>
<td>09 19 25 45</td>
<td>CC</td>
<td>Roger. There's two cities - Well, there's actually three. Sidney will be about 220 miles off your track the next time around, but Perth and Brisbane both are - Perth will be 80 and Brisbane 110. And sure like to get some pictures of those, if you can work it in.</td>
</tr>
<tr>
<td>09 19 26 01</td>
<td>CDR</td>
<td>Okay. Just a second.</td>
</tr>
<tr>
<td>09 19 26 05</td>
<td>CC</td>
<td>Roger. No sweat. It will be on the next REV.</td>
</tr>
<tr>
<td>09 19 26 09</td>
<td>SC</td>
<td>Okay. Why don't you go ahead and give us the data here; I'll write it down now.</td>
</tr>
<tr>
<td>09 19 26 14</td>
<td>CC</td>
<td>Okay. For Perth, your time of closest approach: 235 plus 61 plus 36. And Perth will be 80 miles north of track.</td>
</tr>
<tr>
<td>09 19 26 29</td>
<td>CDR</td>
<td>Okay. And what's the other one?</td>
</tr>
<tr>
<td>09 19 26 30</td>
<td>CC</td>
<td>Okay. The other one will be Brisbane: 130 235 60 plus 41. And it will be 110 miles north of the track.</td>
</tr>
<tr>
<td>09 19 26 53</td>
<td>CDR</td>
<td>Okay. Very good. We'll try to get them.</td>
</tr>
<tr>
<td>Time</td>
<td>Call</td>
<td>Text</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>09 19 26 55</td>
<td>CC</td>
<td>Okay. And I don't whether you can reach out 220 miles or not, but if you've not your camera out, I might as well give you one for Sidney, and that will wipe us out.</td>
</tr>
<tr>
<td>09 19 27 05</td>
<td>CC</td>
<td>Okay. Go ahead.</td>
</tr>
<tr>
<td>09 19 27 15</td>
<td>CC</td>
<td>All right. Sidney: PCA 236 plus 59 plus 37. And Sidney will be 220 miles south of track.</td>
</tr>
<tr>
<td>09 19 27 25</td>
<td>CC</td>
<td>Okay. We've have two north and one south. Is that correct?</td>
</tr>
<tr>
<td>09 19 27 30</td>
<td>CBR</td>
<td>That is affirmative. And you'll hit Perth first, of course. By the time - We're going to leave here at Honeysuckle; see you over the Mercury around 91.</td>
</tr>
<tr>
<td>09 19 28 03</td>
<td>CBR</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>09 19 28 10</td>
<td>CC</td>
<td>Apollo 9, Houston. Go.</td>
</tr>
<tr>
<td>09 19 28 19</td>
<td>CC</td>
<td>You're over the hill, I believe.</td>
</tr>
</tbody>
</table>

**MERCURY (HEV 148)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 19 30 54</td>
<td>LMP</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>09 19 31 01</td>
<td>CC</td>
<td>Apollo 9, Houston. Go.</td>
</tr>
<tr>
<td>09 19 31 04</td>
<td>LMP</td>
<td>Roger. Would you tell the good people of Sidney that we saw their lights about 5 minutes ago. It was a very beautiful sight.</td>
</tr>
<tr>
<td>09 19 31 11</td>
<td>CC</td>
<td>Good. Mighty fine. Thank you.</td>
</tr>
<tr>
<td>09 19 31 17</td>
<td>CBR</td>
<td>Good morning, Ron. How are you?</td>
</tr>
<tr>
<td>09 19 31 19</td>
<td>CC</td>
<td>Hey, fine shape, and all set to go.</td>
</tr>
<tr>
<td>09 19 31 22</td>
<td>CBR</td>
<td>Very good.</td>
</tr>
<tr>
<td>09 19 31 26</td>
<td>LMP</td>
<td>Where you going, Ron?</td>
</tr>
<tr>
<td>09 19 31 30</td>
<td>CC</td>
<td>Hey, that's a good question, come to think of it.</td>
</tr>
</tbody>
</table>
| 09 19 40 51 | CC | Apollo 9, Houston. About LOS; will pick you up at Reistone !
09 19 40 57  CDR  Roger.
09 19 41 35  CMP  Houston, you got enough to get the gyro torquing angles, or did you copy them?
09 19 41 41  CC  No. We missed them.
09 19 41 43  CDR  Do you want to read them?
09 19 41 45  CC  Negative. Go.
09 19 41 46  CMP  Okay. SOC was 230300, minus 00128, minus 00736, plus -

