TRANSCRIPTION GUIDE

Speakers in the Apollo 7 Air-to-Ground Voice Transcriptions have been designated according to the following codes:

SPEAKERS

Command module:

CDR Commander Walter M. Schirra, Jr.
CAP Command module pilot Donn F. Eisele
LMP Lunar module pilot R. Walter Cunningham
EC Unidentifiable crewmember

Mission Control Center:

CC Command communicator (CAP COM)
F Flight Director (FLIGHT)
S Surgeon (surgeon or physician for the specific flight)

Remote sites:

CT Communications technician (COMM TECH)

One hyphen is used to indicate a speaker interrupting himself with another thought and then completing the statement. It is also used to indicate a pause. Two hyphens are used when a speaker does not complete a sentence, is interrupted, or completes a sentence after an interruption. If it was impossible to ascertain missing word(s), three dots have been used to indicate the garbled place.
IGNITION.

Lift-off and clocks running.

Roger. Godspeed, Apollo 7.

Clear of the tower.

Roll commence.

Roger. Roll.

Pitch is tracking good.


Roger.

Five thousand, 5 degrees.

Roll complete.

Roger. You're looking real good.

Roger. She's running - it's getting a little noisy now.

MARK.

Mode 1 Bravo.

Copy.

MARK.

Mode 1 Charlie.

Apollo 7, you are GO for staging.

Roger. We're GO.

You're looking good, 7.

Houston, do you read? Apollo 7?

Roger. Five-five, Wally. You're looking good; real fine.
... I couldn't receive you VHF.

Okay.

Tower jettisoned beautifully; did you read that?

Yes, we didn't get that, but we got GO.

Okay.

I'm reading him VHF now, Wally.

Okay.

I'll count you in on 4 minutes.

Okay.

Trajectory and guidance are GO, Apollo 7.

Roger. She looks real good. A little bumpy ride on this stage, but very pleasant.

Real fine.

On my MARK, it will be 4 minutes, Wally.

Okay.

Three, two, one.

MARK.

Apollo 7, systems are GO.

Roger. Looking real fine here, Walt.

Gimbals are tight.

Gimbal check looks very good.

This 1 g stuff is great.

Roger. Copy that.

It's right on 1 g.

Spacecraft guidance is GO.

Roger. You're looking real good. You're right on.
00 00 05 07  CDR  Roger.
00 00 05 51  CC  You're looking real fine, Apollo 7.
00 00 05 54  CDR  Roger. She's riding like a dream.
00 00 06 01  CDR  Six minutes, and we're really going.
00 00 06 04  CC  Roger.
00 00 06 05  CMP  This center-window view is sensational.
00 00 06 09  CC  You mean you finally got to look after the BPC went?
00 00 06 14  CMP  Man, that was a real fine ...
00 00 06 18  CMP  You'd think they raised a whole circus tent in front of us.
00 00 06 21  CC  Roger.
00 00 06 32  SC  Kind of dark on top, isn't it?
00 00 06 48  CC  You're right on the old button.
00 00 06 51  CDE  Very good.
00 00 06 58  LMP  Apollo 7 is GO at 7 minutes.
00 00 07 00  LMP  Omni ...
00 00 07 06  CC  You cut out there, Walt. Say again?
00 00 07 08  LMP  ...
00 00 07 22  LMP  ...
00 00 07 24  CC  You're kind of garbled, Walt.
00 00 07 29  CC  Apollo 7, Houston. How do you read?
00 00 07 32  LMP  Beautiful. How me?
00 00 07 34  CC  You're coming in very garbled.
00 00 07 38  CMP  Roger ...
00 00 07 41 CC You're also garbled, Donn. I can make it out;
you're right on the button, right on the mark;
you're looking good.

00 00 07 47 CMP Okay ...

00 00 08 05 CDR ... guidance is GO.

00 00 08 08 CC Okay. Copy guidance GO. We copy step press and
PU shift.

00 00 08 14 CDR ...

00 00 08 18 CDR ...

00 00 08 24 CC You're very garbled, 7. I'll just keep talking
to you; you're looking real fine.

00 00 08 29 CDR ...

00 00 08 59 CC You're looking real good, Apollo 7.

00 00 09 01 CDR ... in about a minute.

00 00 09 06 CC Roger. Copy.

00 00 09 16 CDR ...

00 00 09 20 CC I couldn't make it out, Wally, but you're
looking real good.

00 00 09 23 CDR ...

00 00 09 34 CC Apollo 7, Houston. Your trajectory and EMC
are GO.

00 00 09 39 CDR Beautiful. Roger.

00 00 09 44 CC We have a predicted SECO of 10 plus 20, 10 plus 20.

00 00 09 54 CC MARK.

00 00 09 55 CC Mode 4, mode 4.
00 00 10 08  CC  Omni Delta, Apollo 7.
00 00 10 19  CDR  SECO!
00 00 10 22  CC  Roger. Copy.
00 00 10 26  CDR  How do like that ...
00 00 10 28  CMP  Man, it felt like something shooting me clean out of the seat.
00 00 10 30  SC  Walter, I'll get the gimbals OFF.
00 00 10 34  CMP  Pitch 1 OFF, yaw 1 OFF, pitch 2 OFF, yaw 2 OFF.
00 00 10 40  SC  All four OFF.
00 00 10 42  SC  Beautiful.
00 00 10 46  CMP  Roger. Confirm DSKY readouts are velocity 25 553; H-dot is minus four balls 1; and altitude is 122.3.
00 00 10 59  CC  Roger. Copy, Apollo 7. We have you GO for orbit, GO for orbit.
00 00 11 15  SC  Go ahead, babe.
00 00 11 25  CC  Apollo 7, your S-IVB has been safed.
00 00 11 32  CC  Apollo 7, Houston. Are you reading?
00 00 11 41  CC  Apollo 7, Houston.
00 00 11 47  CMP  Let me read these off: apogee 146.4, perigee 122.3, off the DSKY.
00 00 11 57  CC  Apollo 7, Houston. We copy you perigee and apogee.
00 00 12 04  CC  How are you reading Houston?
00 00 12 21  CC  Apollo 7, Houston. Omni Delta, omni Delta.
00 00 12 39  CC  Apollo 7, Houston. How are you reading?
Read you loud and clear, Houston. How are we?

You're five-by now, 7. Your S-IVB has been safed. Stand by for your orbit.

Very good, sir.

Apollo 7, Houston. We have you in a 122 by 151 orbit.

That's very good.

Not bad shooting, right?

That's great.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Going to vent it?

Okay. I'll give you a GET time hack at 17 minutes and about 20 seconds.

Five, four, three, two, one.

MARK.

17 minutes GET.

Roger ...

Roger. You won't need a CMC lift-off update. You're okay there.

Roger ...

Apollo 7, say again.

Roger. How are we transmitting?
Okay. We're reading you about two-by; we're really trying to do some reconfiguring here to get good COMM with you.

...  

I can't make it out, Wally. Stand by.

Roger.

Apollo 7, Houston. How are you reading now?

...

Okay. You're loud, but very garbled, Wally.

Roger.

All your systems look real good down here.

Roger ...

I couldn't make it out. Do you want select Simplex A?

That's land out there, Little island down there that way: can you see it? Walt can, I guess.

Okay. Apollo 7, Houston. How do you read now?

Houston, Apollo 7. How do you read on Simplex A?

You're real fine now, real fine, Wally, and we've got you coming through on intercom.

That's clever.

Okay.

No, we're broadcasting to you.

Oh, okay. I was just wondering. I couldn't see what you were describing there.
00 00 20 14  CDR  We're looking at the Canary Islands.
00 00 20 15  CC  Oh, you're making me jealous.
00 00 20 20  CDR  Roger. We've completed the insertion checklist
                     with the exception of the four circuit breakers
                     of panels 277 and 278.
00 00 20 27  CC  Roger. We copy.
00 00 20 29  CDR  He hasn't posted this yet.
00 00 20 33  CT  It's loud and clear over here, Jack; good weather
                     report.
00 00 20 37  CC  Roger. You're five-by, also.
00 00 20 44  CDR  Just deserts.
00 00 22 50  CC  Apollo 7, Houston. You have about 2 minutes to
                     LOS, and your Saturn tanks look perfectly nominal.
00 00 22 57  CDR  Very good; they feel good.
00 00 22 59  CC  Roger, Boss.
00 00 23 40  CC  Apollo 7, Houston. Can you give us an onboard
                     reading of the S-IVB tank pressures?
00 00 23 45  CDR  Roger. Oxidizer is at 21; fuel is about 7.
00 00 23 59  CC  Roger. We confirm that, Wally. Looks about
                     the same here.
00 00 24 03  CDR  Roger.
00 00 24 03  CDR  TANANARIVE (REV 1)
00 00 40 28  CC  Hello.
00 00 40 29  SC  This is ... Apollo 7.
00 00 40 33  CC  Apollo 7, Houston. How do you read?
00 00 40 41  CDR  We read you, CAP COMM. Apollo 7 over Tananarive ...
Roger, Wally. We're reading you loud and clear. How do you read me?

CARNARVON (REV 1)

00 00 52 46 CDR Houston CAP COMM, Apollo 7 over Carnarvon.

00 00 52 49 CCR Roger. Apollo 7, this is Houston reading you loud and clear.

00 00 52 54 CDR Roger. Read you the same. We are having a ball.

00 00 52 56 CC Roger. We read you loud and clear over Tanana-rive, Wally, but evidently you could not read us.

00 00 53 02 CDR Fine, Tom.

00 00 53 03 CC Okay. We have new time for your LOX dump. The LOX dump --

00 00 53 08 CDR Wait a minute. Okay. Go ahead, Tom.

00 00 53 12 CC Roger. The S-IVB dump will occur at 1 plus 3½ plus 27, estimated DELTA-V of 32 feet per second.

00 00 53 25 CDR Did you get that, Walt?

00 00 53 27 LMP Roger. 1 plus 3½ plus 27, 32 feet per second.

00 00 53 32 CCR Roger.

00 00 53 35 CDR Do you read?

00 00 53 36 CC Roger. We got them.

00 00 53 38 CDR Okay. We've completed the postinsertion checklist down to where the CNP has to get out of the couch. Standing by for your GO/NO-GO.

00 00 53 45 CC Roger.
00 00 53 47 CDR I'd like to give you a little fast report on what we got here.

00 00 53 51 CC Go.

00 00 53 53 CDR The windows appear to be almost crystal clear — which is good news for all of us — and we have very good visibility out of all five windows. And in that center hatch one, there is a drain for monitoring boost.

00 00 54 09 CC Roger.

00 00 54 11 CDR We've noted the airglow here and made some data on it. It looks like it's about 3 degrees thick as we approached Carnarvon — at night, of course. We measured that with a COAS.

00 00 54 26 CC Roger.

00 00 54 27 CDR ... FOU's are still at 12 o'clock, ... arrived at 12 o'clock this trip.

00 00 54 35 CC You've seen me before.

00 00 54 37 CDR (Laughter) Roger. ... came into view 3 degrees before the top of the airglow, where that was the surface of the earth.

00 00 54 47 CC Okay.

00 00 54 49 CDR I'll see if Don and Walt have anything to pass on.

00 00 54 52 CC Okay. Stand by. May want to get you a NAV load right now for the GO/NO-GO. Stand by.

00 00 54 57 CDR Okay.
00 00 55 33 CC Apollo 7, Houston.
00 00 55 37 CDR Go ahead.
00 00 55 39 CC Roger. You have a GO, and guidance would like to send you an update.
00 00 55 46 CDR Roger. Stand by.
00 00 55 52 CDR Roger. We're in BLOCK; will go to ACCEPT on your call.
00 00 55 55 CC Roger. Go to ACCEPT.
00 00 55 58 CDR We are in ACCEPT. Understand we're GO for two one.
00 00 56 01 CC Affirmative.
00 00 56 02 CDR Roger. Jack, I'm observing your rewinded tape dump. We would like to get a good reading on GO/NO-GO on the DSE as soon as you can.
00 00 56 11 CC Okay.
00 00 56 16 CDR Total of LOX dump was 1 plus 34 plus 27, 37 feet per second.
00 00 56 22 CC Roger. We copy. Okay. It's coming up.
00 00 57 41 CC Apollo 7, Houston. The load is in, has been verified; the computer is yours.
00 00 57 48 CDR Very good.
00 00 59 47 C7 Apollo 7, Houston. One minute LOS Carnarvon; we pick you up Honeysuckle S-band almost immediately.
Okay. Jack, Donn is taking off his suit now; Walt's and mine are still on. We get an O₂ FLOW HI when Donn opens up the suit, and we analyze that as the suit rate trying to catch up to the cabin, so we are GO.

HONEYSLUDGE (REV 1)

Okay. We copy.

Okay. Jack, we've got the suit flow valve off now, and the O₂ flow is dropping down.

Okay. We copy.

No problem; it's just that we haven't seemed to be able to stop at the right thing.

Hey, Jack, are they going to be able to get the tape recorder rewound before we get LOS?

Stand by.

... for 6 minutes.

Okay. Apollo 7, Houston. We got the tape recorder rewound over the Canaries. We will do a dump over MILA.

Roger.

We would like to have a reading of just what you got on that tape, because we were talking on it continuously. ...

Okay. Will do. We'll do that over the state-side pass, Walt.
HUNTSVILLE through VANGUARD (REV 1)

00 01 24 23 CT   Huntsville AGS.
00 01 24 29 CC   Apollo 7, Houston.
00 01 24 41 CC   Apollo 7, this is Houston through the Huntsville.
   How do you read?
00 01 25 08 CC   Apollo 7, Houston. How do you read?
00 01 25 21 CC   Hello, Apollo 7, Houston. How do you read?
00 01 26 52 CT   Apollo 7 copied you loud and clear. Apollo 7
copied you loud and clear. Go ahead, and we'll
   relay.
00 01 27 00 CC   Roger. Apollo 7, this is Houston CAP COMM.
   Understand you are reading. Go ahead and relay
   through the Huntsville the S-IVB tank pressures;
   and again just to remind you, call program 47
   prior to the LOX dump.
00 01 28 20 CDR  Houston, Apollo 7. Do you read?
00 01 28 22 CC   Roger, Apollo 7. Reading you loud and clear. ...
00 01 28 26 CDR  Okay. The readings are 24-24, 13-13.
00 01 28 31 CC   Roger. Twenty-four and 13, Wally. Now reading
   you loud and clear.
00 01 28 34 CDR  Now we are turning on both A and B, and I have
   that logged.
00 01 28 37 CC   Roger.
00 01 28 39 CER   ... cough.
00 01 28 41 CC   Roger. Did you get me transmitting in the blind
   over the Huntsville, Wally?
I don't think so. What was that, Tom?

Well, I just - to read the tank pressures and to call program 47 prior to LOX dump.

Roger. We have that data. I have tank pressures at 1 plus 15, 1 plus 50 if you are ready to copy.

Roger. We got it.

23-23, 8 then 8. That's 1 plus 06.

Apollo 7, Houston. You faded out completely. We'll contact you over California in a couple of seconds.

Roger. ... data is logged.

Apollo 7, Houston.

Roger, Houston. Just coming over Baja California.

Roger. Everything looks good on the IVB back there, and you're GO for the dump.

Okay.

And also for the data, they plan to dump the DSE over KLA, and we'll have a real fast evaluation on the voyage.

Okay. Looks like Gueymaa is working pretty hard down there; we can see it. Tell me when you get that data on the S-IVB now.
You might tell Walt, what they did is they rewound the tape recorder over Canary, and if he has any additional voice that he wants to place on, he can place it on there now. They'll dump it again over MI&A.

Roger. Thank you.

Okay. They didn't get your remarks on booth because they rewound it over Canary, Walt, per the flight plan.

Okay. Well, all meter readouts were normal, and I did list them individually on the insertion text, and it's on the tape, and that's about the best we can do.

Okay. And we're standing by for the dump shortly.

Roger.

It's a fantastic world up here.

Apollo 7, Houston. We're reading your DSKY; looks like you're getting some DELTA-V.

Okay.

Apollo 7, Houston. The dump appears to be proceeding normally.
Good.

Apollo 7, Houston. Cold helium dump is initiated.

Roger.

Houston, Apollo 7. I have a PPO₂ for you. I'm reading 165.

Roger. A PPO₂ at 165.

Roger.

Houston, Apollo 7. Our cabin PRESS now is being very rapidly it seems to me, we're down to about 5.5.

Roger. 5.5 on the cabin.

Houston, Apollo 7.

Houston, Apollo 7.

Houston, Apollo 7.

Apollo 7, go.

Roger. Could you verify that the S-IVB pass position is complete?

Okay. Stand by, Wally.

I can stop program 47.

Roger. The passivation is complete, and you can terminate 47.

Roger. You have our readout on the DSKY?

We got it.

Okay. We won't bother logging it. We're waiting for an update on NAV stars for program 52.
00 01 48 30  CC  Roger.

00 01 48 32  CC  We're working on it right now.

00 01 52 18  CC  Apollo 7, Houston through Canary.

00 01 52 21  CDR  Roger, Jack. Loud and clear.

00 01 52 23  CC  Your stars for your P52 are stars number 2 and stars number 4.

00 01 52 34  CDR  Roger. Number 2 and 4. Thank you.

00 01 53 01  CDR  Roger. Here are the numbers; we have trouble pronouncing words ourselves.

00 01 53 03  CDR  Roger. Here are the numbers; we have trouble pronouncing the words ourselves.

00 01 53 08  CC  Yes.

00 01 53 27  CDR  We are preparing to jettison the optics cover shortly.

00 01 53 30  CC  Okay.

00 01 53 57  CDR  Jack, for the record, our DELTA-V counter read 33 feet per second.

00 01 54 01  CC  Okay. We got it all in the - that was the DELTA-V counter?

00 01 54 07  CDR  Affirmative.

00 01 54 08  CC  Okay.

00 01 54 10  CDR  We do a RESET now?

00 01 54 14  CC  Yes.
00 01 54 47 CC Apollo 7, Houston.
00 01 54 50 CDR Go ahead, Houston.
00 01 54 52 CC Roger. MILA reports your DSE voice quality on the dump was very good.
00 01 54 58 CDR Oh, good deal. That really helps.
00 01 57 01 CC Apollo 7, Houston.
00 01 57 04 CDR Go ahead, Jack.
00 01 57 05 CC Roger. One minute LOS Canary. We've computed a leak rate; we find it to be one half of spec value.
00 01 57 15 CDR Very good.
00 01 57 23 CDR The optics covers are jettisoned. Donn is tracking them.
00 01 57 28 CC Roger. Real good.
00 01 58 10 LMP Jack, let's get the ... temperatures ... much better around 70 ever since lift-off. I've never seen ... on what kind of ... expect them to do that ... couple of hours you'll get by ...
that's all.
00 01 58 32 CC Okay. Apollo 7, Houston. I couldn't copy that, Walt; you're down very low.
00 01 58 42 SC Going up.
00 01 59 00 CDR Did you set the cutoff ...
00 01 59 02 SC Roger.
00 01 59 08 CC I didn't copy it, either. The SPS tank TRMP's, I think. Isn't that what you got?
00 01 59 25  SC  I thought it was the SPS tank TEMP's. Didn't you?

Apollo 7, this is Houston through Tananarive.

How do you read?

00 02 12 18  CDR  Loud and clear, Tom.

00 02 12 19  CC  Roger. We're getting a lot of background noise on the HF coming in ... here, but you're coming in loud and clear.

00 02 12 26  LMP  Roger. You are putting through a lot of echo, but you are quite readable. We just ran through an Orion constellation, so we're very pretty.

00 02 12 36  CC  Roger. How do the stars look through both the telescope and sextant compared to the simulator?

00 02 12 43  LMP  A little bit better.

00 02 12 47  CC  Roger.

00 02 12 49  LMP  The Orion constellation came out ...

00 02 12 55  CC  Real good. Okay. We're going to give you a time hack at 30 minutes to go till separation in about 2 minutes.

00 02 13 04  CDR  Roger. I'll reset my dial.

00 02 13 07  CC  And we have a GET for the pitchdown maneuver and the inertial maneuver. Do you want to copy it?