REDSTONE (REV 1A)

09 19 49 44  CC  Apollo 9, Houston.
09 19 49 48  CMP  Houston, Apollo 9. Go.
09 19 49 50  CC  Roger. We copied your torquing angles, and we'll have you all the way through Canaries. LOS will be 19.
09 19 49 59  CMP  Okay. Did you copy what type alignment it was?
09 19 50 03  CC  Negative.
09 19 50 05  CMP  Okay. We did a nominal to time 2h0 30 08 in order to get the platform up into place.
09 19 50 16  CC  Roger. Copy.
09 19 57 26  CMP  Houston, Apollo 9.
09 19 57 29  CC  Apollo 9. Houston. Go.
09 19 57 32  CMP  Roger. Our original flight plan schedule was for a H_2 purge this morning, and did you want us to do that?
09 19 57 44  CC  Stand by one, there.

SHAYNE (REV 49)

09 19 58 00  CC  Apollo 9, Houston. The fuel cells are looking good here. Disregard H_2 purge.
Tape 151/5
Page 341

09 19 58 06 LMP Okay.
09 19 58 07 CC Request ECO in 10CEPE, then we'll have a state vector and target load and the REFROMAT for you.
09 19 58 14 CHP You've got it.
09 19 58 17 CC Roger. Coming up.

09 20 01 05 CC Apollo 15, Houston. I have your maneuver PAD.
09 20 01 06 CHP Okay. Stand by.
09 20 01 30 CC Okay. Ready to copy, Ron.
09 20 01 34 CC Okay. From the Mars J curve, 246 34 1378, minus 0659, plus 0250, plus 0325 0306 0136 243288, minus 0659, minus 0325 02610 32900, minus 2990, plus 10536 2392. Over.
09 20 03 13 CHP Okay. 152 dash 1 Alfa, 246 34 1378, minus 01969, all zips, plus 0250 03250 0306 0136 243288, minus 0659, minus 0325 02610 32900, minus 2990, plus 10536 2392. Over.
09 20 03 54 CC Roger. That is correct.
09 20 04 10 CC Apollo 15, Houston. The computer is yours. You have a state vector, target load, REFROMAT, and we've VSSH 66ed it.
09 20 04 19 CDR Oh, very well. That sounds like a full day's work. Thank you.
09 20 04 24 CC Roger. If you're in a copying mood, I have your entry PAD.
09 20 04 31 CDR Okay. Stand by one.
09 20 05 09 CDR Okay. Go ahead.
09 20 05 13 CC Roger. Area: 152 dash 1 Alfa, 046, plus 2225, minus 0250 014015 20900 15 27 16 08, minus 03177. The roll right: 20 60 19 03 15 55 29 23 46 33, plus 01, plus 075. Over.
09 20 05 35 CDR Okay. I've got 152 dash 1 Alfa, 046, plus 2225, minus 0250 20900 15 27 16 08, minus 03177. Right turn 20 60 19 03 15 55 29 23 46 33, plus 01, plus 075. Over.
Apollo 9, Houston. Your readback is correct.

Houston, 9, again. Let me recheck the CO₂ filter, would you? Which one was 20 supposed to replace? Number 8 or number 9?

Stand by one, there.

Okay. Thank you.

Houston, Apollo...

Apollo 9, Houston. Go.

I think I have it sorted out now. You want to put 8 and 9 in; you want to take 9 out and put in B6; and take 20 out and put it in A5. Is that right?