00 02 13 14  CDR  Stand by. Roger. Tom, at ... clock we go ahead, and we have a blank for GET ...
Okay. G&T of pitchdown is 2 plus 42 plus 55;
G&T of inertial attitude, 2 plus 51 plus 10.
Pitchdown at 2 plus 42 plus 55, and inertial
at 2 plus 51 plus 10. And ... the SEP.
Roger. We're going to give you a 40-minute
back counting down so you can set your watch.
Okay. I'm all set here, Tom.
All right.
Thirty seconds to go.
Roger.
Five, four, three, two, one.
MARK.
Forty minutes, counting down for SEP.
Roger. Over here.
Roger.
We're going to try talking to you, and we'll
let you copy.
Go ahead.
Roger. First, we'll read off balls ... 0693
minus two balls 12 plus three balls 23 plus
00196; star difference angle was four balls 2.
Roger.
We had a terrible time ...
Apollo 7, Houston. What was your star angle
difference? That's the only one we were
questioning.
Four balls 2.

Not bad.

... Go cn to another ...

Roger.

We've got a real nice clean cabin here; very few particles floating around.

Sounds good.

There are two very small particles ...

Okay.

If we follow one more, we'll give it a cup of coffee.

(Laughter)

Apollo 7, Houston. You are 1 minute to LOS Taranarive; we will pick you up at Carnarvon in about 8 minutes.

Roger. ... got four balls 1 in circuit ...

Okay.

... two balls 22 plus four balls 6 plus four balls 1. This is the second go-around on the ...

Roger. Sounds good.

CARNARVON (REV 2)

Apollo 7, Houston.

Go ahead.

Roger. You won't need a state vector update.

I guess Donn did so good there - and you are GO for your S-IVB takeover.
00 02 27 35  CDR  Roger.
00 02 27 37  CC  And, Wally, after you get through with the S-IVB control test there, let me know when you ARM your LOGIC, and we'll take a look at it and give you a GO for PYRO AUX.
00 02 27 52  CDR  Okay, Jack.
00 02 28 48  LMP  Houston, Apollo 7.
00 02 28 50  CC  Go ahead.
00 02 28 51  LMP  We turned both cabin fans off about an hour ago because the noise is really terrific, and we just put one back on again to circulate some air, but the noise from both cabin fans is way up there.
00 02 29 06  CC  Okay. We copy.
00 02 30 54  CC  Apollo 7, Houston.
00 02 31 01  CDR  Roger, Houston. Go ahead.
00 02 31 03  CC  Wait, Wally. I'm sorry; we'll wait till you get through with this before we take over here.
00 02 31 07  CDR  Roger. We're right in it.
00 02 31 09  CC  I'm sorry.
00 02 32 04  CDR  The S-IVB is working very well, and we're now pitching up.
00 02 32 11  CC  Stop.
00 02 32 12  CDR  Did you get ... the stop?
00 02 32 16  CC  Roger. We copy.
00 02 32 19  CDR  Three, two, one.
00 02 32 21  CDR  MARK.
00 02 32 22  CDR  Minus roll ...
00 02 32 24  CC  And that's about ...
00 02 32 25  CC  Ninety degrees.
00 02 32 27  CDR  Up for 5 degrees.
00 02 32 28  CDR  Three, two, one.
00 02 32 30  CDR  MARK.
00 02 32 32  CDR  That's right on.
00 02 32 33  CC  Next will be thrust roll for 5 degrees. Three, two, one.
00 02 32 40  CC  MARK.
00 02 32 41  CDR  Roger. Coming back in.
00 02 32 45  CC  It's standing very well.
00 02 32 47  CDR  That's about five-tenths ...
00 02 32 48  CC  Three, two, one.
00 02 32 50  CC  MARK.
00 02 32 52  CDR  Very good.
00 02 32 54  CC  Minus yaw for 3 degrees.
00 02 32 56  CDR  Okay.
00 02 32 58  CC  Three, two, one.
00 02 33 00  CC  MARK.
00 02 33 02  CDR  Minus yaw, and that's three-tenths.
00 02 33 03  CC  Three, two, one.
00 02 33 10  CC  MARK.
00 02 33 11  CDR  Right on it.
00 02 33 12  CC  Touch off at 3 degrees. Three, two, one.
00 02 33 20  CC  MARK.
00 02 33 21  CDR  Roger. Coming on it.
00 02 33 25  CDR  There's much cross-coupling with this thing.
00 02 33 28  CC  Three, two, one.
00 02 33 30  CC  MARK.
00 02 33 31  CC  S-IVB test complete.
00 02 33 35  CDR  Beautiful.
00 02 33 36  CC  Real fine; outstanding. You want to hit your
logic down so we can lock at that?
00 02 33 48  SC  Second logic ON. LOGIC ON.
00 02 33 52  CC  Okay. We 'copy. And after Carnarvon here, which
we'll lose you in about 2 minutes, we are going
to do some remoting through ARIA to get - com-
plete this DTO.
00 02 34 03  CDR  Very good. Okay. S-IVB ...
00 02 34 12  CC  Okay.
00 02 34 14  CDR  Interesting sidelines: when the ...
00 02 34 20  CC  Okay. Apollo 7, you're GO for PYRO ARM.
00 02 34 24  CDR  There you are.
00 02 34 26  CDR  JV ARM.
00 02 34 29  CDR  We can see on the night side, the APS thrusting
on the S-IVB.
00 02 34 34  CC  How so?
00 02 34 36  CC  As a rule, flight's just like Gemini?
00 02 34 39  CDR  It's a pretty big blob of light; it's sort of a
yellow-orange light.
00 02 34 45 CC Roger.
00 02 34 47 CDR Okay. Pick up again.
00 02 34 49 CC This is Apollo 7. When you are dumping some of
our tapes, we'll be going live on some of these
things to make sure we've got complete coverage.

00 02 34 55 CDR Okay.
00 02 34 59 CC Direct RCS ON.
00 02 35 03 CDR That's ON.
00 02 35 06 SC Control RCS. "MAG modes all on RATE 2.
00 02 35 14 CDR RATE 2. SCS channels.
00 02 35 15 SC Four of them ON. Manual attitude, three of
them at RATE COMMAND.

00 02 35 25 CDR RATE COMMAND on three. Tape recorder - RECORD.
That's the ... stand by for their ... on that
... TDC servo power, AC 1, main A. Circuit
breakers EDS, three of them closed. RCS LOGIC
both closed: verified. EDS power ON. Okay.
DELTAV counter is zeroed.

ARIA 2 (REV 2)

00 02 36 10 CC ARIA 2, go REMOTE.
00 02 36 16 CC We called for CET to be reset here.
00 02 36 31 CC ARIA 2 has two-way lock; ARIA 2 has two-way lock.
00 02 35 41 CC Apollo 7 through ARIA. How do you read?
00 02 36 45 CDR Damn good, Jack; how are you?
00 02 36 47 CC ...

00 02 36 52 CC Okay. Wally, ARIA 2 has us for about 10 minutes
here; then we'll pick up ARIA 3 for about another 10 minutes.

Do you think you'll like those ARIA's there?

Jack, can you verify that the tape recorder will record for us, and we'll go to high bit rate for the S-IVB maneuver?

Okay. Stand by.

We're running through ARIA; you going to want me to go to high bit rate?

Okay. Apollo 7, FCOM tells me they will control it for SEP.

Understand. You will control it for SEP.

Hello, Apollo 7. This is Houston through ARIA 3. How do you read?

Very good.

Apollo 7, this is Houston through ARIA 3. Over.

... 

Roger. We can read you about one-by, Wally.

Apollo 7, Houston through ARIA 3. How do you read now?

... 

Roger. You're now coming in about three-by-three.

Apollo 7, Houston. How do you read now?
... Apollo 7, Houston.

Apollo 7, Houston. How do you read through ARIA 3?

Okay. Wally, you're about three-by. We have the PAD for the phasing maneuver. We'll send it up to you or give it to you through a ... whenever you are ready for it. We are not in any hurry, but whenever you are ready for it.

... LOS ...

HAWAII (REV 2)

Apollo 7, Houston.

Go ahead.

Roger. Through Hawaii. Minus 1 minute till SEP.

Houston, Apollo 7. Are we recording high bit rate?

Affirmative, Apollo 7.

Did you hear that on the ground?

No. You're saying it was loud, right?

Loudest sound heard round the world.

Okay. We confirm. SLA's up.

I can see a thruster firing action in daylight.

Roger. Copy.

I can see little tiny particles out the right-hand window way down; looks like pieces of chaff. I would assume that came from the separation of the S-IVB.
00 02 57 12  CC  Roger.  I understand.
00 02 57 26  CDR  I assume that she is still there then.  Tom,
we've got some old split ... when we pitched
out.
00 02 57 32  CC  Okay.  Looks like you are going straight in.
00 02 57 38  CDR  Same ...  It's absolutely beautiful here, and we
got a lot of loose particle chaff sitting at
about -
00 02 57 45  SC  Look at them!
00 02 57 49  LMP  Chaff seems to be oriented mostly between
3 o'clock and 5 o'clock from my point of view
here in the right seat and between 9 o'clock
and 12 o'clock.  The other two quadrants are
relatively clean; and the SLA panel at the top,
left, and bottom are opened at - I would guess
to be about a 45-degree angle, and the SLA
panel on the right is just opened maybe
30 degrees at the very best.
00 02 58 16  CC  Roger.  Looks like you are looking at a four-
jawed angry alligator.
00 02 58 28  CDR  It's a bigger one, Tom.
00 03 01 28  CC  Apollo 7, Houston.  Go ahead and get the EDS
power switch OFF if you want to.
00 03 01 56  CC  Apollo 7, Houston.
Hello, Apollo 7. This is Houston. Over.

Hello, Apollo 7, Houston. How do you read?

Roger.

Apollo 7, Houston. Over.

Roger. Houston, go. Apollo 7.

Roger. Everything going okay?

Yes, just fine. We've got a ... out there about a couple or 300 feet.

Okay. You might check your EDS power switch OFF, if you want to.

Switch is OFF. Have you got any kind of update for us for the SEP maneuvers?

Roger. We sure do. Are you ready to copy it?

Stand by for about 10 seconds.

Roger. Give me a call when you are ready.

Apollo 7. Go ahead with your update.

Roger. It's a phasing maneuver, 003 20 all balls NOUN 82 NA 1641 plus 1224 00057 32538 NOUN 48 NA zero plus 16; and roll, pitch, and yaw are 183, 299, 002, remarks: SEP, heads down, retrograde minus X thrusters. You should be in your retro-attitude by 3 plus 16 plus 30.

Roger. Understand. Upgrade for SEP maneuvers, 003, 20, 00, 1641, plus 1224, 00057, down retrograde minus X thrusters. You should be in your retroattitude by 3 plus 16 plus 30.
Roger. Understand updates for SEP maneuver.
003 20 00, 161, check 1224 00057 32538. NOW
you now on schedule; roll, pitch, and yaw 183,
299, 002. SCS heads down, retro, and use minus
X structures.

Roger. I copied, but I didn't get your pitch;
but I want to give it to you again. That's 299
for the pitch.

Roger.

Apollo 7, Houston.

Hello, Apollo 7, Houston.

Houston, go.

Okay. We expect some nonpropulsive venting up
near the front end of the S-IVB between 3 plus
08 and 3 plus 05. The booster will make a retro-
grade maneuver at 3 plus 16 plus 55.

Roger. Understand nonpropulsive venting between
03 08 and 03 09, and the booster will be retro-
venting at 03 16 55.

Roger. That's when the maneuver will be com-
manded. You should be able to see it maneuver
around.

Apollo 7, Houston. Confirm that your TVC serv
00 03 08 32  CDR  power number 1 is OFF.
It is OFF.
00 03 08 33  CC  Roger.
00 03 08 34  CDR  ...
00 03 09 18  IMP  There is quite a small-type debris still inside
the S-IVB. Is that GO?
00 03 09 29  CC  Roger. Copied that.
00 03 09 31  IMP  Seems to be coming out. That's probably the
vent.
00 03 09 38  CC  Okay.
00 03 10 32  IMP  All the internal structure looks just fine.
There is one set of cords that's running around -
one set of cords running around that seems to
be going to a panel that didn't open too far.
00 03 10 48  CC  Okay. Get some pictures.
00 03 13 38  CDR  We have got - Ponchartrain in the back of the
S-IVB. I can see the bridge right across it.
We should have a - unfortunately, it's too cloudy
for us to look at, Tom, but New Orleans looks
good.
00 03 13 54  CC  Roger. Understand you can see New Orleans.
00 03 13 56  CDR  Roger. We got a shot of the ... across the lake
cutting about.
00 03 14 01  CC  Roger. Good show.
00 03 14 41  CDR  Looks like the entire US is cloud covered until
you get over here, though.
We're looking right down at the Cape. We can get a picture of it in the background.

Roger. You got a picture of them over the Cape in the background.

The Cape's not clear.

Roger.

Now it's starting to clear.

Roger. You on top of the booster this time, Wally?

Say again.

You on top of the booster?

... we got some real great stuff here.

Good show. Okay. In about a minute, the booster should start its retrograde maneuver.

The booster is - engine is set up facing down toward the Atlantic Ocean - to straight down. We're pointing straight down.

Okay.

Got a very slow rate going on the booster.

Okay.

Except for that one panel, everything looks like it's just as you'd expect it to be on that S-IVB SLA deployment.

Okay. Sounds real good.

Okay. We've got about 3 minutes to go to the phasing maneuver, and are you all set up for the roll, pitch, and yaw?
00 03 16 58  CDR  We've ... and roll, and we ... attitude shortly.
00 03 17 03  CC  All right.
00 03 17 45  CC  Apollo 7, Houston.
00 03 17 47  CDR  Yes.
00 03 17 48  CC  Roger. Our - GNC just confirmed that inertial
  pitch attitude is 299 degrees.
00 03 18 55  CC  Okay. I'll give you a MARK at 60 seconds:
  two, one.
00 03 19 00  CC  MARK.
00 03 19 01  CC  T minus 60 seconds; minus 30 seconds; 10 sec-

00 03 19 29  CDR  We're in complete.
00 03 19 32  CC  Roger.
00 03 19 33  CDR  Roger.
00 03 22 49  CC  Apollo 7, Houston.
00 03 22 55  CDR  Houston, 7.
00 03 22 56  CC  Roger. You can go ahead and terminate pro-
  gram 47 if you want to.
00 03 23 00  CDR  Roger. We have terminated. We are trying to
  get a few more pictures after we set; we have made
  the burn one-tenth of a foot per second ...
00 03 23 07  CC  Roger. That's real good; thank you.
00 03 23 20  CDR  Tom, we had 47 running there a couple of min-
  utes early, and we picked up about a foot and
  a half per second and registered two. I guess
  you can pick that up on your downlink; you
might have somebody consider whether they want to re-do the state vector or not.

Okay. Good. Look, we're gonna have you at Ascension in just a couple of minutes, and we'd like to get a \( \text{PPO}_2 \) reading.

Okay. Stand by.

And also, what was your closest point of approach, Wally, to the IVI?

For about 4 or 5 feet, Tom.

Roger. Four or 5 feet.

... We're a little worried to get backed up in there with that one cocked panel, to drop things off.

Roger.

ASCENSION (REV 3)

Apollo 7, Houston through Ascension.

Go ahead, Houston.

Roger. We're standing by for your \( \text{PPO}_2 \) reading.

Roger. Our \( \text{PPO}_2 \) is reading 18 - oh, about 182 - 180, I guess.

Roger. Copy 182. Apollo 7, Houston. Could you read us out your reading for cabin pressure?

Roger. Cabin pressure is down to 5.2, I'd say - something like that.

Okay. Copy. Thank you.
Apollo 7, Houston through Tananarive. Standing by.

Apollo 7, Houston through Tananarive. Standing by.

CARNARVON (REV 3)

Apollo 7, Houston through Carnarvon.

Roger. Loud and clear.

You are loud and clear, also.

Houston, this is Apollo 7. I checked converter 3 on main B in AC bus 2; all phases normal. I checked converter 3 on main A, AC 1; all phases normal. To commence the ECS redundant component check, we need your cooperation for the manifold pressure readout.

Roger. We copy.

If you are ready on the ground, we are going to start checking our main regulator.

Okay. Apollo 7, Houston. We are ready to copy.

Main regulator D valve CLOSED. Emergency cabin pressure valve to one. Emergency cabin push-to-test pushbutton PUSH. O₂ FLOW vent HI. Can you give us a reading on the manifold pressure?

Roger. 105.

Thank you. Main regulator D valve OPEN; main regulator A valve CLOSED. Emergency cabin
pressure valve to 2. Emergency cabin push-to
test pushbutton PUSH. Okay. It's working. How
about a readout on this one?

00 04 04 36  CC  104.
00 04 04 38  LMP  Roger. 104. Main regulator A valve OPEN, Donn
00 04 04 43  CMP  Roger.
00 04 04 44  LMP  Emergency cabin valve CLOSED.
00 04 04 56  CMP  And we intend to ... our secondary radiators when
we get that far on this list.
00 04 05 02  CC  Roger. Copy.
00 04 05 06  CDR  We went a long period of time here with tape
voice and data phone. I think it would be good
if we go over the horizon, and you don't get
that thing back into an operating mode; let us
know if you can.

00 04 05 19  CC  Roger.
00 04 05 26  CDR  We're absolutely counting on being able to re-
cord this data on the tape.

00 04 05 31  CC  Okay.
00 04 06 13  CC  Okay. Apollo 7, Houston.
00 04 06 17  CDR  Go.
00 04 06 18  CC  Roger. We're not going to be able to finish the
dump here over Carnarvon, so you'll still be
barber pole to Hawaii. We'll finish the dump at
Hawaii then.

00 04 06 31  CDR  Roger. Understand. And in some cases, it would
seem that it would be desirable for us to go
chead and hit COMMAND RESET and get that tape
moving forward. So in order to avoid any con-
fusion in dumping, or in writing all this stuff
you haven't dumped, please let us know.

00 04 06 46 CC
Okay. Will do.

00 04 07 03 CC
Apollo 7, we're standing by for your PYRO A and
B volts checks.

00 04 07 10 CDR
Roger. We've pulled the circuit breaker; it was
reading 37 volts before we pulled each one.

00 04 07 15 CC
Okay. Batt C voltage.

00 04 07 20 CDR
PYRO A, 37; PYRO B, 37; and PYRO A sequence A
and PYRO B sequence B circuit breakers are out.

00 04 07 27 .C
Okay. Batt C voltage.

00 04 07 32 CDR
Batt C's reading 37. Do you read 37?

00 04 07 40 CC
All right; understand. Inverter phase voltages.

00 04 07 45 SC
All inverter phase voltages are nominal. I will
call nominal at 115 plus or minus 2.

00 04 07 50 CC
Roger. Copy.

00 04 07 52 CDR
Redundant inverter phase voltages all nominal
also.

00 04 07 55 CC
Okay.

00 04 10 06 CC
Apollo 7, Houston. One minute LOS Carnarvon,
and we have ARIA coverage here for another
10 minutes.

00 04 10 15 CDR
Roger. We are GO here.
ARIA 3 (REV 3)

00 04 11 00 CC ARIA 3, go REMOTE.
00 04 11 25 CT ARIA 3, ARIA 3...
00 04 11 32 CC Apollo 7, Houston through ARIA 3.
00 04 11 48 CC Apollo 7, through Houston through ARIA.
00 04 12 27 CC Apollo 7, Houston through ARIA. Standing by.
00 04 13 24 CT ARIA 3 to...
00 04 13 44 CC Apollo 7, Houston through ARIA 3.
00 04 15 00 CC Apollo 7, Houston through ARIA 1. Standing by.
00 04 15 17 ARIA 1...
00 04 15 35 ARIA 3 ARIA...
00 04 17 06 CC ARIA 3...

HAWAII (REV 3)

00 04 28 32 CT Apollo 7, Houston CAP COMM through Hawaii.
00 04 28 40 CDR Roger, Houston.
00 04 28 43 CC We're standing by.
00 04 28 45 CDR Aloha.
00 04 28 48 CC Aloha. Reading you loud and clear.
00 04 29 01 CC Apollo 7, Houston.
00 04 29 04 CDR Go ahead, Thomas.
00 04 29 05 CC Roger. Reading you loud and clear here. How's everything going?
00 04 29 10 CDR Very good. We're finishing off our first meal; I've had my first space cup of coffee.
00 04 29 15 CC You're eating the breakfast drink?
00 04 29 18 CDR They can't take it away from me, now.
00 04 29 21 CC Roger. Okay. Over the States this time, you're
going to get the NAV load, the state vector
load, and also the REFSMAT.

00 04 29 30 CDR Roger.
00 04 29 34 CC Later on, then, we'll call you up a maneuver
pad for the 5 dash 4 maneuver, for NAV check,
and also for data for that DRO on the day-night
retro check.

00 04 29 44 CDR Very good.
00 04 35 08 CC Apollo 7, Houston. Forty seconds to LOS. We
will have a - about a 3-minute loss of COMM here
since the Huntsville lost the voice. We will
pick you up over California about 36.