9, Houston. I think that's 9, Houston. I think that's correct, there, but let me double check it with WAC.

Okay. Thank you.

Apollo 9, Houston.

Go ahead, Houston.

Okay. Here's the way the canister - the way I take it. You put 8 and 9 in - 8 in the B slot, 9 in the A slot, and close the door; and you take 20 and stow it in B6; and you take number 1 canister and stow it in Alpha 3.

Okay. That's what I thought. We just wanted to make sure that we got the right ones going in the right place because, surprisingly enough, the CO₂ canisters were not marked for the flight.

Roger. Copy.

Apollo 9, Houston. I have a comment for your entry update.

Houston, Apollo 9.

CO2RY (REV 119)
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 20 12 53</td>
<td>CDR</td>
<td>Roger, how do you read now?</td>
</tr>
<tr>
<td>09 20 12 54</td>
<td>CC</td>
<td>Roger, loud and clear. Your comment for your entry update there is: you put the 51.4-degree window mark on the horizon at 0.06g.</td>
</tr>
<tr>
<td>09 20 13 20</td>
<td>CDR</td>
<td>Okay, understand the 51.4-degree line on the window on the horizon at 0.06g.</td>
</tr>
<tr>
<td>09 20 13 24</td>
<td>CC</td>
<td>Roger. We will lose your sextant star at 000 plus 10 plus 53.</td>
</tr>
<tr>
<td>09 20 13 49</td>
<td>CDP</td>
<td>Understand. We lose the sextant star at 240 16 53.</td>
</tr>
<tr>
<td>09 20 13 45</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
</tbody>
</table>

END OF TAPE
APOLLO 9 AIR-TO-GROUND TRANSCRIPTION

(GOSS NET 1) Tape 152/1
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CARNARVON (REV 149)

09 20 49 16 CC Apollo 9, Houston through Carnarvon.
09 20 49 16 CMP Roger, Houston. Go.
09 20 49 18 CC Roger, Dave. We're not getting any EKG on you. If it's something real simple, fine; otherwise, we'll just put by with your respiration.
09 20 49 30 CMP Okay. I'll give it a quick check.
09 20 52 16 CC Apollo 9, Houston. Looks like you fixed the EKG, there.
09 20 53 06 CMP Say again.
09 20 53 08 CC Roger. It looks like your EKG is good now.
09 20 53 12 CMP Oh, okay. It was a loose connector.
09 20 53 17 CC Roger.

HONEYSUCKLE (REV 149)

09 20 55 05 CC Apollo 9, Houston. S-band volume up for Honeysuckle.
09 20 55 08 SC Roger. S-band up for Honeysuckle.
09 21 06 47 CMP Houston, Apollo 9.
09 21 06 49 CC Apollo 9, Houston. Go.
09 21 06 56 CC Apollo 9, Houston. Go. We read you.
09 21 07 09 CMP Houston, Apollo 9.
09 21 07 12 CC Apollo 9, Houston. Go.
09 21 07 15 CMP Roger. Did you get the gyro torqueing angles?
09 21 07 18 CC Negative. You went over the hill just before we got them.
09 21 07 22 CMP Okay. GT of 237 05 30, minus 00395, minus 00223, plus 00553. And that's to the desired REFSEMAT that you sent up.
09 21 07 31 CC Roger. No copy.
(GOSS NET 1)

MERCURY (REV 149)