00 04 35 23 CDR Roger.

HUNTSVILLE through ANTIGUA (REV 3)

00 04 36 43 CC Apollo 7, Houston CAP COMM through to Huntsville.
How do you read?

00 04 37 16 LIM We can read you S-band. Go ahead.
00 04 37 19 CC Okay. Five-by, Walt. We just wanted to make a
voice check through Huntsville.

00 04 37 27 LIM Okay. Jack, if we have made all of these good
voice checks, I would like to catch up here
a little bit on our food.

00 04 37 33 CC Sure.
00 04 40 30 CC Apollo 7, Houston. If you will go to uplink
to ACCEPT, we will give you - send you the state
vector target load and REFSMAT.
00 04 40 57  CDR  Houston, check.
00 04 41 01  CC  Roger. We got it. Coming up.
00 04 41 28  CDR  Ready to copy the maneuver PAD whenever you have it.
00 04 41 32  CC  I don't.
00 04 41 32  CC  I don't have it yet, Walt. Stand by.
00 04 41 45  LMP  Jack, you can tell Chuck Arthur we've got a washer for him.
00 04 41 49  CC  Say again.
00 04 41 58  CC  Okay. I understand you have a washer for him.
00 04 42 00  LMP  That's correct. We got some for Huey, Peters, and Cochran.
00 04 42 09  CC  Okay.
00 04 42 26  LMP  We'll try to give you some more back.
00 04 42 55  CC  Okay.
00 04 42 57  LMP  You understand they did the tumble test in the plan?
00 04 43 03  CC  Roger.
00 04 44 50  CDR  Magazine M. Frame 50.

HUNTSVILLE through ANTIGUA (REV 4)

00 04 45 00  DR  Houston, at this time, at 04 44 32, we have shot frame 50 on 80368 magazine M.
00 04 45 17  CC  Okay.
00 04 45 21  DR  We had to call those out to you in real time; we can't record right now.
00 04 45 24  CC  All right.
00 04 45 43 CDR Houston, for the EMS bias check, add 1.6 feet per second in 5 minutes. Over.

00 04 45 54 CC Roger. How many feet per second in 5 minutes, Wally?

00 04 45 57 CDR ... six.

00 04 46 00 CC Roger. Understand, six.

00 04 46 03 CDR Negative. Unity six.

00 04 46 05 CC Roger. Got it.

00 04 46 12 CDR That's on the DELTA-V time.

00 04 46 14 CC Roger, Wally.

00 04 46 53 CC Apollo 7, Houston. All three NAV loads are in and verified. We are ready to pass up your maneuver PAD.

00 04 47 07 CDR Ready to copy. Go.

00 04 47 08 CC Okay. 6 dash 4 008 59 0843 minus 03194 plus all balls plus 03953 1530 minus 0370 04970 32460 minus 086 minus 030 0 plus 24 45 3590 332 008 17 all balls minus 2687 minus 03376 1631 180 180 000.

00 04 48 23 CDR Roger. Do you still read, Houston?

00 04 48 24 CC I read you five-by.

00 04 48 25 CDR Okay. Readback follows: 6 dash 4 008 59 0843 minus 03194 plus five balls plus 03953 1530 minus 0370 04970 32460 minus 086 minus 030 024 45 3590 332 008 17 0000 minus 2687 minus 03776 1631 180 180 000. Over.
Roger. There's a correction on your NOUN 43 longitude; that should be minus 03376.

Minus 03376. Roger.

Okay. And I'm ready on your manual retro attitude update.

Send 'em up.

On your remarks, Walt: for your six dash four update there, star check is not visible after 08 plus 40 plus 00.

Roger. 08 40 00 before then.

Roger.

And let me know when you're ready to copy that § 20.9 manual retro update.

Ready to copy. Go.

Okay. Read the - from top to bottom 6 plus 10, 6 plus 50; roll 179-180, pitch 138-341, yaw 360-359. The first one is a day; second one is a night.

Okay. Now I'll read back right across the top line: 6 plus 10, roll 179, pitch 138, yaw 360 day; second one is 6 plus 50, roll 180, pitch 241, yaw 359, night. Over.

Roger. That's got it.

Apollo 7, the phasing maneuver that we did will put us 82 miles in front tomorrow for the rendezvous.
Roger. I understand. Eighty miles in front tomorrow.

Eighty-two.

Eighty-two miles.

Houston, Apollo 7.

Go ahead.

You've had a report on our constellation Orion already, have you not?

No, I've had no affirmative report.

No strain; it worked well.

Okay. Real fine.

...

Roger.

Apollo 7, Houston.

Go ahead.

Roger. G\&N say we are getting close to gimbal lock.

We have an eyeball on it.

We don't seem to be generating any IVA maneuvers that the spacecraft's responding to.

Roger, Wally. One thing we're interested in: how is Donn doing down in the LEB with respect to working the NAV gear? Do you have any trouble for a position?

At about two GDI's, that's all.

Understand, 13.
The floor doesn't seem to hold me down very well, and it may be because of the strip that's in the hose that keeps carrying me toward the other end; so I'll find c.t a little better, I think, after I get the suit off later, if I do that.

 Okay.

 And the PPO₂: I gave that to you at 04 40, and it was 165.

 Roger. We copied that. What about the PIPA bias check?

 We had to stop that when we took your update; we'll start another one shortly.

 Okay. Real fine.

 Good.

 For your information, we have finished one meal.

 Copy. One meal.

 Apollo 7, Houston. Opposite omni.

 Apollo 7, Houston. We are through with the computer; you can go to BLOCK on the UFTEL switch if you'd like.

 Roger. BLOCK.

 We're doing our secondary coolant loop check now.

 Okay.

 You're about 30 seconds from LOS; we will pick
y... and up over Ascension in about 6 minutes.

ASCENSION (REV 4)

00 05 07 51 CC Apollo 7, Houston through Ascension. Standing by.

00 05 07 57 CDR Roger. We were noticing a little bit of fogging on the hatch window.

00 05 08 05 CC Roger. Copy.

00 05 08 07 CDR And we've taken a couple of pictures of it. ... apparently all right.

00 05 08 16 CC Okay. Copy that.

00 05 08 21 LMP We're flowed the secondary radiators and temperature came down right smartly. We've turned on the secondary cool lift pump, and it's OFF; and the glycol aft outlet temperature came right on down, overshot to about 35 and seems to be controlling around 40. There was depresssure 12.

00 05 08 42 CC That sounds real good, Walt.

00 05 08 48 CMP Fogging on the center hatch windows on the ...

00 05 09 00 CMP Checking condensation.

00 05 09 33 CDR Temperature is staying about, oh, call it 55, make it 65; and the glycol evap outlet temperature climbed right on up to, oh, 58, something like that. Makes me wonder about the mixing valve working.

00 05 09 48 CC Roger.
00 05 13 08       CC       Apollo 7, Houston. About 40 seconds to LOS Ascension; we'll pick you up in about 18 minutes over Carnarvon.
00 05 13 20       SC       Roger.

TANANARIVE (REV 4)
00 05 24 44       CC       Apollo 7, Houston through Tananarive.
00 05 25 41       CC       Apollo 7, Houston through Tananarive.

CARNARVON (REV 4)
00 05 38 46       CC       Apollo 7, Houston through Carnarvon.
00 05 38 50       CDR      Roger. Loud and clear.
00 05 38 51       CC       Roger. Loud and clear, also. 7, when you went over the hill, we found your secondary cooling loop was working satisfactory, and everything looked good on the primary loop, also.

00 05 39 08       CDR      Roger. We concur.
00 05 39 10       CC       Okay.
00 05 39 12       IMP      Did our secondary radiator again. We should not have to pull it again for the rest of the flight. The egress began - ECS redundant component check was completed satisfactorily. I still feel like there's slightly anomalous behavior there on the mixing valve possible on the primary loop. The glycol evap outlet temperature was running at 58 when I turned off the evaporator.
Roger. Copy. Walt, John Aron is shaking his head.

Roger. We did check the glycol EVAP TEMP end valve on the cooling panel, and it was a MIN heat, so there's not much more that can be done there.

Roger.

Apollo 7, Houston.

Go ahead.

Walt, we just want to talk over on that primary loop. Was the primary loop running when you read the 58 degrees; was it in operation when you read an EVAP OUT of 58 degrees?

When I first read it, it was not pumping, but then it still was at 58 till I turned the evaporator on. There wasn't a great deal of time there between when I turned the pumps back on the primary loop and went to EVAP, so maybe it just didn't get a chance to settle down.

That might be. Okay.

Your primary loop is working okay now, Walt?

That's affirmative.

It's working very fine since lift-off. I would estimate we've been boiling to some extent most of the time.
00 05 41 59 CC Okay.
00 05 42 02 IMP We've run through urine dump operations twice, and it seems to be dumping fine, so far.
00 05 42 09 CC Okay. Real fine.
00 05 42 15 CMP Jack, this is Donn. I completed that alignment at the beginning of this pass. I used Navi and Alpheratz, and we had five balls on the star difference, and I went through to fine align just to be sure. On the coarse align, we had about half a degree and 2 and 1/2 degrees on the gyro torque and angle.
00 05 42 40 CC Okay. Copy, Donn.
00 05 42 46 IMP Do you want to go ahead with the hydrogen purge check heater coming on at 05 50?
00 05 42 52 CC Roger.

GUAM (REV 1)
00 05 50 26 CC Apollo 7, Houston through Guam.
00 05 50 29 CDR Roger. Read you loud and clear.
03 05 50 32 CC You're five-by.
00 05 56 20 CC Apollo 7, Houston. One minute LOS Guam.
00 05 56 24 CDR Roger.
00 05 56 25 CC And, Wally, we're planning - because of - we had this COMM problem during launch; we would like to do a VHF Duplex L check over stateside pass, sometime after you do the day retro test, and we'll talk you all through it.
Okay.

We'll just do it one time only, and that's it.

Roger.

HAWAII (REV 4)

Apollo 7, Houston through Hawaii.

Roger.

Wally, we would like to have you do a PO - PPO, 2 check whenever you get a chance, the reason being that the second one was a little shaky.

... Roger. It was the same as the one before.

We were using the elbow that bleeds the cabin down in order to vent the unit line, and we ended up not purging the cabin there for a period of about one rev, and now I am reading about 170 mm. I got another little problem here. The O₂ flow has gone high about, oh, 3 minutes ago; it's still pegged on high.

Roger. Copy. Copy PPO₂ 172.

Roger. At 6 hours 7 minutes into the mission, I took the magazine M frames 53 and 54: a tropical storm.

Roger. We copy.

Apollo 7, Houston.

Houston, Apollo 7.

Roger. Walt, we are concerned about that O₂ flow high. Have you still got it? And if so
are you starting it through the malfunction procedure?

00 06 08 45 IMP That's affirmative. And I'm on page 52 - about 42 here, the cabin seems to be holding high - I mean holding fine; it's normal. I have switched to REDUNDANT, cycled the accumulator with no effect, and I have cycled several times each water accumulator ON and OFF.

00 06 09 06 CC Roger. We copy.

00 06 09 43 CDR ...

00 06 10 49 CC Apollo 7, Houston. Are you calling?

00 06 10 50 CDR That's affirm.

00 06 10 59 CC Houston, Apollo 7. Go ahead.

00 06 11 00 CC Stand by.

HUNTSVILLE through ANTIGUA (REV 4)

00 06 11 27 CC Okay. Houston, Apollo 7, this is Houston. You're over the Huntsville how, Wally; do you read? The voice data is coming in very garbled. We'll pick you up loud and clear over California in just about a minute.

00 06 11 23 CDR Houston, Apollo 7. Over.

00 06 11 25 CC Roger. Apollo 7, Houston. Read you five-by.

00 06 11 29 CDR Roger. That's your trend data shown on cabin pressure? We show it holding. Do you show it increasing at all?

00 06 11 39 CC Roger, Apollo 7. We show it holding also, not
Page 51

increasing.

00 06 14 43 CDR Thank you.

00 06 15 33 CC Apollo 7, Houston.

00 06 15 35 CDR Go ahead, Houston.

00 06 15 37 C: Roger. Your COMM was garbled over the Huntsville, Wally; and you were trying to read down today retro check. Didn't that fix go okay?

00 06 15 45 CDR Negative.

00 06 15 46 C: Roger.

00 06 15 47 CDR Say, have them call in these times.

00 06 15 49 C: Okay.

00 06 15 51 CDR And all, at 6 hours 10 minutes 22 seconds. Was the bottom of the lines on the canthrim, and was the COAS set at 31.7, also? Matched up perfectly, at 134.7 degrees in pitch.

00 06 16 17 C: Okay.

00 06 16 19 CDR I'd like to revalidate that time.

00 06 16 26 C: Okay.

00 06 16 28 SC Like to revalidate that time.

00 06 16 32 C: Okay. We got that data.

00 06 17 12 CDR Roger. It is flush from 3 degrees, but we should do better.

00 06 17 26 CC Instead of 138.

00 06 17 32 CDR Say again.

00 06 17 56 CC I am sorry, Wally. That was my error.
00 06 18 06 CDR  Roger. What's with the end of eight?
00 06 18 29 CC  Well, we read you up 138. We are just going
through it now, trying to find out what the
difference is.
00 06 18 44 CDR  3.3 degrees.
(RED) through ANTIGUA (REV 5)
00 06 20 12 LMP  Houston, Apollo 7. Any ideas on the O₂ FLOW
HI? We are still bleeding the cabin out.
It doesn't seem like that could possibly account
for that much, but that is the only leak we can
account for.
00 06 20 23 CC  Wait, we are still going through it.
00 06 20 25 CC  Right now, we are kind of thinking it is a sen-
sor failure.
00 06 20 35 CC  We will take a look at it a little bit further
as we go along and let you know.
00 06 20 42 LMP  Roger.
00 06 24 43 SC  Six hours and 24 minutes into the flight, I
took frames 55 and 56 on magazine H looking
at several islands in the ocean.
00 06 24 57 CC  Roger. Copy.
00 06 26 02 CC  Apollo 7, Houston.
00 06 26 04 CDR  Go ahead.
00 06 26 06 CC  Roger. On the O₂ flow problem: we've looked
it over pretty well. We can't see anything
that would cause high O₂ flow. Surge tanke
holding well, cabin is not increasing, so we kind of had the feeling it's probably a sensor failure.

00 06 26 22 CDR Roger.
00 06 26 23 C: And we have some corrections on that manual retroattitude, the one you are going to do at 6 plus 50.
00 06 26 31 CDR Roger. Go ahead.
00 06 26 33 C: Okay. It is pitch attitude. Pitch attitude should be 339, and yaw attitude should be 000.5.

ASCENSION (REV 5)

00 06 44 19 C: Apollo 7, Houston through Ascension.
00 06 44 34 C: Apollo 7, Houston.
00 06 44 36 CDR Go ahead, Houston.
00 06 44 37 C: Roger. Wally, we're still showing a good cabin, and everything seems to be holding fine on the ECS there.
00 06 44 45 CDR Looking good.
00 06 44 50 C: You are about 1 minute LOS Ascension. Will pick you up at Tanganarive.
00 06 44 55 CDR Roger.
00 06 46 06 CDR Houston, Apollo 7. Over.
00 06 46 08 C: Apollo 7, go ahead.
00 06 46 11 CDR May I have an orbital update first chance you get?
00 06 46 16 C: Apollo, would you repeat? You're garbled.
00 06 46 20 CDR Requesting orbital map update first chance you get, please. Over.
00 06 46 23 CC Roger. Will do.

TANANARIVE (REV 5)

00 06 58 12 CC Apollo 7, Houston through Tananarive.
00 06 58 20 CDR Houston, do you read? Apollo 7.
00 06 58 22 CC I read you five-by. How me?
00 06 58 25 CDR Read you the same. Check we are right on earth limb. The airglow is 2.8 degrees thick during that check. The COAS is a better-

00 06 58 54 CC Apollo 7, Houston. You faded on that last one, after the comment about the COAS.

00 06 59 12 CC Apollo 7, Houston.
00 06 59 37 CC Apollo 7, Houston.
00 07 01 15 LMP Houston, Apollo 7.
00 07 01 17 CC Apollo 7, Houston. We read you five-by, now.
00 07 01 21 LMP Roger. I assume you are monitoring my purge and-

00 07 01 25 CC Roger. I understand you're making a fuel cell purge.
00 07 01 28 LMP Roger. Check it out.
00 07 01 33 CC I didn't get it, Walt; say again.
00 07 01 36 LMP I'm in the midst of a fuel cell purge. I've done one on hydrogen fuel cell 2, and fuel cell 3 to follow.
Roger. Copy. I can give you some – an update on your orbital map here.

Roger. Standing by; go ahead.

Okay. For REV 5, the node – the time of the node will be 07 plus 17 plus 38. Longitude of the node will be 106.5 degrees east.

Roger. 106.5 east, 07 plus 17 plus 38.

Roger. And the right ascension will be 06 plus 49.

Say again.

The right ascension will be 06 plus 49.

Okay, 7 – Wally, you faded out on when you were describing the night retro check; we didn't get your comments on the COAS.

Roger. I set the COAS for 31.7 degrees. It was more readily usable than the window align for that retro.

Okay. Roger. Okay. Real good. Was the basic data correlated pretty well for the night retro, Wally?

Affirmative. It looked real good on the earth horizon.

Okay. That's what they're shooting for. We'll talk to you over Guam about the day retro check and the discrepancy there.
00 07 03 25 CDR  Roger.
00 07 03 31 CC    And, Apollo 7, we plan to do that Duplex V check 
                 just as we start Guam there.
00 07 03 37 CDR  Roger.
00 07 04 24 CC    Apollo 7. You are 1 minute LOS Tananarivo; 
                 pick you up in Mercury in about 18 minutes.
00 07 04 30 CDR  Roger.
00 07 22 30 CC    MERCURY (REV 5)
00 07 22 34 CDR  Apollo 7, Houston through the Mercury. How 
                 do you read?
00 07 22 36 CC    Roger. Read you loud and clear.
00 07 22 43 CDR  Roger, Wally. You're five-by. How's the 
                 spacecraft systems status?
00 07 23 06 CDR  We are in pretty good shape. We detected a 
                 continual yaw which we suspected before we 
                 started to fly. I'll give you some data on 
                 that. The control mode is SCS attitude HOLD, 
                 MAX deadband, high rate, limit cycle is ON.
00 07 23 09 CC    At 7 hours 17 minutes and 3 seconds, yaw was 
                 plus 007.10. At 17 hours 18 minutes and 
                 56 seconds, yaw was plus 007.82, and it cycles 
                 back and forth between those kind of numbers 
                 at that rate.
00 07 23 33 CC    Okay. We copy.
00 07 23 35 CDR  We are knocking on the plus yaw side of the 
                 deadband.
00 07 23 40  CC  Roger.
00 07 23 43  CMP  The other systems are GO with the exception of
the - well, we seem to have the O² full high
come off the peg.
00 07 23 52  CC  How so?
00 07 23 55  CMP  Must have been a stuck valve.
00 07 23 58  CC  Did you use the BARDOL procedures?
00 07 24 02  CMP  We used BARDOL procedures, but that was like
an hour ago.
00 07 24 06  CC  Roger.
00 07 24 08  CMP  And water accumulator auto 1: the flowmeter
looks sluggish, and it's reading about .75 -
make that about .8. The light is out.
00 07 24 23  CDR  It is decreasing; it must be a winner.
00 07 24 26  CC  Roger. Do you have any other systems problems?
00 07 24 32  CMP  Donn solved his urine dump system problem.
00 07 24 38  CC  Roger. Copy.
00 07 24 40  CDR  That sounds like a personal problem.
00 07 24 42  CMP  Yes, it was.
00 07 24 47  CC  Does the spacecraft look good for about 18 revs?
00 07 24 51  CDR  Eighteen revs a day.
00 07 24 53  CC  Okay.
00 07 24 54  CDR  We're ready to move to fast time right now.
00 07 24 58  CMP  How about going back to MSOB and starting over
tomorrow?
00 07 25 30  CC  Apollo 7, Houston. You are GO for 18 dash 1.
That suits us.

Real fine. Tom has got a question here for you.

Go ahead.

Okay. Wally, just want to hack out real fast on that one retro check. The night retro check came out real good, and the retro wants -

John wants to ask you one question here. On a daylight check, when you came up to the 6 hours and 10 minutes, you read 134.7 at that time?

That is affirmative. We were 20 seconds late with the check because it was so far off, and I was trying to bring it in.

Okay. Well, we do have some NNAV vectors. They can account for a 1.4 difference, and it looks like what they would like to do is - down the road sometime is run another one.

Okay. Let us do a little more homework on it, and we'll use the fuel.

Okay.

Those are kind of expensive.

Sey again, Wally.

Those are kind of expensive to use as fuel.

Yes, we agree completely and said the night check came out good, and - well, they can account for half of that difference due to a vector.

Apollo 7. Opposite omni.
Apollo 7, Houston. We would like to shift over to Duplex B for a radio check.

Okay. Opposite omni on S-band first.

Apollo 7 on Duplex B. How do you read? Over.

Okay. Stand by until we can get reconfigured with the site here, Walt.

I'm already switched. How are you - oh, you're reading me S-band?

GUAM (REV 5)

Okay. We're real good. We read you Duplex B real fine.

Roger. I'm reading you five-by-five. Do you read me Duplex B?

Five-by. Stand by one.

Okay. Apollo 7, you can go back Simplex A. The voice check was real good.

Apollo 7. Simplex A. How do you read?

You're five-by.

Likewise here.

We got our O₂ FLOW HI back.

Roger. We see it. And you've got 1 minute LOS Guam; pick you up on Hawaii in about 8 minutes

Roger. And we had a successful purge, both hydrogen and oxygen, all three fuel cells.
Looking ahead, I see vent batteries at 8 hours. We did that as part of our postinsertion check-list.

00 07 30 19  CC  Roger. Copy.
00 07 30 51  SC  The systems test meter position 4A went down to 0.60. That's as low as it went on the vent.
00 07 30 58  CC  Roger.

HAWAII through GUAYMAS (REV 5)

00 07 39 45  CC  Apollo 7, Houston.
00 07 39 48  CDR  Go ahead.
00 07 39 50  CC  Okay. Through Hawaii now. One thing GNC wanted to check on: they got a bit of a TM that showed you had a restart. Have you had any RESTART lights on your computer?
00 07 40 01  CDR  This is 7. That was in a routine we've done. We did zero optics, and we found from zero optics - we thought everything was okay, which would be capable because of the low rate in the lighting.
00 07 40 17  CC  Okay. You're kinda garbled. I understand you did have one to reset and looks like all the erasable is real fine.
00 07 40 25  SC  ...
00 07 51 25  CC  Hello, Apollo 7, Houston.
00 07 51 27  CDR  Roger, Tom. Go ahead.
Okay. Got good COMM with you now, Wally. Just wanted to recheck on the computer. When you did - did you get the alarm light at the same time that the RESTART - program alarm at the same time that the RESTART came on?

That's affirmative. We've wrote that off as no problem, Tom.

Okay. But you did get a RESTART and a program alarm about the same time?

That's affirmative. That was due to the zero optics. The gage swung too fast.

Okay. One item I want to - we're starting to track the S-IVB, and it's not separating as fast as they had anticipated. It's going to take a while to track it out, and then we'll have plenty of time on it.

Okay.

TANANARIVE (REV 6)

Apollo 7, this is Houston through Tanaarive.

Roger, Houston. Go ahead.

Roger. We're just standing by here. One item of interest: the hydrogen and oxygen purity is lots higher than predicted. It looks like the next purge that will be required will be some time after 40 hours.

Roger. We'll stand by for the update; and since confession is good for the soul, one of those
hydrogen purges ran a little better than 2 minutes last time.

00 08 33 54  CC  No problem.
00 08 35 13  IMP  This is IMP. I want to log 20 squirts of water gun at 8 hours and 35 minutes into the flight.
00 08 35 31  CC  Apollo 7, Houston. Roger. We copy.
00 08 35 38  SC  We're using you for real-time logging whenever we have our DSR out of commission temporarily.
00 08 35 46  CC  Okay.
00 08 38 49  SC  Houston, this is Apollo 7. Do you have the good team on yet?
00 08 39 02  CC  Apollo 7. Say again.
00 08 39 08  SC  Sounds like you've got the good team working there.
00 08 39 21  SC  Yes. That's affirmed.
00 08 39 31  SC  We had a beautiful trip. I tried to contact you, but no go.
00 08 39 45  CC  Apollo 7, Houston. We have 1 minute to LOS Tananarive.
00 08 39 53  SC  Roger.
00 08 43 36  CT  Voice control, Tananarive.

MERCURY (REV 6)

00 08 55 51  CC  Apollo 7, Houston through Mercury. How do you read?
00 08 59 31 CC Apollo 7, Houston through Mercury.
00 08 59 38 LMP Roger, Houston. Go ahead.
00 08 59 39 CC Roger. You're coming in loud and clear. Just
wanted to check - have you got all the basic
stowage squared away, Walt?
00 08 59 47 LMP Seems like we have. We're up to that stage in
the flight plan where we kind of collect
our housekeeping wits. Donn is attempting to
settle down for a long winter's night.
00 08 59 59 CC Okay. Thank you.
00 09 00 34 CC Apollo 7, Houston. Opposite omni.
00 09 00 46 LMP Roger. I switched, but I showed a better lock-up
on omni A which I had before. It's back up now.
I still have the O₂ FLOW HI light. We've oc-
casionally had the flowmeter come on down to
around .8, but it's a very sluggish movement.
I would appreciate it if, as soon as you get
any kind of trend data on the option quantity,
you'll let us know, and it'll really confirm
the transducer problem.
00 09 02 22 LMP Houston, this is 7. Over.
00 09 02 26 CC Houston. Go.
00 09 02 30 SC We have block data on board up through REV 8,
and we'll be standing for further update on
block data at your convenience.
00 09 02 38 CC Houston. Roger.
00 09 02 45 CC Apollo 7, Houston. Let's try opposite omni again.

00 09 02 58 LMP This one looks a little better to me, but not too good. I'm going to try in between if you'd like. I can kind of tell here on the single straight meter. That's negative. Omni A seems to be best from here.

00 09 03 26 CC Roger. Thirty seconds to LOS and okay for omni A.

00 09 16 19 CC Apollo 7, Houston at Hawaii. Over.

00 09 16 23 CDR Roger. Reading you five-by.

00 09 16 26 CC Roger. Good news tonight. There's no EKG on a CMP or the LMP.

00 09 16 34 LMP Thank you very much (laughter). I'll tell the CDR.

00 09 16 39 CC Since the CMP is asleep, don't bother him; but we've got some checks we want the LMP to do.

00 09 16 46 LMP This is the LMP. Go on the checks.

00 09 16 50 CC Roger. Check that the sensor that goes into the lower end of your breast bone - there right in your chest - is plugged in the line. Check that the sensor - the external sensor - is plugged into the box and is tight. And then when you're done with all that, if it doesn't make up, check that the sensor is strapped to the body. And -
00 09 17 22 LMP I found one sensor that was loose. It was the upper one - the upper sternum.
00 09 17 27 CC Roger.
00 09 17 35 LMP How are you reading me now?
00 09 17 38 CC Loud and clear.
00 09 17 40 LMP How's my EKG, I mean?
00 09 17 45 CC Nothing yet.
00 09 17 49 CCR That's it.
00 09 17 54 CC That fixed it, LMP.
00 09 17 57 LMP Sorry about that.
00 09 18 04 CC Opposite omni, please.
00 09 18 33 CC Apollo 7, Houston. I have a block data on number 2 to give you.
00 09 20 17 CC Apollo 7, Houston.
00 09 20 20 LMP Go.
00 09 20 22 CC Roger. Both the last two stations confirm that you have been transmitting on both Simplex A and B. Do you concur?
00 09 20 35 CDR That's affirm. We're now on Simplex A.
00 09 20 38 CC Roger. We're about 1 minute to LOS. I'll have your block data for you over Tananarive if the voice is good; otherwise, on around.
00 09 20 55 CDR Roger. We'll be standing by.

      HUNTSVILLE through GUAYMAS (REV 6)
00 09 23 03 CC Apollo 7, Houston.
00 09 24 11 CC Apollo 7, Houston.
00 09 25 16  CC  Apollo 7, Houston. One minute to LOS. In the blind, up-telemetry command switch to RESET and release.

00 09 25 27  SC  Roger. Are you reading the S-band as coming real low, and say again all after LOS?

00 09 25 33  CC  Roger. Up-telemetry command switch to RESET.

00 09 25 50  CC  Apollo 7, Houston. Return the up-telemetry command switch to NORMAL.

00 09 25 58  SC  You're coming in way down in the mud. Do you want the up-telemetry?

HUNTSVILLE through GUAYMAS (REV 7)

00 10 07 50  CC  Apollo 7, Houston.

00 10 09 03  CC  Apollo 7, Houston.

00 10 09 09  CDR  Go ahead, Houston.

00 10 09 11  CC  Roger. You sound pretty good this time.

00 10 09 15  CDR  Roger. We're changing our ... canister at this time.

00 10 09 19  CC  Roger.

00 10 09 24  LMP  Houston, this is Apollo 7 again. Well, about 25 minutes ago, I guess, we noticed our glycol evap outlet temperature was climbing above 50, and the steam pressure was pegged low. The best ... above 60; we went to MANUAL and increased for 45 seconds, and we started to activate the secondary loop. Before we got the secondary loop completely activated, in about 10 minutes,
the temperature started down again, and there
was no noticed activity for a couple of minutes;
but it looks like the water boiler valve just
might have frozen, and now it seems to be con-
trolling fine back in AUTO.

Apollo 7, Houston. We copy.

Roger. And I am in the midst of changing the
lithium hydroxide canister. Would you verify
it for me from the ECS people how long this
button should have to be depressed preventing
the canister prior to opening? It seems to
be on a continual ...

Roger. Stand by.

You don't even need to press a button there,
Walt.

Apollo 7, Houston. That's just a momentary
depress on that canister.

Roger. That's what I understood, but I think
it must be for ... operation; it works all right
now.

Walt, we would like to verify that you reset
your up-telemetry command switch and then it
went back to normal.

Roger.

Apollo 7, Houston. Request a partial pressure
$O_2$ reading.
Houston, this is Apollo 7. We took and changed the canister out of the A side board on the ground that we had inadvertently placed canister 2 in there. I switched canister 2 down to site B and removed canister 1, and canister 2 is now where it belonged in the first place.

Apollo 7, Houston. That's Roger.

Roger. We need your partial pressure O₂ reading Wally, and also your status of the waste management overboard drain valve.

Roger. You got the ... reading is 190 when you requested it - at about 10 15.

Say again the reading; I missed it.

One nine zero.

Roger. Cleared to go ahead and close the waste management overboard drain valve ...

Thank you.

The one you already closed at 10 15.

Negative ...

Apollo 7, Houston. I've got some block data to give you.

Send it up.
Roger. Block data number 2 009-3 Bravo plus 254 plus 1357 013 plus 29 plus 36 5150, 010 Alfa Charlie minus 054 minus 0162 014 plus 19 plus 12 4314, 011 Alfa Charlie plus 060 minus 0220 015 plus 51 plus 48 4131, 012 Alfa Charlie plus 131 minus 0330 017 plus 28 plus 48 4098, 0132 Alfa plus 262 minus 0282 019 plus 08, plus 06 4258, 0141 Bravo plus 220 minus 0620 020 plus 31 plus 03 4163. Houston. Over.


Roger, Wally. Readback is correct. Break. When we get over Hawaii, we are going to want to make an E memory dump by a VERB 74. And essentially, you'll be starting out with a clear DSKY, a VERB 74 enter, and then wait 1 minute.

Roger.

Houston, Apollo 7. I would like to log at 10 plus 35. I had 11 squirts on this water
pistol, and I'd like to log that the beef stew
bites tend to be very crumbly and a lot of
crumbs when you open the package even. Pretty
crumbly food!

Copy the crumbly food.

Apollo 7, Houston.

Go ahead.

Roger. Wally, at this time we would like to
try Duplex A, and please notify when switching
to Duplex A.

On your MARK.

Roger. Duplex A -

Now.

Houston, Apollo 7. How do you read Duplex A?

Apollo 7, Houston. It's a little more garbled
than the other, but still about four-by-five.

Roger. You sound exactly the same.

Roger. Let me check to make sure we're receiving
downlink and that we can proceed with our
WERB 74.

Roger. Do you want me to remain Duplex A?

That's affirmative. We will stay Duplex A until
we get close to LOS, and if we happen to miss
it, return to Simplex A at LOS.

Wilco. And, for the dump I will do a ... ENABLE
right?
That's a negative. You want to make sure the DSKY is clear, and it looks like it is. ... Enter VERB 74 and enter, and then we will wait 1 minute.

Standing by on your MARK.

Apollo 7, Houston.

Proceed, VERB 74.

Houston, we're standing by.

Roger. Enter it, babe.

Wally, you can go ahead and make the entry from on board. We're not going to send it to you.

Apollo 7, Houston. Request you enter VERB 74.

Apollo 7, Houston.

Apollo 7, Houston.

Go ahead.

Roger. Request you enter a VERB 74.

Yes.

Apollo 7, Houston.

Go ahead.

Roger. It looks like the E memory dump was good. We would like to verify the position of the water flow valve on panel 2 is in the AUTO position. That's the glycol evaporator water flow.

Houston. That's affirmative. The ... is AUTO; the feed pressure is AUTO. The water flow is AUTO.
Houston. Roger.

And it seems we just got the same thing again. Pressure ...

Apollo 7, Houston. Return to Simplex A and about 1 minute to LOS.

Roger. Simplex A.

Apollo 7, Houston.

Apollo 7, Houston.

Houston, Apollo 7. Do you read?

Apollo 7, Houston. Affirmative. Read you.

Roger. I'm reading you very weak. It seems we've been running into a lot of passes here where between passes we're left without a tape recorder running, and we don't quite know the status of it when we're left that way. We would like to be using it to record some of these problems. I assume you're observing the anomaly we've got in our steam pressure now. I'm going to reservice the water boiler.

Roger. I understand. You're servicing the water boiler.

Apollo 7, Houston. ACS Mercury.

Roger.
This is Apollo 7. We temporarily had our primary loop back working on the line. It is beginning to look like either the primary water flow valve - for a while we thought it was flux shutdown. I'm wondering if we start playing with it, eventually we will get it to come back up. The steam pressure reading was normal for a while, and it was controlling around a temperature of about 43. Right now, we are pegged low again. It looks like it is possibly the water control section of the 240 controller.

Walt, say again your last sentence there. It looks like what?

I believe it is probably getting down to the water control section of the 240 controller. Also, we have a DTO to accomplish here. The CRYO stratification for hydrogen. It is - both tanks are within 90 plus or minus 5 percent of the hydrogen, and the procedure calls to let the pressure rise to about 260 to 265, and I believe that is the spec number. I would like the EECOM to tell me how high these pressures have been rising before they - the heaters shut off so I will know where to start doing the DTO. Over.

Roger. Stand by. We will get it for you.
More specifically, Ron, I need the deadband that the hydrogen pressure tank 1 and tank 2 have been running back and forth between.

Roger.

Tell Wally we just took a couple more pictures of his mountains to update them.

Roger.

And we have been throwing data on that tape, and I hope we can get something worked out on that - the tape dumps - because we're terribly handicapped if we don't have the tape available to log on.

Roger. We concur, and I think we're back in cycle now on the thing.

Okay. Understand. It would be nice if you know that we are going to be going over the horizon without the tape in a RECORD mode for us. Let us know.

Roger. What it amounts to on these night passes or nighttime here, is that we're down to just about one site per rev to dump it, and the Mercury S-band is down right now.

Roger.

We only have two stars available for the 252 alignment.
00 12 09 58 CC Roger. We will have it shortly.

00 12 10 25 CDR Air frame 6 and magazine Bravo. Correction, magazine Peter. ...

00 12 10 39 CC I missed that, Wally. Say again.

00 12 10 41 CDR Roger. ... I would estimate that he is a coonie.

00 12 10 47 CC Ah so.

00 12 11 43 CDR Ron, do you have someone working with two stars?

00 12 11 51 CC Wait one - I think - P52. Don't we just pick a pair out of the CMC?

00 12 12 01 CDR Roger. We will go ahead like that.

00 12 12 03 CC Roger.

00 12 12 07 CDR Anybody come up with any suggestions on our RCS problem? The malfunction procedures call for activating the secondary loop whenever the primary radiator outlet temperature gets above 48. I have been resisting doing that and kind of going by the glycol EVAP TEMP. Right now, I am reading almost - radiator outlet temperature now that my glycol evap outlet TEMP is on about 52.

00 12 12 37 CDR I would like to hold to not activating the secondary loop until the primary glycol evaporator outlet TEMP would hit 60.

00 12 12 43 CC Apollo 7, Houston. We concur on that. We kind of believe that we're really - not really hot enough, and then we're starting to cool
down when it starts evaporating - maybe over Houston going too cold on that thing. We’re working on that right now.

Okay. During the night pass, the glycol evaporator outlet temperature got down as low as about 45 - something like that - before we got the evaporator working again.

Roger.

Do we have anybody who can ... data ...

7, Houston. LOS.

HAWAII (REV 8)

Apollo 7, Houston. I have your deadbands for H₁ and H₂ tanks.

Roger. Go.

Roger. Tank 1 - H₂ tank 1 - 228 to 246, H₂ tank 2 237 and 255.

Roger. 228 to 246 and 237 to 255, and I see that's what the pressures have been cycling back and forth. ... with the heaters.

That's affirmative in the R/O autoheaters and you can tell Wally that it looks like stars 11 and 12 would probably be pretty good stars to try for.

Roger. Eleven and twelve, thank you. And we will accomplish the zero-g test after the alignment. We're still showing about 87 percent.
REDSTONE (REV 8)

00 12 39 20 CC Apollo 7.
00 12 39 47 CC Apollo 7, Houston. Opposite omni.
00 12 40 37 CC Apollo 7, Houston. Let's try the original omni again.
00 12 41 02 CC Apollo 7, Houston. I've got some hot dope on the S-IVB.
00 12 41 44 CC Apollo 7, Houston.
00 12 42 23 CC Apollo 7, Houston.
00 12 43 20 CC Apollo 7, Houston. Go ahead and try in the blind. I understand you're reading us weak. We do not read you. We're monitoring the relative motion of the S-IVB and the spacecraft.

It looks like it may require another phasing burn at about 16 to 16 and 1/2 hours. The DELTA-V will probably be 6 to 6 and 1/2 feet per second. Over.

00 12 43 54 CDR Apollo 7. I read your message but very weak.
00 12 43 57 CC Roger.
00 12 44 00 CDR It's lunch time at 16 hours. Is that correct?
00 12 44 03 CC That's affirmative - about.
00 12 44 08 CDR Roger.
00 12 46 11 CC Apollo 7, Houston. Thirty seconds LOS.
00 12 46 15 CDR Roger, Houston. We got your message.
00 12 46 18 CC Roger. Thank you.
CVR 17. I've got four balls, one on the
star data check, and use star number 1 Alphe-
ratz, star number 7 Menkar, and we're going to
go ahead and take the gyro torquing angle. Is
that the intention? Over.

CVR 7, Houston. We'll take those angles.
ASCENSION (REV 9)

CVR 7, Houston. We'd like for you to switch
to Simplex B on my MARK.

Okay.

CVR 7, you switch to Simplex B.
MARK.

Houston, Apollo 7. We read Simplex B.

Apollo 7, Houston. Roger. You got a lot more
graph at this time on Simplex B than on A.

You're still coming through clear, but you're
way down. I'd say about level 2 compared to
the other.

Roger. And, Walt, we would like to verify that
the primary evaporator water control valve on
panel 382 is in the AUTO position.

Roger. Did you read the data on the P52 that
I did for the REFSMAT realignment?

I missed that. Say again.

Roger. ... downlink when I did the P52 for the
REFSMAT realignment?
Affirmative. Three balls 1 and stars 1 and 7; and, secondly, we would like to know what portion of the malfunction procedures that you have accomplished on the primary glycol of that AIT TEMP HI?

Roger. I've gone down to box 18 or box 21, depending on how long you wait or whether you take the intermediate characteristics or not. That thing has stayed down for a long period of time; then it came up fairly spontaneously to steam pressure.

Roger. We understand.

And one time ended up over with the primary evaporator water control valve ... closed. The other possibility is the evaporator was frozen. I'm going to go check the water control valve now.

Roger. Can you do that without disturbing our sleeping CMP?

We will be doing it. I also would like to get the same pressures that the height — that the oxygen tank is controlling to the actual pressures.

Roger. I have them if you're ready to copy.

Ready to copy. Go.
00 13 08 46  CC  O2 tank 1 deadband 880 to 926, O2 tank 2 870 to 912.