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 21 09 14</td>
<td>CDR</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>09 21 09 16</td>
<td>CC</td>
<td>Apollo 9, Houston. Roger.</td>
</tr>
<tr>
<td>09 21 09 17</td>
<td>CDR</td>
<td>Did you want an E memory dump today?</td>
</tr>
<tr>
<td>09 21 09 23</td>
<td>CC</td>
<td>That's affirmative. Stand by, and I'll give you a time of it.</td>
</tr>
<tr>
<td>09 21 09 27</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>09 21 10 30</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>09 21 10 33</td>
<td>CDR</td>
<td>Go ahead, Houston. Apollo 9.</td>
</tr>
<tr>
<td>09 21 10 34</td>
<td>CC</td>
<td>Roger. The computer was powered up all night, so I guess we don't need an E mem - it mod dump.</td>
</tr>
<tr>
<td>09 21 10 40</td>
<td>CDR</td>
<td>Okay. Very good.</td>
</tr>
<tr>
<td>09 21 12 01</td>
<td>CDR</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>09 21 12 03</td>
<td>CC</td>
<td>Apollo 9, Houston. Go.</td>
</tr>
<tr>
<td>09 21 12 10</td>
<td>CDR</td>
<td>Houston, we were doing a INKY lamp test there, and I hit a RESET at the end of the thing; got a 212 ALARM, which in our book says PIPA failed or PIPA not being used. Says do a PIPA bias check. What do you think about that?</td>
</tr>
<tr>
<td>09 21 12 35</td>
<td>CC</td>
<td>Apollo 9, Houston. I think that's the same thing we saw the other night when you did that, and we think it's normal, but stand by one.</td>
</tr>
<tr>
<td>09 21 12 45</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>09 21 12 50</td>
<td>CC</td>
<td>And, 9, Houston. We're getting bias checks down here anyhow, so PIPA bias check not necessary.</td>
</tr>
<tr>
<td>09 21 12 59</td>
<td>CDR</td>
<td>Okay. I think - but you understand the question? we got a 212 ALARM, and I guess you can see it on the PPI as well as we can, so okay.</td>
</tr>
<tr>
<td>09 21 13 03</td>
<td>CC</td>
<td>Affirmative. We understand.</td>
</tr>
<tr>
<td>09 21 13 11</td>
<td>CDR</td>
<td>Alright.</td>
</tr>
<tr>
<td>09 21 13 09</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
</tbody>
</table>
09 21 14 13  CC Roger. We're sure that's a normal thing. It's the power supply that gets interrupted when you do that DEXY check, and all you have to do now is hit ERROR RESET.

09 21 14 26  CDR Good. We're very good at that ERROR RESET.

09 21 11 21  CC Okay.

09 21 11 35  CC Apollo 9, Houston. We'll pick you up at Redstone at 20.

09 21 15 42  CDR Roger. Redstone at 20.

REDSTONE (REV 149)

09 21 23 37  CC Apollo 9, Houston.

09 21 23 40  CDR Go ahead, Houston.

09 21 23 41  CC Roger. We still have the secondary loop coming on the line, and we'll have you until about 54.

09 21 23 47  CDR Okay. Very good.

GUAYMAS (REV 150)

09 21 37 42  CDR Houston, Apollo 9. Do you read?

09 21 37 44  CC Apollo 9, Houston. Affirmative. Go.

09 21 37 46  CDR Okay. We are going to open our secondary propellant fuel pressure valves in the service module RCS, now.

09 21 37 52  CC Roger. Go ahead.

09 21 38 32  CDR Houston, Apollo 9. We've opened all. Did you see any change of state in anything on the ground?

09 21 38 39  CC Negative. No change down here; which is good.

09 21 38 43  CDR Yes.

09 21 53 00  CC Apollo 9, Houston. After 1 minute LOS; Transmission at 57. Orbit will be at 29.
Apollo 9, Houston through Transarive.

Hello, Houston. This is Apollo 9.

Roger. If you turn H

Okay. You want the two CC in H

Okay. Tanks 1 and 2 ...

Roger.

Houston. You want the heaters ON, also - to get the pressure up?

Apollo 9, Houston. Say again.

Roger. Do you want the heaters ON, also - to get the pressure up?

Apollo 9, Houston. Negative.

Carnarvon (Rev 150)

Apollo 9, Houston through Carnarvon.

Hello, Houston. Apollo 9, here. We're just doing our star attitude check at this time, and we're going to follow that up with the last PSS to RNSM14T. We're standing by at the 1-hour point on our checklist.

Roger. We copy. Tell Dave to watch out for a flare from Perth at 26, and don't mistake it for his sextant star, there.

Okay.

Houston, which direction is Perth from our track? North or south?

Roger. It should be 23 miles north.
<table>
<thead>
<tr>
<th>Time</th>
<th>Station</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 22 27 01</td>
<td>CMP</td>
<td>Houston, Apollo 9.</td>
</tr>
<tr>
<td>09 22 27 03</td>
<td>CC</td>
<td>Apollo 9, Houston. Go.</td>
</tr>
<tr>
<td>09 22 27 06</td>
<td>CMP</td>
<td>Okay. Three S's on the DSKY.</td>
</tr>
<tr>
<td>09 22 27 10</td>
<td>CC</td>
<td>Roger. We copy.</td>
</tr>
<tr>
<td>09 22 27 18</td>
<td>CMP</td>
<td>And we're just a tad off on attitude.</td>
</tr>
<tr>
<td>09 22 27 22</td>
<td>CC</td>
<td>I've got an oddball CCAS star there, if Jim wants to look at it.</td>
</tr>
<tr>
<td>09 22 27 29</td>
<td>CMP</td>
<td>Okay. What is it?</td>
</tr>
<tr>
<td>09 22 27 34</td>
<td>CC</td>
<td>Roger. It's - I can't even pronounce it - Y-H-S. But it's a fourth magnitude star closest to Regor, on a line between Regor and Alphard.</td>
</tr>
<tr>
<td>09 22 27 52</td>
<td>CC</td>
<td>And it should - -</td>
</tr>
<tr>
<td>09 22 27 53</td>
<td>CMP</td>
<td>Hey, you - -</td>
</tr>
<tr>
<td>09 22 27 55</td>
<td>CC</td>
<td>Say again.</td>
</tr>
<tr>
<td>09 22 27 59</td>
<td>CMP</td>
<td>You really found - -</td>
</tr>
<tr>
<td>09 22 28 05</td>
<td>CC</td>
<td>We really found a good one. It should be about a half of a degree up and 1.7 degrees to the left.</td>
</tr>
<tr>
<td>09 22 30 17</td>
<td>CC</td>
<td>Honeysuckle (KEV 150)</td>
</tr>
<tr>
<td>09 22 30 33</td>
<td>CDR</td>
<td>Apollo 9, Houston. S-band volume up for Honeysuckle.</td>
</tr>
<tr>
<td>09 22 30 38</td>
<td>CC</td>
<td>Roger. Honeysuckle, and S-band up. David came through on the last one. Look at that! All balls!</td>
</tr>
<tr>
<td>09 22 30 43</td>
<td>CDR</td>
<td>Hey, beautiful. You guys are getting pretty good up there.</td>
</tr>
<tr>
<td>09 22 30 44</td>
<td>CMP</td>
<td>Well, we want to go out with a flash, here.</td>
</tr>
<tr>
<td>09 22 30 47</td>
<td>CC</td>
<td>I'm going to hang it up right now.</td>
</tr>
<tr>
<td>09 22 30 47</td>
<td>CC</td>
<td>Okay.</td>
</tr>
</tbody>
</table>
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09 22 32 08 CDR Houston, Apollo 9.
09 22 32 10 CC Apollo 9, Houston. Go.
09 22 32 12 CDR How long before retrofire do we come out into daylight? Will I have a daylight horizon - horizon - or not?
09 22 32 17 CDR Roger. You have sunrise at 25. Burn time is at 31.
09 22 32 32 CDR Okay.
09 22 32 35 CC And, 9. Houston. We moved over there a bit in our orbit; we'll use antenna Bravo for the deorbit burn.
09 22 32 44 CDR Okay. Antenna Bravo for deorbit burn.
09 22 32 48 CC And we'll still stay on Charlie for entry.
09 22 32 53 CDR Okay.