00 13 08 52  SC  Roger. Thank you. And how about just correlating between what these meters are reading, if you want to run that 5.8 cryo zero-g test.

00 13 08 59  CC  Roger.

00 13 09 01  SC  And the hydrogen test is in work now.

00 13 09 07  CC  Roger.

00 13 11 17  CC  Apollo 7, Houston. One minute to LOS. Simplex A on LOS.

00 13 11 24  CDR  Roger.

00 13 11 25  LMP  And that was a good try on the evaporator water control. The evaporator water control primary is in AUTO; and for your information, I'm also running with the evaporator water control secondary in AUTO in case I do get into a situation where I have to activate the secondary loop.

00 13 11 45  CC  Roger. Understand.

00 13 12 00  LMP  Hey, Ron. It's not a good situation, but I don't consider we got any kind of real problems with that primary coolant loop right now.

00 13 12 13  CC  7, Houston. We concur with that.

00 13 12 21  CC  7, Houston. We're just now looking at the dump data that we have picked up on REV 7.

00 13 12 28  CDR  Roger.
Mercury (Rev 9)

00 13 41 01  CC  Apollo 7, Houston through Mercury.
00 13 41 05  SC  Got you loud and clear.
00 13 41 10  CC  Roger. We would like to get a PIPA count. We would like to get
your onboard readout. Our PIPA count down here has - oh, it's been zero for a long time.
00 13 41 35  CT  ... through us.
00 13 41 44  LMP  Hey, Ron. I concluded the CRYO T 5.5 for the hydrogen
tanks at 90 percent level, and it didn't
look to me like we had any stratification. My
pressures that were loaded down did drop a little
bit, but I'm not sure just from the angle I'm
reading it.
00 13 42 12  CC  Walt, you are coming through EF at this time
across there, and I can't read you very well.
Can you talk a little slower?
00 13 42 19  LMP  Roger. Understand. I did complete the hydrogen
tanks, a 90-percent portion of the CRYO
stratification test; and as I compared others,
it was my own estimation that we really didn't
have any stratification there.

Guam (Rev 9)

00 13 52 38  CC  Apollo 7, Houston.
00 13 52 41  CDR  Go ahead.
Roger. Current tracking indicates that the service module - the command/service module will trail the S-IVB at MCCL by about 30 miles. So if we go ahead and do this upcoming maneuver, we will yield about nominal displacement a MC - MCCL. The S-IVB orbit on third day, however, yields a displacement between 63 and 87 miles if we go ahead and make the burn. And this was all based on beacon tracking, so it's pretty good.

Roger.

... Let's get to it.

Roger. We're working on the update, and we'll probably give it over Redstone.

Okay.

Looks like the GETI is about 15 plus 52, though.

Roger.

REDSTONE (REV 9)

Apollo 7, Houston. I have a maneuver PAD to give you.

Apollo 7, Houston.

Apollo 7, Houston. Opposite omni.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston through Redstone.

Roger. We read you.

Roger. I have a maneuver PAD to give you.
You're very weak, but we think we can take it. Go ahead.


Apollo 7, Houston. Opposite omni.

Apollo 7, Houston. Did you copy?

Apollo 7. One minute LOS; Ascension 14 plus 39.

Roger. We read your whole message. Did you copy back?

Negative on the readback.

ASCENSION (REV 10)

Apollo 7, Houston through Ascension.

Roger, Houston. This is Apollo 7. How do you read this time?

Roger. Loud and clear this time, Walt. We plan to reservice the evaporator and then shut it down.

52 0000 NA 1647 plus 1202 00065 32445 NA NA 019 181 276 001. And I copied all the realign.

Apollo 7, Houston. Say again the GTI.

Roger. GTI is 015 52 0000.

Roger. Your readback is correct. 7, Houston. The steps on reserving the shutdown are real
good. Reference information; make sure you have them. Lock all the back steam pressure practically AUTO to MANUAL. Steam pressure INCREASE switch, INCREASE for 45 seconds. Glycol is at - E2O flow ON for 2 minutes and then center.

Roger. You know I have already done that twice in the past, and if you notice now that steam pressure is unhooked and come back up. It seems to come up whenever the glycol evaporator outlet temperature gets down pretty cool like during the night. Do you want me to continue in going to MANUAL, INCREASE 45 seconds, and reservice the water evaporator?

Affirmative. We just want to reservice it now and then shut it down.

Roger.

The idea, Walt, is that the radiators will carry a load without the primary evaporator on the line.

I don't think we have any manual control over the steam pressure. I am going to service the water flowing now.

Roger.

Wally seems to have a pretty bad head cold. He took two aspirins about 15 minutes ago, and he has been blowing his nose.
Walt, say again. I missed that.

Wally has a pretty stuffed-up head here. He took two aspirins about 15 minutes ago and has been blowing his nose pretty much all day long.

Roger. We understand.

We would like to check on ... About 1 minute until LOS there, Walt. We just want to make sure that you realize we are trying to shut down evaporator, and we think the radiator will carry the load.

Roger. See you all later ...

Apollo 7, Houston. I can give you time back at 35 minutes prior to the burn. Four, three, two, one.

MARK.

Thirty-five minutes.

That's 35, wasn't it?

Affirmative, 35.

Around - here at the glycol evaporator, and we have the steam pressure in MANUAL and the water flow OFF, but that last bit of servicing I did seemed to do a good bit of increase in the steam pressure.
Roger. Understand. The last bit of servicing increased the steam pressure?

Yes. That last 2 minutes worth brought the steam pressure up right handily. Right now I'm reading about .23 on the steam pressure.

Roger.

Walt, we concur with that. That's okay.

That's good news. Yes.

Roger. Is there an MD type there, or do you still have those experimental doctors there?

They're watching and waiting.

You know I asked about taking a decongestant or antibiotic.

Roger. Stand by. I wasn't aware of that, Wally; I'll get the word on it.

Didn't you get the word that Walt passed back earlier? I've taken two aspirin.

Say again. I think that was in the garbled part that we couldn't make out. Say again the problem.

I have a nose cold. I've already gone through about eight or nine Kleenexes with some pretty good blows. I've taken two aspirin, and I am wondering if there is anything else I could take?

Roger.

I'd like to find out your druthers on the water boiler after that last servicing. If
we're going to leave it off for a while -
because you know we don't really need it -
I'd still sometime in the future like to run it again. I'm not sure but what it's not working right now.

Walt, this is kind of what we expected in this condition with them not running, and what we'd like to do is try to rev, at least a rev anyhow, with the EVAP off the line.

Roger. Whatever you say.

Wally, Houston here. The good doctors are recommending that you take one Actifed or the Code Echo.

A decongestant; is that it?

That's affirmative. That's what it is.

Okay.

Apollo 7, Houston. We want to take a look at the PIPA biases. We'd like you to remain in Ph7 for awhile after the burn on the Redstone pass.

Okay.

Apollo 7, Houston.

Go ahead.

Roger. It looks like we're going to have to have one final request after the burn here.
Our calculations show that our waste water is going to be 85 percent at about 19 hours, and we're not sure whether Donn can hook up all this good deal stuff in the middle of your guys' sleep period, so it's kinda at your discretion - whether you want to dump it prior to going to bed or let Donn dump it sometime around 19 hours.

Roger. It's all been hooked up now. We have that urine dump hose hooked up at one end all the time. It's a simple job for one fellow without disturbing us, but I had mentioned - at least to Deke - about putting that waste water tank on up to more like 95 percent so you don't have to have quite as high an activity dumping it all the time.

We're kinda agreeing with you in a way, and yet we'd kinda like to let it run up to the full ... point a little later on in the mission than in the early part of the mission.

... Okay. We do have a gage ... 5 percent up above 90 - without too much strain if we can get around to it.

Walt, I think we can give you probably an actual number a little later on in the mission here when we figure out how much fuel cells
are dumping in the water in and all these good
deal things.

00 15 29 29 LMP...

REDSTONE (REV 11)

00 15 48 14 CC Apollo 7, Houston through Redstone.
00 15 48 51 CC Apollo -
00 15 49 19 CC Apollo 7, Houston. Request omni A.
00 15 49 29 SC Roger. Omni A.
00 15 49 32 CC Roger.
00 15 52 02 SC Turning.
00 15 52 04 CC Roger.
00 15 52 28 SC Braking, please.
00 15 52 30 SC Roger.
00 15 52 31 CLR We flipped it in that burn that long. Residuals
are zero on the DELTA-V gage - and completed the -
00 15 52 39 CC Do you affirm?
00 15 55 29 CC Apollo 7, Houston. One minute LOS. I believe
that we got our money's worth of day. How about
getting a good night's sleep?
00 15 55 38 CMR Roger. Ron, thanks for your help, and Donn is
on watch.
00 15 55 42 CC Roger.

CANARY (REV 11)

00 16 21 51 CC Apollo 7, Houston.
00 16 21 58 CMR Houston, Apollo 7. Go.
Roger. I have two items: we would like a check on the CMP BIOMED harness when it is convenient; we are not getting anything; and we would like to check the pin connectors, the signal conditioners, connectors, and at last resort, press down on the sensor. Second item: information, it will probably take about 28 minutes for draining the H2O.

Roger. I have been fighting this harness. It doesn't make up properly. I don't know how we are going to get it ...

Roger.

Running water.

I am sorry, Apollo; I cut you out. Say again, please.

I say BIOMED harness is not making up properly. I don't know whether it is going to work.

Roger.

MERCURY (REV 11)

Apollo 7, Houston.

Houston, Apollo 7. Go.

Roger. I have a couple of items here that we would like verification if you have it; that the water chlorination was performed at 11 hours and 20 minutes. Second item, I
mentioned it before, but I couldn't understand the answer. We want to advise it will take 28 minutes to drain the water.

00 16 52 53  CMP  Roger. Understand. Twenty-eight minutes to drain the water. You are referring to the waste-tank dump.

00 16 53 00  CC  I am sorry, waste-tank dump. Affirmative.

00 16 53 04  CMP  Roger. We are only up to 40 percent on waste water so we got a ways to go.

00 16 53 10  CC  Thank you.

00 16 53 14  CC  Apollo 7, Houston. Did you read me on the water chlorination?

00 16 53 19  CMP  Roger. We did the chlorination at 11 hours 20 minutes; Wally did it.

00 16 53 24  CC  Thank you.

00 16 53 39  CMP  Houston, Apollo 7. Command module pilot got about 6 hours of sack time, of which 4 hours was pretty decent sleep. I would have slept a little better except that I am not used to going to bed at 6 o'clock local time for me. I think in a day or two I will adjust to the cycle.

00 16 54 00  CC  Apollo 7, Houston. Roger.

REPSTONE (REV 11)

00 17 24 22  CC  Apollo 7, Houston.

00 17 24 25  CMP  Houston, Apollo 7. Go.
Roger. We have a procedure that we would like for you to go through for some ground analysis. We monitor that you are in POO. We would like for you to follow this procedure: VERB 22 NOUN 21, enter.

Roger. You want me to do VERB 22 NOUN 21, enter.

Affirmative.

It is done.

Thank you.

Roger. Now go plus 1111, enter.

Roger. Plus five ones, enter.

Affirmative.

Apollo 7, Houston. They are merely monitoring this from the ground. Also, one other point: they would like to confirm the 40 percent reading on the water, on the waste water.

Oh, wait a second. Stand by. That is 75.

Roger. Understand. Seventy-five.

Roger. I gave you the wrong number before.

CC

Apollo 7, Houston, AOS Canary.

Roger, Houston, Apollo 7.

Apollo 7, Houston. Opposite omni, please.

Roger.
Apollo 7, Houston. Coming up in about 2 minutes
LOS at Canary, and we have a brief pass at Madrid.
And it will be about 40 minutes before we pick
you up at Honeysuckle, and we will need the S-band
volume up at that time. That will be Honeysuckle
about 18 38.

Roger. Understand. Honeysuckle S-band only,
18 38.

Roger.

HONEYuckle (REV 12)

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston. One minute LOS Honeysuckle;
Redstone at 18 plus 57.

REDstone (REV 12)

Apollo 7, Houston.

Roger. Houston, Apollo 7. Co.

Roger. AOS Redstone.

Roger. I missed you at Honeysuckle.

Roger. We couldn't get lock-on.

That is what I thought. It sounded like it was
trying there a couple of times.

I thought I heard you trying to answer, too.

All I heard was keying and side tones.

Yes.
Apollo 7, Houston. Would like some clarification on the BIOMED harness. If you can, just briefly, was it the connectors wouldn't stay together or what?

Well, I got it together now. Are you getting any signal on it?

Negative. Okay. That is all I wanted to know.

Roger. I had trouble getting the plugs to make up. They would stick together, but they wouldn't quite go all the way in and lock. I finally got it to lock.

Apollo 7, Houston. Roger. Copied. And what is you H₂O waste water quantity now?

Apollo 7, Houston. Opposite omni, please.

Apollo 7, Houston. Opposite omni, please.

Roger, Bill. I just switched off. Did you want to go back?

Negative. Stand by one.

Apollo 7, Houston. Negative. You have it now. We have COMM, and we lost you there for about a minute.

Roger.

CAP COMM.

Apollo 7, Houston. Opposite omni, please.

Apollo 7, Houston. One minute LOS Redstone; Antigua at 19 plus 16.
Apollo 7, Houston.

This is Apollo 7. Go.

Roger. AOS at Antigua. We have about 20 minutes.

Okay. Bill, I have some readings on command module RCS jet temperatures. Do you want those numbers?

I'll take them. Go.

Okay. These are test meter readings. They are all - 5C is 5 volts; 5D is 4.8; 6A was 4.8; 6B, C, and D were all 5. These were taken about 15 hours.

Roger. Understand. Hello, Apollo 7, Houston. I do have a flight plan update.

Roger. Go with your flight plan update.

At 23 plus 53, TV on. That is at Texas AOS on stateside pass. That is the end of the flight plan update.

I understand. You want TV on at 23 plus 53. How does that fit in with our burn and rendezvous sequence?

That should fit in all right.

Okay. Sounds like you got some music coming in the background. Is that you?

You must be picking up the twilight zone there.
Bill, is someone trying to pipe in a radio program to us, or are we just picking that up spiritually?

That must be a spurious signal, Donn. No, we don't have anything piped in.

Okay. I am getting a hot tip on some hospital insurance plan from some guy.

Okay. Maybe they are trying to tell you something.

Maybe he knows something I don't.

Apollo 7, Houston. Coming up on LOS Antigua; AOS Canary at 19 plus 27.

Roger. Understand. Log another 12 clicks on water for me, will you?

Roger.

Apollo 7, Houston. AOS Canary.

Roger. Go.

Apollo 7, Houston. Coming up on LOS Canary. Carnarvon at 20 plus 03.

CARNARVON through HONEYSUCKLE (REV 13)

Apollo 7, Houston.

This is Apollo 7. Go.

Roger. AOS Carnarvon.

Roger.

Houston, Apollo 7.
Roger. I was just doing a little star examination here at sunset with the sun at my back, so to speak, and you can see stars - quite a few - out the telescope; however, the minute you move the telescope controls, a lot of shiny white particles flutter out, and they obscure the field of view. I know what that is; apparently, these particles are some moisture in the optics assembly that get out when you're moving around in shaft motion, and they go out and obscure what you're looking at if the sun is shining on them.

Roger. I understand that you can see stars in the telescope okay with the sun at your back; however, when you move, the optics in shaft - their white particles come off and sort of cloud the view.

That's right. Looks like it's snowing out there, and it would be impossible to do any kind of useful alignment with a situation like that. Also, at times when the sun is more direct on the side where the optics are, it appears to be either a lot of light leak or sun shining reflecting down inside the optics assembly, but except at near sundown with the sun at the opposite side from the optics, you just don't see anything when
you look out there. You just see a big blur of light.

Roger. I understand that you apparently have something that looks like a light leak when the sun is directly on the side of the spacecraft where the optics are located?

Oh, I don't know if it's directly on that side or not; it's kind of hard to tell, but at times when the sun is up and we get some random drifting attitude here, I've looked in to see if I could see anything, and it was just near impossible. There was just a lot of light in the telescope. It had the appearance of a light leak around - somewhere in the assembly. I don't know if that's true or not or perhaps it's just the reflection coming in, but it makes it hard to see anything.

Roger.

Apollo 7, Houston. Have you been able to go through an alignment?

Not in the daytime. I'm going to do a fine align here in just a minute.

Okay.

Houston, are you getting these gyro torquing angles?

Apollo 7, Houston. Stand by.
Apollo 7, Houston. Roger. We are receiving gyrotorquing angles.

Apollo 7, Houston. Coming up LOS Honeysuckle; at Redstone at 20 plus 33.

Apollo 7, Houston. Coaligning LOS Honeysuckle at Redstone at 20 plus 33.

Apollo 7, Houston. It has been advised that we monitor you have had a switchover to a secondary of low proportional unit in primary loop and request that you switch back to the primary for a proportional unit.

Roger. Stand by.

We are now back on one. Do you want me to leave it in one, or go back to AUTO?

Go to AUTO. Apollo 7, Houston. Go to AUTO.

Okay.

Also, we are now monitoring 85 percent on waste water.

Say again.

Ground monitors 85 percent quantity on waste water.

I can't read you, Bill; you're coming in garbled with a lot of static.

Roger. Waste water dump, waste water dump: we're monitoring 85 percent.
CC 00 20 37 36 Apollo 7, Houston. How do you read now?
CMP 00 20 31 49 That's better, Houston.
CC 00 20 37 51 Roger. Did you get my call about the waste
ter dump?
CMP 00 20 37 58 Roger. Say again about the water dump.
CC 00 20 38 00 We are monitoring 85 percent quantity waste
tool now.
CMP 00 20 38 15 Roger. Understand you got 85; I'll have to
got Wally up to get under him, to get those
 pieces. I'd rather wait until he wakes up,
 which - he'll be awake in another hour or so
 anyway. Could we wait till then?
CC 00 20 38 27 Roger. Stand by.
CC 00 20 38 49 Apollo 7, Houston. Affirmative. You can wait
another hour. We're 1 minute LOS Redstone, and
we'll have AOS Bahamas at 20 plus 49.
CMP 00 20 39 02 Understand.

GRAND BAHAMA ISLAND through BERMUDA (REV 14)
CC 00 20 50 53 Apollo 7, Houston.
CMP 00 20 50 57 Houston, this is Apollo 7. Go.
CC 00 20 50 59 Donn, I would like to brief you all on something
that has come up here, and it has to do with
the Y PIPA. Statement is made that based on
telemetry readouts, we feel or suspect that
Y PIPA counts are not getting into the CMC.
We've been monitoring practically zero. Now
this is still sort of in ferment, but it looks like now they would like to have an RCS burn completed to perform a check on the Y PIPA's. If so, this will be done on the next rev over Texas.

Apollo 7, Houston. This would be a sort of small burn plus Y, then minus Y, then total DELTA-V about 5 feet per second.

Bill, I missed practically your whole transmission, and all I heard was that you had something for me, and then you said something about a small burn. Would you run it by again, please?

Roger. Apollo 7, Houston. How do you read now?

Roger. It's loud and clear.

Right. Based on telemetry readouts, we suspect the Y-axis, Y-axis PIPA counts are not getting into the CMC. In order to check this out, we would like to do a small RCS translation plus Y and then minus Y. Total test will consume about 10 pounds of fuel, and it's proposed that this be performed at 22 plus 23 and will be over Texas on your next pass.

Okay. Twenty-two plus 23; you will want a plus Y and a minus Y. Do you want us to have a program up like 47, then?
Okay. I'll go through the procedure that is proposed here now. Step 1, we would like to -
the test to be done in POO; also, we would like to have A/C roll ENABLED. Then the attitude would be roll 180, pitch 326, and yaw zero. With that attitude, we would like a plus Y translation for 7 seconds, then turn the A/C roll back off.

Wait a second, just hold the phone. You want POO, you want A/C roll ENABLED, I got 180, 3260 roll; and after that, I was replying on that, but you were talking. Would you say again all that after the attitude?

Roger. Sorry about that. I will go a little bit slower. Roger. I'll go back over it. You got it copied correctly. We do want it in POO, and we would like the SCS channel A/C roll ENABLED also for the test. Attitude, roll 180, pitch 326, yaw zero. With that attitude, translate plus Y 7 seconds; then wait 30 seconds, 30 seconds; then translate minus Y for 7 seconds; then turn the A/C roll channel back off.

Roger. You have a terrible squeal in there, Bill; I don't know what it is. I understand, and you want plus Y for 7 seconds, then pause 30 seconds, then minus Y 7 seconds. Now at what time again did you want this, 22 plus how many?
00 20 55 57  CC  We would like that at 22 hours and 23 minutes. That will be over Texas.

00 20 56 04  CMP  Okay. I guess we can do that. Just out of curiosity, what do you hope to prove by having only P00 going? That won't - certainly won't put into the same vector if you do that.

00 20 56 18  CC  Well, actually what we want to do is monitor your PIPA's and see if in fact they are feeding information into the computer.

00 20 56 28  CMP  I see.

00 20 56 34  CC  Also, I have a block data update if you will call me when you are ready to copy.

00 20 56 41  CMP  All right. Stand by.

00 20 57 55  CMP  Bill, you can go ahead with your block ...

00 20 57 59  CC  Roger. Be for 015 dash l Alfa plus 291 minus 0629 0021 042 275, 016 dash l Bravo plus 312 minus 0630 023 46 13, 017 dash l Alfa plus 298 minus 0629 025 22 18 856, 018 dash l Alfa plus 252 minus 0685 026 5628 5106, 019 dash l Alfa plus 31 0624 029 43 42.

00 21 00 25  CC  Apollo 7, Houston. Are you reading?

CANARY (REV 14)

00 21 02 55  C7  Apollo 7, Houston.

00 21 02 57  CFP  Roger. Go ahead, Houston. You dropped out there for 3 or 4 minutes.

00 21 03 02  C7  Roger. Meyer here. How far did we get through on that?
00 21 03 10  CMP  Just up to 15.
00 21 01 13  CC  Roger. Did - okay, I'll go through 015 dash 1 Alfa briefly again. 015 dash 1 Alfa plus 291 minus 0629 022 1042 4275. Starting with the next one: 016 dash 1 Bravo plus 312 minus 0630 023 4641 4539, 017 dash 1 Alfa plus 298 minus 0629 025 2218 4856, 018 dash 1 Alfa plus 252 minus 0685 026 5628 5106, 019 dash 4 Alfa plus 341 minus 1624 029 4342, 4363 0202 plus 310 minus 1623 031 1829 4679, 021 dash 4 Alfa plus 261 minus 1633 032 53 56 4944, 021 dash 4 Alfa. Standing by for readback.

00 21 06 17  CMP  Roger. Read back follows: 015 dash 1 Alfa plus 291 minus 0629 022 10 42 4275, 016 dash 1 Bravo plus 312 minus 0630 023 46 41 4539, 017 dash 1 Alfa plus 298 minus 0629 025 22 18 4856, 018 dash 1 A plus 252 minus 0685 026 56 28 51 01. - Apollo 7, Houston.

00 21 07 35  CC  Apollo 7, Houston.
00 21 08 21  CC  Apollo 7, Houston.
00 21 08 33  CC  Apollo 7, Houston.
00 21 09 03  CC  Apollo 7, Houston.
00 21 09 20  CC  Apollo 7, Houston.
00 21 09 21  CMP  Roger. Go.
00 21 09 25  CC  Roger. I only got part of the readback. If you would confirm in the third block 017 dash 1 Alfa, second line plus 298.
Roger. Plus 298.

Okay. If you would pick up and read as far as you can get, starting with 019 dash 4 Alfa.

Okay. Here goes: 194 Alfa plus 314 minus 1624 029 4342 4363, 020 dash 4 Alfa plus 310 minus 1623 0311829 4579, 021 dash 4 A plus ...

CARNARVON (REV 14)

Apollo 7, Houston.

Roger. Houston, Apollo 7. Go.

Roger. AOS Carnarvon. I also have an advisory. We're monitoring 90 percent - 90 percent on waste water now, and we'd like to get a dump whenever - as soon as it is convenient.

Okay. Wally is still in the sack. As soon as he's up, we'll dump it; and meanwhile, I'm starting to maneuver around to the attitude for that little test maneuver you want to do.

Roger. Thank you.

Apollo 7, Houston. We have about a little over 1 minute to LOS Carnarvon. Request S-band volume up, please.

Roger. S-band volume going up.

Thank you.

HONEYSCUKE (REV 14)

Apollo 7, Houston.
Roger, Houston. Go. Apollo 7.

Roger. After the RCS test over the States, we will be sending up two NAV loads and one target load, and we will just work on them as soon as we can.

Okay. Fine. Hey, Bill?

Roger. Go.

Roger. A couple of hours ago - I neglected to tell you before that, and I'm sorry - we had an anomaly up here. We got an AC bus 1 drop out, and all we did was reset it, and it kept on running; and we never did see anything anomalous other than that, other than we confirm that the voltage has dropped off and the inverter had come off the line apparently.

Okay. You had an AC bus 1 drop out. You reset it, and it was okay, but you did confirm it was a bona fide malfunction because the voltage did drop.

That's right. All three phases were - well, were pegged on the bottom of the meter, and all we did was hit RESET and punch the warning lights off, and it kept right on running.

Okay. Thank you very much. That is copied.

Okay. We've had no trouble with it since. Everything's been normal.
00 21 48 39  CC  All right. Thank you.
00 21 52 50  CC  Apollo 7, Houston. Coming up on LOS at Honeysuckle. We will have acquisition Texas at 22 plus 19.
00 21 53 00  CMP  Roger. You are saying 22 plus 19.
00 21 53 02  CC  Roger.

TEXAS through BERMUDA (REV 14)

00 22 19 53  CC  Apollo 7, Houston.
00 22 19 58  SC  Roger, Houston. Go.
00 22 19 59  CC  Roger. AOS Texas. I'll give you a time hack here.
00 22 20 09  CC  Twenty-two hours, 20 minutes, 9, 10, 11, 12.
00 22 20 15  LMP  Roger. We're right on it.
00 22 20 18  CC  And counting to burn: 2 minutes and 38, 7, 6, 5.
00 22 20 29  LMP  Roger. Thank you.
00 22 20 49  LMP  Houston, Apollo 7. Do you read?
00 22 20 52  CC  Roger. Apollo 7, Houston. Go.
00 22 20 53  LMP  Roger. I'm on the right lead headset. I commenced dumping the waste water tank about 2 minutes ago. I'd like to have you confirm the temperature in that dump line whenever you get a chance.
00 22 21 06  CC  Roger.
00 22 21 15  LMP  And I understand Donn told you about the AC batt 1 temporary glitch there. I can't figure
why it came off; I don't think we have the automatic disconnect anymore.

00 22 21 26 CC Roger. Understand. We copied that one.

00 22 21 38 CC Apollo 7, Houston. We would like a TLM input to high, please; telemetry input high.

00 22 21 50 IMP Look. If you guys are in the middle of a dump, I have to go planned RESET to do that. If you are in the middle of a dump, I'm going to stop it.

00 22 22 01 CC We're not dumping.

00 22 22 13 IMP You guys can either stop your dump in command high, or I'm going to have to do it.

00 22 22 18 CC Apollo 7, Houston. We are not dumping.

00 22 22 22 IMP Okay. Thank you.

00 22 22 34 IMP Go up to high bit rate?

00 22 23 01 CC Roger.

00 22 23 05 CC Plus Y ...

00 22 23 08 IMP Affirmative.

00 22 23 18 SC Roger. We're going to count down to the burn.

00 22 23 19 CC Roger.

00 22 23 16 SC Four, three, two, one.

00 22 23 50 SC MARK.

TEXAS through BERMUDA (REV 15)

00 22 24 33 CC Apollo 7, Houston. That PIPA check looked good. Good information, and we will be updating your PIPA bias later.
Roger. Understand. PIPA check looked good.
Thank you.

Bill, we checked the PIPA's on here twice, and
I've got just about zero PIPA bias when I did,
although there is - someone else loaded it in;
I was a little suspicious, too, on the basis of
that. You say you did get outputs from it, and
you think we're still - the G&N is still okay?

Roger. Looks like it's so good, it fooled us.

Okay.

We were thinking along the same lines as you
were.

All right. I probably ought to get an updated
bias then.

Roger.

I show waste water quantity down to 50 percent.
How are you doing?

Stand by.

Can you tell me what dump line temperature is?

Apollo 7, Houston. I'm trying to get that in-
formation for you; stand by.

Apollo 7, Houston. Your dump nozzle tempera-
ture is 66 degrees, and the quantity is now reading
47.2.

Roger. Thank you. We're just about in agree-
ment with that.
Apollo 7, Houston. If you'll go to ACCEPT, we'll send up your NAV loads.

If you have time this pass, Bill, why don't you give us an updated readout on our quad RCS quantities?

Your RCS propellant quantities?

That's affirmative.

Roger. Stand by.

Apollo 7, Houston. We'll brief you on that just a little later.

Understand.

Apollo 7, Houston. Will you go to ACCEPT, please?

Correct telemetry.

Apollo 7, Houston. You are GO for a 33 dash 1.

Roger. Go for 33 dash 1. Did you receive our comment? We had a flight plan update for TV UD's and will be unable to support anything but the normally scheduled flight plan activities until after the rendezvous.

Roger. Understand.

Apollo 7, Houston. I am still waiting for the exact numbers, but your RCS propellant quantity does look near nominal.

Roger. Standing by.
00 22 31 54 CDR Hey, you notice any difference in the voice quality out of the spacecraft? I'm on the lightweight headset now.

00 22 32 02 CC I was reading Donn much more clearly.

00 22 32 07 CDR Understand.

00 22 32 22 CC Apollo 7, Houston. Both NAV loads and target loads are in; the computer is yours. Also, I have the - a list of the RCS usable propellants: quad A 285, B 299, C Charlie 281, D Dog 297.

00 22 32 57 SC Roger. You say 285, 299, 281, and 297. That right?

00 22 33 03 CC Apollo 7, Houston. Affirmative. And I am trying to get that converted to percent.

00 22 33 13 CDR We would like a total percentage readout on that, Bill.

CANARY (REV 15)

00 22 38 35 CC Apollo 7, Houston.

00 22 38 57 CC Apollo 7, Houston.

00 22 39 00 SC Roger. Houston, Apollo 7. Go.

00 22 39 04 CC Roger. Regarding the flight plan problem here: we would just ask to reconsider that, and it is in there at this particular time because of the passage over the site.

00 22 39 31 SC Roger. Bill, I understand. We're going to be pretty busy along about then, and I think we
are going to continue with what we had planned for normal activities.

Roger. Let me go over my update again there. That time was at 23 plus 53 plus 00, and I might have sent that time up wrong. Looks like at that particular time, it could possibly be worked in.

Roger. ... time, no TV till after rendezvous.

Apollo 7, Houston. I have the RCS propellant usable in terms of percentage. Do you want me to read them or not?

Roger. Go ahead.

Roger. RCS usable remaining quad A Alfa 86.7 percent, B Bravo 91 percent, C Charlie 85 percent, D Delta 90 percent.

Apollo 7, Houston. I have PIPA bias update.

Roger. Stand by.

Go ahead, Phil.

Roger. For the VERB 21 NOUN 1 enter 1720 enter, the PIPA bias is zero enter.

Roger. Understand, zero enter.

Roger.

Apollo 7, Houston. One minute LOS Canary; Tananarive at 22 plus 59.

Roger.
TANANARIVE (REV 15)

00 22 59 43 CC Apollo 7, Houston CAP COMM.
00 22 59 53 CC Apollo 7, Houston CAP COMM.
00 23 00 10 CC Apollo 7, Houston.
00 23 00 23 CC Apollo 7, Houston.
00 23 00 32 SC Houston, Apollo 7. How do you read me?
00 23 00 35 CC I read you five-by. How me?
00 23 00 39 CDR Roger. Reading you fine. Over.
00 23 00 41 CC Okay. Wally, I've got a T align time for you
    I'd like to pass up. We've got a short pass here.
00 23 00 48 CDR Go with it.
00 23 00 49 CC Roger. T align 23 plus 24 plus 08 00.
00 23 01 00 CDR Twenty-three plus 24 plus 08 00. Over
00 23 01 04 CC Roger. That's correct. Now, concerning the matter of the television, there's been considerable discussion here in the center. The Flight Director wants you to turn on the television at the appropriate time.
00 23 01 35 CDR Walt will be on the air shortly.
00 23 01 53 CC Okay. Wally, after this, I've got MCC1 PAD I'd like to give you, and if I can't give it here, I will give it over Carnarvon.
00 23 02 02 LMP Roger. Go with it.
00 23 02 15 LMP Go with your maneuver PAD.
Let's wait first and get Wally's comments on the television.

Okay, Walt. We'll go ahead with the MCC1 PAD here.

I'm ready to copy. Go.

Okay. 026 24 5510 plus 00617 minus 00010 plus 01985 1960 plus 1243 01978 32398 minus 090 minus 030 010 35 1981 151 025 41 --

We can read you.

We've lost him.

-- 5500.

CARRAVON (REV 15)

Apollo 7, Houston.

Houston, Apollo 7. Go ahead.

Roger. Wally, I'd like to finish the MCC1 PAD, and could you tell me how far you copied before we got LOS Tananarive?

Roger. Jack, I got 25 hours and 41 minutes on the NAV check. I didn't get the seconds. Continue after that.

Okay. Seconds - starting at the seconds; 5500 plus 2766 minus 05376 1226 359 284 359. You have the T align of 23 plus 24 plus 08 00.

Roger. The T align was 23 plus 24 plus 08 00, MCC1 26 24 5510 plus 00617 minus 00010 plus 01985 1960 plus 1243 01978 32398 minus 090 minus
00 23 15 18  CC  Roger. It's correct except the sign should be plus 2766.

00 23 15 27  CDR  Roger. I have plus here.

00 23 15 30  CC  Okay. You got it.

00 23 15 35  CDR  Houston, Apollo 7.

00 23 15 37  CC  Co ahead, Wally.

00 23 15 40  CDR  Roger. You've added two burns to this flight schedule, and you've added a urine water dump; and we have a new vehicle up here, and I can tell you this point TV will be delayed without any further discussion until after the rendezvous.

00 23 15 59  CC  Roger. Copy.

00 23 16 02  CDR  Roger.

00 23 16 07  CC  Apollo 7. This is CAP COMM number 1.

00 23 16 14  CDR  Roger.

00 23 16 17  CC  All we've agreed to do on this is flip it.

00 23 16 18  CDR  ... with two commanders, Apollo 7.

00 23 16 23  CC  All we have agreed to on this particular pass is to flip the switch on. No other activity associated with TV; I think we are still obligated to do that.

00 23 16 33  CDR  We do not have the equipment out; we have not had an opportunity to follow setting; we have not eaten at this point. At this point, I
have a cold. I refuse to foul up our time lines this way.

00 23 17 45  CC  Apollo 7, Houston. Could we have opposite omni please and your PMP power to OX?

00 23 17 54  SC  PMP going to OX now.

00 23 18 02  SC  Hey, Jack. They left us without that tape recorder running again on the last, - after the last pass. The problem we have here is I am hesitant to stop and COMMAND RESET and start tape going because you might be in the middle of a dump that you want to continue later. So we really are left without nothing - I mean between passes at the - tape motions left barber pole like that.

00 23 18 26  CC  Okay. We copy.

00 23 18 45  CC  7, Houston.

00 23 18 48  IMP  Go ahead.

00 23 18 49  CC  Walter, the reason the - you lost - you had the tape recorder at barber pole when you left Canaries; we had a power loss at Canaries just before LOG, and we didn't get the command to you. It shouldn't happen again; everybody has been briefed on the proper operation there.

00 23 19 10  IMP  Okay, Jack. I understand. I guess - I am going to assume if it's barber poled after we have left contact with you, then it's running in a
forward direction and ready to record. Jack, can you verify that?

Stand by. Let me get the word from EECOM.

Okay. Walt, EECOM says that is - that assumption of yours is correct.

Thank you, and for your information down there, I have yet to activate the SPS Line heaters. They have been off ever since liftoff. The temperature seems to be holding very, very constant at 70, and I verified that with the oxidizing feedline temperature, also.

Okay. Real fine.

And did you ever get the command module RCS temperatures down there during the night?

Yes, we did. Do you want them passed up?

Negative. We are going to read those from time to time and pass them on to you.

Okay.

Apollo 7, Houston. We would like to have your TIM switch switched to LOW.

... in RESET to stop the motion.

HONEYSUCKLE (REV 15)

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.
Roger. Wally, I'd like to finish the MCC1 PAD, and can you tell me how far you copied before we got to LOS Tananarive?

Roger. Jack, I got 25 hours, 41 minutes of the MAP check; I didn't get the seconds to continue after that.

Okay. Seconds ... 5500 plus 2766 minus 05376 1226 359 284 359. You have the key align 23 plus 24 plus 0800.


Roger. It's correct except the NOON 43; the latitude sign should be plus 2766.

HUNTSVILLE through BERMUDA (REV 15)

Luntville AOS.
Apollo 7, Houston.
Huntsville LOS.
Apollo 7, Houston.
Go ahead, Houston.
Roger. Wally, we have some information on your evaporator and ECS procedures for and during the rendezvous here.
We would like for you to stay in your present configuration using the primary system with the radiators. If the evaporator, or primary evaporator, or ALTI temperature goes higher than 60 degrees, we would like for you to activate the primary evaporator then. And if it doesn't work, we would like for you to reservice that primary evaporator and shut it down. Activate the secondary coolant loop with the radiator bypass.

Roger. Understood. Additional SOP and one question, did you say the glycol evaporator outlet temperature above 60 or the radiator outlet temperature above 60? Over.

Walt, the evaporator outlet temperature greater than 60.

Roger. Understand. Evaporator outlet greater than 60 and activate the primary water boiler; if it doesn't work again, I'll reservice it. Shut it down and activate secondary coolant loop with the radiator bypass.

Roger.

Houston, Apollo 7. I have the FMP back to normal after that last pass.

Roger. Copy.
HUNTSVILLE through BERMUDA (REV 16)

00 23 55 28  CC  Computer to you 23 hours and 56 minutes ...

00 23 56 34  SC  Roger. POO the computer.

00 23 57 39  SC  Roger, PAD 39. Hack it at 23 hours 57 minutes.

00 23 59 53  CC  Apollo 7, Houston.

00 23 59 57  SC  Roger. Sounds like you're having a ball down there.

01 00 00 00  CC  Roger. We just want you to know your key align for your REFSWAT compares favorably with ours down here.

01 00 00 06  CDR  Thank you ... we're just going by overhead, just skimming the Gulf Coast right over the water.
How does the weather look?

Not bad. About six to four-tenths scattered stratocumulus just coming in across Tallahassee at this point. See a little breakwater just south of there and the jet... going down to Orlando down by the ocean.

Roger.

Just took a picture of the breakwater for you. That's frame...

Did you request Crestview direct to Orlando?

We use (laughter) Tallahassee direct to Canaries.

Right north of Daytons W, just about over Jacksonville, I guess. The sky is about three-tenths coverage, but the Cape is out in the clear. Do you have anything else you want to send up? It's a good day for it.

Nothing right now.

We'll have you almost continuous coverage here through Canaries for another 15 minutes or so.

Roger. I've got to get back to the store here and get this little food down.

Okay. We'll stand by.

Apollo 7, Houston. Opposite omni.
01 00 08 10 SC Twenty-four hours and 6 minutes into the
flight, five clicks on the water gun for the IMF.
01 00 08 17 CC Roger. Copy.
01 00 08 33 SC Computer ... in the computer for the PIPA test.

CANARY (REV 16)
01 00 16 00 CC Apollo 7, Houston. Opposite omni.
01 00 13 20 CC Apollo 7, Houston. One minute LOS Canary;
we'll pick you up at Tananarive in about
15 minutes.

TANANARIVE (REV 16)
01 00 32 19 CC Apollo 7, Houston through Tananarive.
01 00 32 22 CDR Roger. Loud and clear.
01 00 32 24 CC You're five-by, also. We'll have continuous
coverage here through Carnarvon. ARIA 2 comes
up when we lose Tananarive in about 8 minutes.
01 00 32 36 CDR Roger. We have an observation for you. It's a
confusing thing, we concede; but every time
we have transit at sunset or at sunrise, the
particles that we have dumped through the dump
system illuminate brightly as we have seen
in the past. These affect the sextant and
telescope observations severely.

01 00 33 06 CC Wally, I didn't quite get it. Are you saying
that the dumps are affecting the sextant opera-
tion or is that —

01 00 33 14 CDR The reflection off the particles that came out
the rear deck on water dump.