GOLDSTONE (REV 150)

09 22 56 47 CC Apollo 9, Houston.
09 22 56 49 CDR Roger. Houston, Apollo 9.
09 22 56 51 CC Roger. We've been integrating your state vector, and we'd like to update you another one. We'll do it in about 2 minutes at Redstone.
09 22 57 01 CDR Okay.
09 22 57 05 CDR Okay. You've got POC in ACCEPT.
09 22 57 06 CC Roger. We'll do it probably at 58.
09 22 57 12 CDR Okay.

GOLDSTONE (REV 150)

09 22 59 48 CC Apollo 9, Houston.
09 22 59 50 CMP Go ahead. Houston, Apollo 9.
09 22 59 59 CC Roger. We had real weak signal strength there at Redstone. We'll check it up at Redstone.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 23 00 01</td>
<td>CMP</td>
<td>Okay. Very good. Get it at Goldstone.</td>
</tr>
<tr>
<td>09 23 00 22</td>
<td>CC</td>
<td>9, Houston. Request ACCEPT.</td>
</tr>
<tr>
<td>09 23 00 26</td>
<td>CMP</td>
<td>Roger. You've got it.</td>
</tr>
<tr>
<td>09 23 01 14</td>
<td>CC</td>
<td>Apollo 9, Houston.</td>
</tr>
<tr>
<td>09 23 01 17</td>
<td>CMP</td>
<td>Go ahead. Houston, Apollo 9.</td>
</tr>
<tr>
<td>09 23 01 26</td>
<td>CMP</td>
<td>Roger. We'd like for you to whip through P30 and P40 again and reload those two programs. After you -</td>
</tr>
<tr>
<td>09 23 01 29</td>
<td>CMP</td>
<td>We've got a 2101 on the DSKY now flashing. Can you get in, or are you through, or what?</td>
</tr>
<tr>
<td>09 23 01 31</td>
<td>CC</td>
<td>Negative. We are not through yet. Soon as the computer is yours, you can go into that. And I have a NAV check here if you want it.</td>
</tr>
<tr>
<td>09 23 01 40</td>
<td>CMP</td>
<td>All right. Stand by.</td>
</tr>
<tr>
<td>09 23 01 51</td>
<td>CMP</td>
<td>Okay. Go ahead with the NAV check.</td>
</tr>
<tr>
<td>09 23 01 53</td>
<td>CC</td>
<td>Roger. 240 00 0000, minus 3112, plus 10039 2298. Over.</td>
</tr>
<tr>
<td>09 23 02 18</td>
<td>CMP</td>
<td>Roger. 240 00 0000, minus 3112, plus 10039 2298, and just what exactly are you uplinking on this mode?</td>
</tr>
<tr>
<td>09 23 02 31</td>
<td>CC</td>
<td>We are just uplinking a state vector.</td>
</tr>
<tr>
<td>09 23 02 34</td>
<td>CMP</td>
<td>Okay. State vector uplink. I understand.</td>
</tr>
<tr>
<td>09 23 02 37</td>
<td>CMP</td>
<td>Okay. That means we are going to have to re-load P30.</td>
</tr>
<tr>
<td>09 23 02 40</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>09 23 03 33</td>
<td>CC</td>
<td>Apollo 9, Houston. The computer is yours.</td>
</tr>
<tr>
<td>09 23 03 38</td>
<td>CDR</td>
<td>Thank you.</td>
</tr>
<tr>
<td>09 23 03 39</td>
<td>CMP</td>
<td>Okay. We have got it, and we will go through P30 now for you.</td>
</tr>
<tr>
<td>09 23 03 42</td>
<td>CC</td>
<td>Roger. And we just wanted to give you a little better hit record than you had in playing ba- baseball a while back.</td>
</tr>
</tbody>
</table>
Oh, hey. We were real sorry in that ballgame. We should really be great today.

That's right.

Houston, Apollo 9.

Apollo 9, Houston. Go.

Okay. That gives us a tenth of a foot per second difference in \( \Delta V \). But I guess we can take that, huh?

9, Houston. Say again. I missed it.