01 00 33 22  CC  Roger. Copy.
01 00 33 24  CDR  ... stars, this would be a problem when we don't have the earth to block out the sun.
01 00 33 31  CC  Okay. Copy.
01 00 33 33  SC  I would like to get that info to flight planning for subsequent flights. The recommendation was not to dump urine or water prior to a required sighting.
01 00 33 44  CC  Okay. Copy that.
01 00 33 47  CDR  Roger.
01 00 34 08  CDR  Houston, Apollo 7.
01 00 34 10  CC  Roger. Go ahead.
01 00 34 12  CDR  We have a COAS alignment for you.
01 00 34 15  CC  Okay. Go ahead.
01 00 34 17  CDR  To place the X-axis of the spacecraft on target, the target must be located in the upper right quadrant - the so-called northeast quadrant up 1 degree and right 1 degree.
01 00 34 38  CC  Roger. Copy.
01 00 36 07  CMP  This is Apollo 7. I have the results of the command module RCS temperature check.
01 00 36 13  CC  Say again, 7.
01 00 36 16  CMP  I have the results from the command module RCS temperature check I've just completed. You may copy.
01 00 36 21  CC  Go ahead.
01 00 36 23  CMP  Roger.  5C and D and 6B, C, and D are all
      5 volts.  6A is reading 4.90 volts.
01 00 36 36  CC  Roger.  Copy.

ARIA (REV 16)
01 00 42 38  CC  ARIA 2.  Go RELYPTE.
01 00 43 03  CC  Apollo 7, Houston through ARIA 2. Standing by.
01 00 43 10  LMP  ...  
01 00 43 12  CC  Okay.  Walt, you're five-by.  We're standing by.
01 00 45 29  CT  ARIA 2 has acquisition, dropping in and out
      right at this time.
01 00 46 34  CT  ARIA 2 has two-way lock; ARIA 2 has two-way
      lock.

CARNARVON (REV 16)
01 00 50 35  CC  Apollo 7, Houston through Carnarvon. Standying
      by.  Stand by.
01 00 50 41  LMP  Roger.  Read you loud and clear.
01 00 50 43  CC  You're five-by.
01 00 50 49  CC  Walt, we pick up Honeysuckle in about 5 minutes.
      You might want to turn up your S-band at that
      time.
01 00 51 08  LMP  Roger.  I give you and O_2 partial pressure
      reading of 200 mm of mercury.
01 00 51 13  CC  Say again.
01 00 51 16  LMP  O_2 partial pressure, 200 mm of mercury.
01 00 51 19  CC  Okay.  Copy that.
01 00 51 25  LMP  Jack, I think you were breaking up. Did you
say we should probably bring up S-band on this
pass?

01 00 51 30  CC  We pick up Honeysuckle in at 55 here. You can
turn up S-band volume if you want.

01 09 51 37  LMP  Roger.

01 00 51 43  LMP  By the way, how does S-band sound to you down
there today?

01 00 51 46  CC  Everything sounds real good. It is a real
good COMM.

01 00 51 52  LMP  Very good. We were surprised you fellows
started talking over Tamanarive this morning.

01 00 51 57  CC  Roger.

01 00 51 59  LMP  That was pretty bad yesterday.

01 00 53 29  CC  Apollo 7, Houston. Could we switch your BINARY
switch to the commander?

01 00 53 36  CDR  Roger. My pulse is down now.

01 00 53 38  CC  Okay.

01 00 54 17  CDR  Houston, Apollo 7.

01 00 54 19  CC  Go ahead.

01 00 54 21  CDR  Did you validate the BC ... 0197.8, is that
correct?

01 00 54 29  CC  Stand by.

01 00 55 01  CC  Apollo 7, Houston. That is the correct number
at this time. We expect update, though, as
we progress.
01 00 55 10  CDR  Roger.

HONEY SUCKLE (REV 16)

01 00 57 00  CDR  Houston, Apollo 7.

01 00 57 02  CC  Go ahead.

01 00 57 03  CDR  Roger. Just before band check, we're GO.

01 00 57 06  CC  Roger. Copy.

01 00 57 52  CDR  Jack, could you give us an update on our
ascending node?

01 00 57 59  CC  Roger. You want a chart update, is that -

01 00 58 03  CDR  That's affirm.

01 00 58 04  CC  Okay. Stand by.

01 00 59 04  CC  Apollo 7, Houston. I have the orbital map
update.

01 00 59 10  CDR  Go ahead.

01 00 59 11  CC  Roger. For REV 16, the GMT of the node will
be 25 plus 12 plus 45, longitude will be
168.5 west, a right ascension 06 plus 27.

01 00 59 36  CDR  Roger. Right ascension 06 and 27, and the
crossing on the map is 25 plus 12 plus 45,
168.5 west.

01 00 59 48  CC  Roger.

01 00 59 54  CDR  Jack, on the cold I have, I took two aspirin
before sleep last night and one Actifed. That
is the total dose so far. Should I take
another Actifed during this period?
Dr. Barry says, "Yes. Take another one during this period."

And we are currently doing the oxygen part of P5.8.

HAWAII through BERMUDA (NAV 16)

Apollo 7, Houston.

Roger, Houston.

Apollo 7. We're going to pass - the present plans now are to pass the three NAV loads up to you - send three NAV loads up to you over Texas. Can you tell me how your last P52 came out?

Roger. Jack, the P52 came out fine. We got five balls star difference and ... No problem with the optics. There will be ... and all came out fine.

Okay. That's real good news. We'll expect you to be in POO sometime around 25 33 for these command uploads here.

Fine.

Okay. One other message here this morning: the flight of Apollo 7 dominates the news this morning. We received a number of special messages regarding the flight, including one from President Johnson, who watched the launch.
on television at the White House. Here is his message to you. "Congratulations on the splendid beginning of this Apollo 7 flight. The nation is proud of you and the many in NASA, the services, and the private companies which have combined to make such a successful manned space flight. Everything in the President's office came to a halt as I and the Foreign Minister, Debret, of France watched with mounting excitement the magnificent launch of the Saturn IB. You can well imagine the great pleasure which filled the room as word came of your successful insertion into orbit. The path to the moon takes courage, ability, and devotion to our goal. You are making a major stride in this star-studded way." Also, we received another message from Vice-President Humphrey, the Head of the Space Council, which says that the nation is proud of Apollo 7. Also, the Olympic Games start today in Mexico City. We'll keep you posted on the result.

Roger. Thank you.

Roger.

Hey, Jack, I just finished the CRYO fuel G test for the oxygen tanks at the 90-percent level, and it looked like there was very noticeable
stratification at 910 psi. When I turned the heaters off and the fans on, the surface dropped in the left tank down to 860 and the right tank down to 850. All heaters and fans are back on AUTO now.

01 01 19 29    CC    Okay. Roger. We copy.
01 01 19 33    CDR    Jack, we look very good up here, and we've had our little crises, but ...
01 01 19 43    CC    Roger. Thank you.
01 01 19 45    CDR    Jack, we just had a program alarm 1105 down-link 25. Could you have somebody check that out for us?
01 01 19 53    CC    Okay. We copy that. We'll check it out.
01 01 19 56    CDR    Roger.
01 01 26 52    CC    Apollo 7, Houston.
01 01 26 55    CMP    Roger.
01 01 26 57    CC    Roger. Donn, we would like you to key in ENTER so that we can look and see whether there were any additional program alarms.
01 01 27 08    CMP    Okay. Jack, I did, and nothing came up.
01 01 27 11    CC    Okay. Real fine.
01 01 29 03    CC    Apollo 7, Houston.
01 01 29 06    CMP    Go ahead, Houston.
01 01 29 08    CC    Roger. If you will hit the RESET button, we can get rid of that program alarm 1105.
01 01 30 13 CC  Apollo 7, Houston.
01 01 30 16 CMP  Go ahead, Jack.
01 01 30 17 CC  Roger. If you will go to ACCEPT, we will send you up those three updates.
01 01 30 23 CMP  Roger. You got it.
01 01 30 25 CC  Okay.
01 01 31 08 CC  Apollo 7, Houston. I have the MCC1 maneuver update that I'd like to give you whenever you're ready to copy.
01 01 31 20 CMP  Understand. This is an improvement on the last one?
01 01 31 22 CC  Yes, sir.
01 01 31 23 CMP  Ready to copy.
01 01 31 25 CC  Roger. MCC1 026 24 5520 plus 00635 minus 00013 plus 019 63 1961 plus 1252 019 62 32339 minus 090 minus 030 010 35 19 92 162 025 42 all balls plus 2756 minus 05340 1225 358 285 359. Remarks: posigrade, pitch down 70 degrees, heads up.
01 01 32 48 CMP  Roger. Readback follows: MCC1 026 24 5520 plus 00635 minus 00013 plus 019 63 1961 plus 1252 019 62 32339 minus 090 minus 030 010 35 19 92 162 025 42 all balls plus 2756 minus 05340 1225 358 285 359. It's a posigrade, pitch down 70 degrees, heads up.
Over.
Roger. That's correct. Thank you.

Houston, Apollo 7.

Go ahead.

Apollo 7, Houston. Go.

Roger. Were you trying to send us some piano music then?

Yes, we were trying to send you a NAV update for the CSM and target. And, 7, your sextant star check will not be visible after 26 plus 18 plus 00.

Roger. Twenty-six plus 18. Say, can you work up one for the COAS?

Roger. Stand by.

Apollo 7. There was no COAS star available at that attitude.

Roger.

Apollo 7, Houston. Our NAV loads are in and verified; the computer is yours.

Roger. We've got it. Thank you.

And, Jack, we'll be standing by for when we go ahead and restow the cabin gas analyzers and have it out of our way.

Roger.

Apollo 7, Houston. You can go ahead and stow the cabin gas analyzers.

Roger. Thank you. I'll give you one final reading.
01 01 37 16  CC  Okay.
01 01 37 41  LMP  Do you receive, Jack, 210?
01 01 37 44  CC  Say again.
01 01 37 47  LMP  210 mm of mercury.
01 01 37 49  CC  Roger. Copy.
01 01 41 56  CC  Apollo 7, Houston. Opposite cam.
01 01 42 10  CC  Apollo 7. One minute LOS.

CANARY (REV 17)
01 01 48 59  CC  Apollo 7, Houston through: Canary. Standing by.
01 01 49 03  CDR  Roger. We'll try to give that attitude now.
01 01 49 06  CC  Roger. Could we get you to switch the BIOMED
switch to the LMP?
01 01 49 14  CDR  You say I'm kind of dull today? You've got it.
01 01 49 19  CC  Roger. Thank you.
01 01 49 21  CDR  We're still in 8 hours of our prime time.
01 01 49 24  CC  Roger.
01 01 50 22  CC  7, you're 1 minute LOS; we'll pick you up at
Ascension in about 3 minutes.
01 01 50 27  CDR  Roger. We're in good shape here.

ASCENSION (REV 17)
01 01 53 51  CC  Apollo 7, Houston through Ascension. Standing
by.
01 01 53 56  CDR  Roger.
01 01 55 57  CC  Apollo 7, Houston. One minute LOS; pick you
up at Tananarive in 10 minutes.
01 02 06 23  CC  Apollo 7, Houston through Tananarive. Standing by.
01 02 06 43  CC  Apollo 7, Houston through Tananarive.
01 02 06 47  CDR  Roger, Houston. How do you read?
01 02 06 49  CC  You're five-by. We're standing by.
01 02 06 51  CDR  Roger. Checking our sextants.
01 02 06 54  CC  Roger.
01 02 07 57  IMP  ... less than one-half.
01 02 08 03  CC  Roger. We copy.
01 02 13 24  SC  ... 
01 02 13 43  CC  Apollo 7, Houston. You're 1 minute LOS Tananarive. We'll pick up ARIA 2 in about 2 minutes; have continuous coverage through Carnarvon.
01 02 13 53  CDR  Roger. ...
01 02 14 02  CC  Roger. I couldn't copy that, Wally.
01 02 14 04  CDR  Roger. I better go through ...
01 02 14 08  CC  Roger.
01 02 14 09  CDR  Keep coming down live to you.
01 02 14 11  CC  Okay.

ARIA 2 (REV 17)
01 02 15 35  CC  ARIA 2, go REMOTE.
01 02 16 30  CC  Apollo 7, Houston through ARIA 2. Standing by.
01 02 17 05  CC  Apollo 7, Houston through ARIA 2. Standing by.
01 02 17 12  SC  ...
01 02 17 15  CC  Roger. Copy.
01 02 17 23  CC  ARIA 2 has AOS. ARIA 2 has AOS.
01 02 19 17  SC  ...

CARNARVON (REV 17)
01 02 22 42  CC  Apollo 7, Houston.
01 02 22 45  SC  Roger. ...
01 02 22 47  CC  Roger. I will give you that time hack at T minus 2 minutes.
01 02 22 51  SC  Roger.
01 02 22 53  CC  Two, one.
01 02 22 55  CC  MARK.
01 02 22 56  CC  T minus 2 minutes.
01 02 22 58  CDR  Very good.
01 02 22 59  CC  FDAI scale 55.
01 02 23 01  CC  DELTA-V sets A and B, normal.
01 02 23 04  CMP  A normal, B normal.
01 02 23 09  CC  Hand control ON.
01 02 23 13  CMP  Roger. ON.
01 02 23 14  CC  Number 2, standing by for 30 seconds.
01 02 23 17  CMP  Roger.
01 02 23 50  CMP  ... And standing by for 30.
01 02 23 56  CC  Minus 6C.
01 02 23 58  CMP  Roger.
01 02 24 26  CMP  Thirty seconds.
01 02 24 28  CC  EMS, DELTA-V on AUTO.
01 02 24 30  CMP  AUTO.
01 02 24 31  CC  Roger. Full charge in 15 seconds. You hitting
when you have 5 seconds, Donn?

01 02 24 34  IMP  Roger. I'll hit the ENTER.

01 02 24 38  CC  You have got one count on the PIPA.

01 02 24 40  SC  ...

01 02 24 45  CC  Ten, nine, eight, seven, six, five, four, three,
two, one, zero.

01 02 24 57  CDR  Tested. Like a bomb, yabedabadoo! Great, man!
That's like a ride and a half down there, gang.

01 02 25 13  CC  Roger. Copy that.

01 02 25 17  CC  Spacecraft control SP-3.

01 02 25 20  SC  I switched gimbals, Walt.

01 02 25 38  LMP  Get ready for DELTA-V correction.

01 02 25 58  LMP  Burning left 1.2, burning up 1.9, and we burn
aft 2.4.

01 02 26 06  CC  Roger. Copy that.

01 02 26 33  LMP  Roger. We are burning down to plus four balls 1,
minus four balls 3, plus four balls 4. We are going to quit here.

01 02 26 42  CC  We copied real fine.

01 02 26 44  CDR  Recounter residuals minus nine plus nine.

01 02 26 48  CC  Roger. Copy that.

01 02 26 53  CDR  Gimbal motors are all OFF. Circuit breakers
OPEN. ... direct OFF, LC OFF.

01 02 27 13  CDR  Houston, Apollo 7.

01 02 27 15  CC  Go ahead.
Give you a plus one on that. That's a real kick in the center. That really socked it to you.

Roger.

A very sudden start that's like a hydraulic catapult - almost like a steam cap.

Okay. I can't help you out on any comparison there, Wally.

This is Apollo 7. We are now drying off our hands.

Roger. (Laughter)

You are about 30 seconds to LOS in Carnarvon.

We will pick you up at Hawaii in about 18 minutes.

Roger.

Everything looked real fine down here.

Did up here ... Surprised at the instantaneous start.

Roger.

ARIA 3 (REV 17)

ARIA 3. Go REMOTE.

Apollo 7, this is Houston. We will be monitoring through ARIA 3 at this time.

ARIA 3 (REV 17)

Apollo 7, through Hawaii. Standing by.

Roger. Jack, I just did a preliminary T dash 20
to look at the booster, and I think I saw it, but it was a little hard to tell because of all the debris I've been picking up since sunrise. ... point light source, and I'm sure that is it. Like I said, there is a lot of trash and debris ... it's kind of hard to tell.

Okay. Roger. We copy that, Donn.

**GOLDSTONE through ANTIGUA (REV 17)**

01 02 49 08  CC  Okay. Roger. We copy that, Donn.

01 03 01 43  IMP  Hello, Houston, Apollo 7. Do you read?

01 03 01 46  CC  Read you five-by, 7.

01 03 01 56  CC  Apollo 7, Houston.

01 03 01 58  IMP  Roger. At 27 hours into the flight, we're fixing to take some pictures of the ...

01 03 02 08  CC  Roger. Understand. And, Walt, over Texas in about 3 minutes, we're going to have three NAV loads that we'd like to send you. There will be no NCC2 maneuver, and I'll pass you your maneuver PAD as soon as I get it.

01 03 02 29  IMP  Roger. Waiting and ready.

01 03 02 34  IMP  About 3 minutes, we got a completion statement.

01 03 05 21  CC  Apollo 7, Houston. We would like to send you your three up posts. Would you go to ACCEPT, please?

01 03 05 28  CDR  ACCEPT. We are in ACCEPT.

01 03 05 33  CC  Roger. Copy. Coming up.
Apollo 7. Proceeding down trip to direct Houston.

Roger. Copy.

Hey, Jack, when we go past Houston, run outside and wave, will you. We want to look at you in the sextant.

And when you get back in, Jack, why don't you have the EECOM take a look at the performance of the fuel values and if they are matching up my performance curves.

Say again about the fuel cells, Walt.

How about having someone take a look at how they are doing with the specs on the performance curves. Looks a little low to me.

Okay. Will do.

Apollo 7. Just cleared New Orleans; going direct to Orlando.

Roger. Copy.

Apollo 7, Houston. I have your NSR PAD that I'll give to you whenever you are ready.

Ready to copy. Go.

Roger. NSR 028 00 5000 minus 00927 plus 00013 minus 01486 1536 plus 1139 01649 31599 minus 086 minus 040 008 NA NA 027 17 0000 plus 1959 minus 055534 1750 001 096 000. Remarks: retrograde pitched up 55 degrees, heads down.
I pose here - I think you're giving an NA for each line.

Roger. Let me read after the burn time. Burn time is 0 plus 08 NA NA NA. Do you want - did you get copy NOUN 34 NOUN 43?

Did not.

Okay. 027 17 all balls plus 1959 minus 0553
1750 001 096 000. I have a correction on the NOUN 33 time. That should be - the second should read 5600.

Roger. Readback follows: MSR 028 00 5600 minus 00927 plus 00013 minus 01486 1536 plus 1139 01649 31599 minus 086 minus 040 008 no sextant star 027 17 0000 plus 1959 minus 0553
1750 001 096 000 retrograde pitched up 55 heads down. Over.

GOLDSTONE through ANTIGUA (REV 18)

Roger. I have the boresight star for you. That's 045 plus 278 up 0.2 left.

Roger. Star 45 plus 278 up and 0.2 left. Where is the decimal on the up?

27.8.

27.8. Thank you.

Jack, do you mean 27. or 2.78?
27.8.

Thank you.

Houston, Apollo 7. We completed a series of photographs from the Hawaiian Islands across the Gulf Coast, Houston, New Orleans, St. Petersburg, Tampa, Orlando, Cape Patrick, into the Grand Bahamas ...

Wally, you were a little bit garbled. I didn't catch you.

Roger. We continued from the Hawaiian Islands, across the Gulf Coast, through Florida to Grand Bahama on magazine Peter at that time, P as in Peter.

Oh, Roger. Copy that now.

Okay.

... across the Gulf Coast today.

Apollo 7. All three loads are in and verified. Computer is yours.

We've got it. Thank you.

Apollo 7, Houston. One minute LOS; we'll pick you up at Ascension in 5 minutes.

Roger.

ASCENSION (REV 15)

Apollo 7, Houston through Ascension.

Roger. Would you mark 20 clicks of water for CDR? Over ...
01 03 25 50  CC  How many clicks of water?
01 03 25 52  IMP  Twenty.
01 03 25 53  CC  Twenty. Roger. Copy. And on the fuel cell performance: we are finding the fuel cells are right on nominal; however, we are going to continue to monitor the performance as we go along here.
01 03 26 08  CDR  Roger. He's doing a pretty good job today.
01 03 26 12  CC  Thank you. You guys are, too.
01 03 26 15  CDR  Jack, how are we looking on our fuel budget?
01 03 26 20  CC  Could you say again, Walt?
01 03 26 21  CDR  This is Wally. How are we doing on our fuel budget?
01 03 26 26  CC  Okay. Just a minute. We'll get it right to you.
01 03 26 30  CDR  ...
01 03 26 37  CC  Wally, on the RCS budget: we think we'll be right on nominal going into TPI.
01 03 26 46  CDR  Great.
01 03 26 48  CDR  And Jack, okay, we've got our tape back now, I guess, or are we dumping it if we use another 32 pass again with no tape to log that stuff on.
01 03 26 58  CC  Okay.
01 03 34 08  CC  Apollo 7, you are 1 minute LOS Ascension; we'll pick you up in Tananarive in 8 minutes.
Apollo 7, Houston through Tananarive.