I say that gives us about a tenth of a foot per second difference in \( \Delta V \). But I guess we can take that.

Roger.

Apollo 9, Houston. One minute LOS. Ascension 30.

Roger, Houston.

Apollo 9, Houston through Ascension.

Go. Houston, Apollo 9.

Roger, Jim. Your altimeter \( \Delta H \) is minus 100 feet, and your sea-water temperature is 75 degrees. The air temperature is about 75 degrees. Mighty fine.

Great. We put on two sets of long underwear too, just expecting it would be cold.

I missed it there.

I said we put two sets of long underwear on just so we'd be warm in the water.

Roger. I don't think it'll be necessary.
09 23 58 24 CC Apollo 9, Houston through Carnarvon.

09 23 55 27 CDR Roger, Houston. Apollo 9 here. Are you ready to support the arming and firing of the command module RCS pressurization?

09 23 58 35 CC Roger. We have a good lock on now. You can go ahead.

09 23 58 44 CDR Roger. LLS is coming to AUTO now. LLS logic ON now. SEQ ECS logic to ON now. Do we have a GO for arming the pyros now, Houston?

09 23 59 09 CC Affirmative. GO for arming the pyros.

09 23 59 40 CDR Houston, ON RCS PRESS Mark.

09 23 59 48 CDR Looks like we got both of them, Houston.

09 23 59 53 CC Roger. They're looking good here.

10 00 00 03 CDR Pyros coming OFF, Houston.

10 00 00 10 CC Roger.

10 00 01 54 CDR Houston, Apollo 9.

10 00 01 56 CC Apollo 9, Houston. GO.

10 00 01 59 CDR Are we going to retrofire over Hawaii?

10 00 02 02 CC Affirmative.

10 00 02 07 CDR Okay; so we can expect a voice countdown?

10 00 02 09 CC Affirmative.

10 00 02 10 CDR Very good.

10 00 02 13 CDR I have 29 minutes on my Mark.

10 00 02 15 CDR MARK.

10 00 02 16 CC We're right with you.

10 00 02 19 CDR Okay. Next time it's your turn.

10 00 02 20 CC Roger.
Apollo 9, Houston. We've dumped the tape recorder, rewound it, and it's yours now.

Roger.

And, 9, Houston. We'll have you through the Huntsville until 23. Pick you up at Hawaii at 25.

Very good.

Right now we're just sort of holding, getting ready to enter F40. We'll enter there about T minus 10 or so.

Roger.

Apollo 9, Houston. You are looking good down here. You are GO for deorbit.

Roger. Houston, Apollo 9. We look pretty good from up here, too. And we're ready.

Apollo 9, Houston. About 1 minute LOS; the Huntsville at 14.

Roger. We'll see you at the Huntsville.

Roger.

Apollo 9, Houston.

Go ahead, Houston. Apollo 9.

Roger. Loud and clear, Jim. The helos are just now lifting off the flight deck of the carrier.

Houston, Apollo 9 here. I can't read you.

Roger. Nothing important. How now?

You are very weak, Houston.

Apollo 9, Houston through Hawaii. Standing by.
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<table>
<thead>
<tr>
<th>Time</th>
<th>Actor</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>MARK.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>Six minutes.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>MARK.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>Two minutes. You are looking good.</td>
</tr>
<tr>
<td>1000</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>1000</td>
<td>F</td>
<td>Sixty seconds.</td>
</tr>
<tr>
<td>1000</td>
<td>F</td>
<td>MARK.</td>
</tr>
<tr>
<td>1000</td>
<td>F</td>
<td>Thirty seconds.</td>
</tr>
<tr>
<td>1000</td>
<td>F</td>
<td>MARK.</td>
</tr>
<tr>
<td>1000</td>
<td>F</td>
<td>Fifteen seconds.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>10, 9, 8, 7, 6, 5, 4, 3, 2, 1.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>RETROFIRE.</td>
</tr>
<tr>
<td>1000</td>
<td>CMP</td>
<td>Houston, Apollo 9. Burn looks good up here.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>We're nulling residuals. The EMS DELTA-V was</td>
</tr>
<tr>
<td></td>
<td></td>
<td>minus 18.2.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>Roger. Minus 18.2, and we have the residuals.</td>
</tr>
<tr>
<td>1000</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>1000</td>
<td>CMP</td>
<td>Residuals are zero.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>9, Houston. High-speed tracking shows it's a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>good burn. Mighty fine.</td>
</tr>
<tr>
<td>1000</td>
<td>CMP</td>
<td>Roger. It felt good.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>9, Houston. I'll give you a time hack at 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>minutes.</td>
</tr>
<tr>
<td>1000</td>
<td>CMP</td>
<td>Standing by.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>MARK.</td>
</tr>
<tr>
<td>1000</td>
<td>CC</td>
<td>Three minutes.</td>
</tr>
<tr>
<td>1000</td>
<td>CMP</td>
<td>Thank you.</td>
</tr>
</tbody>
</table>
Apollo 9, Houston. You're looking good down here.

Roger, Houston. We're separated now, and we're moving our reflector up at this time.

Roger.

Apollo 9, Houston. I have a postburn update.

Plus 12501 25996 1525 1601, minus 03256, roll right 50 60 19 00; and I'll get the rest a little later.

Roger.

Apollo 9, Houston. I have time to begin blackout.

Go ahead.

1553 1928 2346 2433.

Okay. I'll read the whole thing back. 12091 25996 1525 1601, minus 03256, right 50/60 19 00 1553 1928 2346 2433.

9, Houston. Your readback correct.

Apollo 9, Houston.

Apollo 9, Houston.

Apollo 9, Houston.

ARIA, Houston CAP COMM. Go REMOTE.

Apollo 9, Houston through ARIA.

Roger. Apollo 9 here.

Roger, Apollo 9. We can barely read you.

... Apollo 9, Houston through ARIA.

Apollo 9, ready to read.
10 00 54 39  CC  Roger. Apollo 9, Houston. Go.

01 00 54 43  CDR  Okay. HUGS, 123.26, minus 68.01; and it looks like we're about a mile off.

10 00 54 50  CC  Roger. Real good. You ought to have chutes in about 10 seconds.

10 04 54 54  CDR  Okay.

10 00 59 01  CDR  Roger. Verified how do you read Apollo 9?

10 00 59 04  AE2  Read you loud and clear.

10 00 59 06  CDR  Roger. Doing pretty good. Have three chutes, and I'm already down to three here. Get that cake ready?

10 00 59 12  AB  This is AIR BOSS. I have three main chutes. They are drift free, approximately 2 miles from the command module, and its altitude is 2500 feet, approximately, at this time.

10 00 59 34  AB3  Apollo 9, Apollo 9, AIR BOSS. Over.

10 00 59 39  CDR  This is Apollo 9. If you read me, we won't need a second AIR BOSS. We're presently coming down through 2000.

10 00 59 43  AB2  AIR BOSS to 3.

10 00 59 45  AB3  Go ahead.

10 00 59 47  AB2  Roger. I am circling Apollo 9, and he is at 15.

10 00 59 55  AB3  Roger. I have you in sight, and we have had no contact with the command module.

10 01 00 01  CDR  Hello, AIR BOSS. This is Apollo 9, do you read me?

10 01 00 05  AB3  Apollo 9, this is AIR BOSS. Reception a little bit broken.

10 01 00 09  AB2  Apollo 9, AIR BOSS. We're getting you a little broken. Recovery 3 is circling you at this time. You're looking real good. Give me your status, please.

10 01 00 24  AB3  Roger. Understand. The crew is in good shape. Is that correct?
Apollo 9, this is AIR BOSS. We're not reading you. Check your propellant dump. Stand by.

SPLASHDOWN. This time! Jettison your mains.

Control, AIR BOSS. Parachute has been jettisoned. Capsule is reading stable I at this time. It looks good.