Apollo 7, Houston through Tananarive.

Apollo 7, Houston through Tananarive.

Apollo 7, Houston through Tananarive.

Apollo 7, Houston.


You are five-by now, Walt. We would like you to put your up-telemetry switch to COMMAND RESET, then NORMAL. We missed the command going out of Ascension.

Roger. Telemetry RESET and then NORMAL.

Roger. And you will be omni A for the burn.

Roger.

Apollo 7, Houston. You are 1 minute LOS to Tananarive; we pick you up over Carnarvon in about 7 minutes.

Roger. Will we be in touch during the burn?

Say again.

Will we be in touch during the burn?

Yes, sir, you will.

... pitch 2, ...

Apollo 7, Houston.

Roger. Stand by ...
CARNARVON (REV 18)

01 03 57 53 CC Apollo 7, Houston. Reading you five-by. I'll give you a MARK at 2 minutes.

01 03 57 58 SC Roger.

01 03 58 53 CC Three, two, one.

01 03 58 56 CC MARK.

01 03 58 57 SC T minus 2 minutes.

01 03 58 59 SC SCAL, scale 55. ... A and B normal, A normal, B normal.

01 03 59 12 CC End controllers ON. Standing by for 30 seconds.

01 03 59 56 CC Minus 1 minute.

01 03 59 59 SC Roger. One minute.

01 04 00 29 SC T and S DELTA-V AUTO.

01 04 00 32 CC Check.

01 04 00 36 SC Roger. That's at the count of four, five now ...

01 04 00 46 CC Ten, nine, eight, seven, six, five, four, three, two, one, zero.

01 04 00 57 CC Testing. —

01 04 00 58 SC Furn complete, all four balls - out.

01 04 01 12 CC Roger. Copy.

01 04 01 16 CMP DELTA-V thrust A and V OFF.

01 04 01 18 CDR Roger. Pitch 1 OFF, yaw 1 OFF, pitch 2 OFF, yaw 2 OFF.

01 04 02 28 CMP Residuals are plus four balls 1 plus five balls plus four balls 2, and we burnt about a total of 6 feet per second. ...
Roger. Copy.

Residuals minus 9.9.

Okay. Copy that.

... 

Same exact number.

... 

Houston, Apollo 7. Wish to commence battery charging on battery A; I would say a curve right now of about 2.3.

Roger.

Apollo 7, Houston. We're about 1 minute LOS Carnarvon. In 2 minutes, we'll pick up ARIA 3 for about 10 minutes monitor pass, and going over the hill here, it looks like a real good burn.

Roger.

ARIA 3 (REV 18)

Apollo 7, Houston through ARIA 3. Standing by.

Roger. Thank you.

GUAM (REV 18)

Apollo 7, Houston through Guam. Standing by.

Roger.

Apollo 7, Houston. One minute LOS Guam; Hawaii in 6 minutes.

Roger.

Roger. Jack, I've got the target instructions;
it seems to be tracking pretty smooth now. I loaded in 29 hours, 20 minutes for first cutoff, TPI, and I got 29, 20, and 29 seconds back. Not too bad for a start.

Not too bad.

HAWAII (REV 18)

Apollo 7 through Hawaii. Standing by.

Thank you.

Jack, I've got about 8 minutes here ... The thing is really taking in there, right on the money.

Roger. You're fading in and out, but I think I got it. You're tracking okay.

HUNTSVILLE through ANTIGUA (REV 18)

Huntsville two-way lock, out of range.

Houston, Apollo 7.

Apollo 7, Houston. Go ahead.

Why can't we get the RECORD mode here? Donn has got a lot of comments he ought to be putting on tape.

Thank you.

... Are you recording this down there?

Are we recording?

Roger. I'm almost 3 minutes into this TPI solution here, and it seems like quite awhile. I was wondering when you are planning to take it off.
Roger. Donn, we're trying to mark the polar
plot along with you here as you go through the
solution.

Whenever we call P34 or some such thing, you
can expect it to drop the tracking or move off
some, and then it will return after you get
back to the basic program. For instance, the
P34 solution just came back, and before we got
it ... target ... Also, I did an attitude
maneuver of 3 or 4 degrees a minute ago
which kind of started me ...

Roger.

Apollo 7, Houston.

Roger.

Roger. Walt, we'll have a clean tape for you
to record the rendezvous on at Antigua LOS
which occurs about 28.54.

Roger. 28.54.

Roger.

HUNTSVILLE through ANTIGUA (REV 19)

Apollo 7, Houston. I have you TPI update PAD.
I will give you when you are ready to copy.

Ready to copy. Go.

Roger. 029 163400 plus 150 plus 019 minus
075, 168/46 forward, 020/11 right, 003/03 down,
01 04 50 20 IMP 075/08, 01960 minus 0729 02240 35950 133 trunnion check. The GET of midcourse 029 plus 23 plus 00. Remarks: you will be flat at TPI. Roger. That's flat at TPI midcourse. 029 plus 23 plus 00, TPI update follows: 029 183400 plus 150 plus 019 minus 075 168 46 forward 020 11 right 003 03 down 075 08 01960 minus 0729 minus 0240 35950 133 on the trunnion. Over.

01 04 50 57 CC Roger. Your elevation minus 5 minutes, I copy; it should be 02240.

01 04 51 08 IMP In that - oh - 02240.

01 04 51 12 CC Roger. Everything else correct. I'll give you a DELTA-V M cutoff in a minute.

01 04 51 19 CC Your DELTA-V M cutoff will be 90.

01 04 51 22 LMP Ninety, read.

01 04 53 02 CC Apollo 7, Houston.

01 04 53 06 IMP Go ahead.

01 04 53 07 CC Roger. Walt, you have a clean tape on the DSE. You should have three switches in proper position there. TELEMETRY INPUT should be HIGH. Your FORWARD REWIND switch should be OFF, your UP-TELEMETRY switch - COMMAND RESET to NORMAL. When you want to record, then cycle the FORWARD REWIND switch to FORWARD, then OFF.

01 04 53 31 IMP Roger. But we don't want to be recording at PGM HIGH yet; we want to still get all the BCS burns on high bit rate. Over.
Okay. Stand by.
Okay, Apollo 7. You are GO the way you want to do it. We'll have a mixed dump, but that will be okay.
Roger. Do you understand that I'll be going - I'll be stopping the tape and going to high bit rate for each of the RCS burns; and after the last RCS burn, I'll run at high bit rate right on into the rendezvous till the tape is up?
Roger. We understand that.
ASCENSION (REV 19)
Apollo 7, Houston through Ascension. Standing by.
Roger.
Apollo 7, Houston.
Apollo 7, Houston.
Go ahead, Houston.
Just for your information only, the tracking data across the States indicates that TPI could occur about 30 seconds earlier. All our other values remain unchanged.
Roger.
Roger. We show 16 plus 45 on our solution.
Roger.
01 05 05 40  CDR  I'll give you MARK at 11 now, 7. I'll give you a MARK at 11.

01 05 05 47  CDR  MARK.

01 05 05 50  CDR  Okay. It's 28. I'll give you ten, 30, or do you want ten?

01 05 05 58  CDR  Okay.

01 05 06 04  CDR  Thirty-five seconds.

01 05 06 38  CC  Ten seconds, three, two, one.

01 05 06 48  CDR  MARK.

01 05 07 31  CDR  Are they good numbers?

01 05 08 12  CC  Apollo 7, Houston. Tananarive in 10 minutes.

TANANARIVE (REV 19)

01 05 19 37  CC  Apollo 7, Houston through Tananarive. Standing by.

01 05 19 41  CDR  Roger. ...

01 05 19 44  LMP  ...

01 05 20 38  CC  Walt, we've got real bad COMM here at Tananarive. We can read you saying something, but we can't make it out.

01 05 20 47  LMP  ...

01 05 20 59  CC  We couldn't make it out. We made out the word TPI, and that was all.

01 05 21 12  CC  Can you confirm that you've burned TPI?

01 05 21 15  LMP  ... yes.

01 05 21 17  CC  Roger. We got it. Thank you.

01 05 21 40  SC  This is Apollo 7. Three, two, one.
Apollo 7, Houston. We are 1 minute LOS Tananarive. We'll pick you up for a short pass at Carnarvon in 9 minutes.

CARNARVON (REV 19)

Apollo 7, Houston through Carnarvon. Standing by.

Roger.

7. One minute LOS; Guam in 7 minutes.

Roger. Coming up the pike.

Roger.

... flight midcourse requires no corrections.

Real fine news.

GUAM (REV 19)

Apollo 7, Houston through Guam. Standing by.

Apollo 7, Houston. One minute LOS Guam; Hawaii in 8 minutes.

Roger. We're closing at about 7 or 8 feet, and we're just about locked up initially.

Real fine, Wally.

... is between 50 and 60 feet per second. At this point, we're just essentially a moving station, moving in slow.

Real fine.

HAWAII through GUAMAS (REV 19)

Apollo 7, Houston over Hawaii.
01 05 59 30 IMP  Go ahead. Roger. We're - I guess we're within about 150 out of ten million in random direction.

01 05 59 38 CC  Roger. Understand.

01 05 59 43 IMP  ... 

01 05 59 52 CC  We got some poor COMM this time, Walt. We will stand by a little bit until we get in a little closer.

01 06 00 02 IMP  We'd like a little more information on station-keeping with the S-IVB.

01 06 00 13 CC  Roger. We copy stationkeeping.

01 06 00 35 CC  Apollo 7, Houston. How do you read now?

01 06 00 33 IMP  Loud and clear, Jack. Go.

01 06 00 40 CC  Okay. You are real fine now, Walt; we have just switched to S-band.

01 06 00 44 CMP  Okay. This is Donn. Everything was pretty nominal as far as the solutions were concerned.

We had a DSKY solution of 3.6 to the midcourse, and Walt had a 1.7 solution on his charts. We split the difference and did 2 feet per second aft and then slid us right in there; and except for a little bit of cross plane correction that Wally had to make at the tail end, we were nominal right up the pike. According to MOUN 40 estimates of fuel use, we used 76 feet per second. However, MOUN 40 integrates velocity
even when you are not thrusting, so I think we used somewhat less than that, probably on the order of 60 to 65 feet per second.

Roger. Copy that.

Roger. On PCM high data, we had a loss of contact with the S-IVB just prior to TPI; and in the confusion here, I didn't get high bit rate data. The TPI burn - we had high bit rate data in the midcourse burn and the final RCS thrusting on in.

Okay. Copy that.

And, Walt, I have your separation PAD whenever you are ready to copy that.

Wait one.

Apollo 7, Houston. How close are you now?

Pretty close, at about - oh, at about 70 feet. It's tumbling rather wildly, so we are starting to stay away from it.

Roger. Understand.

Ready to copy, Jack. Go.

Okay. Separation PAD: 030 20 all balls NOUN 82 NA 1618 plus 1221 00020 30847 NOUN 48 NA 0 plus 05. Sextant star angle NA NOUN 34 NA NOUN 43 NA 359 310 000. Remarks: It will be a postgrade burn, HIF, heads down using minus X thrusters; the burn will take place in front of the booster.
The SLA panel – the SLA panel on the opposite side of one large sphere is sticking out of the engine. It does not have a flashing light, and the other three are working fine.

Roger. Copy.

What were the minutes on the GETI? I missed the minutes.

Okay. Minutes on GETI 20.

Roger. Readback follows. You were a little garbled at times. Check close, SEP burn 030 20 0000 1618 plus 1221 00020 30847 005. All the way down to roll, pitch, and yaw 359 310 000. Over.

Roger. That's correct. Did you copy the remarks?

Roger. Posigrade BDP, heads down, minus X thrusters, from in front of the booster.

Roger. And, Walt, on your charging of battery A –

Say again.

On charging battery A, we'd like you not to stop charging –

Say again, Jack.

Apollo 7. Do you read? Houston.

Roger. I am reading you. How me?
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 06 04 61</td>
<td>CC</td>
<td>You're five-by.</td>
</tr>
<tr>
<td>01 06 04 43</td>
<td>IMP</td>
<td>What was your last question after my readback?</td>
</tr>
<tr>
<td>01 06 04 47</td>
<td>CC</td>
<td>We do not want you to discontinue charging battery A at .6 amps. We'll give you a cutoff charge.</td>
</tr>
<tr>
<td>01 06 04 56</td>
<td>IMP</td>
<td>Roger. I copied below that.</td>
</tr>
<tr>
<td>01 06 04 58</td>
<td>CC</td>
<td>You'll continue charging. We'll give you a cutoff time.</td>
</tr>
<tr>
<td>01 06 05 02</td>
<td>IMP</td>
<td>I'll be standing by for your cutoff later.</td>
</tr>
<tr>
<td>01 06 05 04</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>01 06 12 53</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 06 12 55</td>
<td>IMP</td>
<td>Go ahead, Houston.</td>
</tr>
<tr>
<td>01 06 12 56</td>
<td>CC</td>
<td>Roger. We feel you're at the end of your tape on your DSE. If you concur, we'll take command, and we'll dump it, and you can go back to your normal switch configuration.</td>
</tr>
<tr>
<td>01 06 13 10</td>
<td>IMP</td>
<td>Roger. We concur.</td>
</tr>
<tr>
<td>01 06 13 11</td>
<td>CC</td>
<td>Okay. We're gonna dump.</td>
</tr>
<tr>
<td>01 06 14 31</td>
<td>IMP</td>
<td>Houston.</td>
</tr>
<tr>
<td>01 06 14 39</td>
<td>IMP</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>01 06 14 40</td>
<td>CC</td>
<td>Go ahead, 7.</td>
</tr>
<tr>
<td>01 06 14 42</td>
<td>IMP</td>
<td>That's a real nice setup on the ground. Your solution and ours were pretty close; you did a real good job.</td>
</tr>
<tr>
<td>01 06 14 49</td>
<td>CC</td>
<td>You all did a real fine job, too.</td>
</tr>
<tr>
<td>01 06 14 51</td>
<td>IMP</td>
<td>Very good.</td>
</tr>
</tbody>
</table>
That's what we call teamwork.

Roger. That's a fact.

Hey, Apollo 7.

Apollo 7. Go.

Apollo 7, Houston. Go.

Stand by one.

TENJAS (REV 19)

Apollo 7, CAP COMM.

Apollo 7. Opposite omni.

Apollo 7, CAP COMM.

Apollo 7. Go.

Roger. Congratulations on a great job up there.

Thank you; we're... today.

Yes, listen; we need a commitment on REV 45 and sub relative to TV from here on.

Roger. We'll go along with that. We were awfully busy up here and behind when we started out this morning; we had to cut you off.

Roger. Okay. And you are okay from 45 on.

Is that correct?

Yes, it is.

Okay. Fine. Thank you.

Real job, but we did them all within the period, and the range really came up beautiful today.

Roger. Okay. Have fun. We will see you later.

Okay. Thank you.
Apollo 7, Houston. You are 1 minute LOS Texas; we will pick you up at Tananarive in 34 minutes.

Roger. Ready to go.

Roger.

I know it will take awhile for you to dump that tape; give us a call if you have the first tape ready.

Okay, 7. It's gonna take a little while to get the tape dumped. KECOM will let us know when they're ready, and we'll tell you when you can use it again.

TANANARIVE (REV 20)

Apollo 7, Houston through Tananarive.

Apollo 7. Roger.

Roger. Your voice is pretty good this time.

Between your chow there, I've got a block data number 4 to give you.

Ready to copy. Go.

Say again. You are ready to copy?

Go ahead.

Roger. 021 dash 4 Alfa plus 260 minus 1633 032 plus 53 plus 42 4933, 022 dash 3 Bravo plus 317 plus 1388 034 plus 13 plus 54 4523, 023 dash 3 Alfa plus 295 plus 1385 035 plus 49 plus 27 4775, 024 dash 3 Bravo plus 233 plus 1356 037 plus 24 plus 28 5013, 025 dash Alfa Charlie minus 021.

Wait one, skipped GET: 038 plus 14 plus 11 4342.
01 06 57 25  CC  Apollo 7, Houston. On your longitude for area
25 Alfa Charlie.

01 06 57 34  CDR  Area 25 Alfa Charlie, I got lat minus 021 and
no longitude.

01 06 57 40  CC  Roger. Longitude minus 0180. Area 026 dash
Alfa Charlie plus 090 minus 0240 039 plus 49
plus 27 4159. Houston, over.

01 06 58 16  CDR  Roger. Houston. 021 dash 4 Alfa plus 260 minus
1633 032 plus 53 plus 42 4933,022 dash 3 Bravo,
and I didn't get plus or minus on this. 317
plus 1388 034 plus 13 plus 54 4623.

01 06 58 47  CC  Roger. Your latitude is —

01 06 58 48  CDR  023 dash 3 Alfa plus 295 plus 1385 035 plus 49
plus 27 4775,024 dash 3 Bravo plus 233 plus
1356 037 plus 24 plus 28 5013,025 dash Alfa
Charlie minus 021 minus 0180 038 plus 14 plus 11
4342,026 dash Alfa Charlie plus 490 minus 0240
039 plus 49 plus 27 4159. Over.

01 06 59 35  CC  Roger. Your latitude on area 223 Bravo is
2 plus 317.

01 06 59 42/  CDR  Everything else correct.

01 06 59 45  CC  Everything up correct.

01 06 59 57  CC  Just about LOS there, Wally. You and Donn, we
would like to have you do some troubleshooting
on the BIOMED harness there when you get a chance,
and maybe we can pick it up over Mercury.
Roger. ... rendezvous.

Roger.

... around. If you get a readout, we'd like to hear how much RCS propellant we have left...

Affirmative. Go.

... Do you have it for us?

Apollo 7, Houston.

MERCURY through GUAM (REV 20)

Apollo 7, Houston. I have a flight plan update.

Roger. Wait one.

Should we use the flight plan or use the log book?

Say again, Walt.

Did you plan to use the flight plan, or do we need the log book?

No, it's just one line. At time 33 30, the fuel cell purge of the O₂ only.

Purge the O₂ only of the fuel cell purge, and it has to be checked at the scheduled time. Right?

Roger. It's at the same time, at 33 30.

It's duly noted.

A rundown to date due on our window status, the center hatch window now is pretty badly blurred, I would say, useful only to detect the horizon.

Roger. You say it's hard to detect the horizon?
01 07 19 15  CDR  Negative. It is just barely usable for detecting the horizon, rather than looking through it. It would be usable for bank angles, and that's about all.

01 07 19 26  CC  Roger.

01 07 19 29  CDR  My left window, what I call my number 1 window -

01 07 19 33  CC  Roger.

01 07 19 34  CDR  - is now developing a film on the inner surface of the outer pane.

01 07 19 45  CDR  Although it's not too bad at this point, I would not shoot pictures through it.

01 07 19 53  CC  Roger. Copy.

01 07 19 55  CDR  I'll go on around the cockpit. The number 2 window, the one we use for rendezvous, is beautiful. And interestingly enough, small hairs like a fuzz, around the perimeter of all the windows that apparently just developed as a sort of dust, it's about three-quarters of an inch to an inch long.

01 07 20 24  CC  Roger. Is that on all windows or just the -

01 07 20 28  CDR  That's on all windows, and I'm now over to number 4 window. It does have the same dust, and it's getting a little bit cloudy but only around the perimeter on the upper right corner, as you would think of the upper and lower with the X-axis horizontal.
<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 07 20 49</td>
<td>CDR</td>
<td>It looks like the number 4 window may occlude out after a few more days.</td>
</tr>
<tr>
<td>01 07 20 55</td>
<td>CC</td>
<td>Roger. Looks like number 4 may occlude out after 3 or 4 more days, right?</td>
</tr>
<tr>
<td>01 07 21 00</td>
<td>CDR</td>
<td>Roger. Number 5, I had to cello it now - it has a slight film on the inner surface. We'll be standing by for IFR.</td>
</tr>
<tr>
<td>01 07 21 12</td>
<td>CC</td>
<td>Yes, sounds like it.</td>
</tr>
<tr>
<td>01 07 21 15</td>
<td>CDR</td>
<td>Naturally, we'll keep you updated on this, and we'll discuss where we're going.</td>
</tr>
<tr>
<td>01 07 21 20</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>01 07 21 22</td>
<td>CDR</td>
<td>Affirmative. The target was visually fixed during the final stage of braking about midway between Betelgeuse and Sirius on a line drawn between the two stars.</td>
</tr>
<tr>
<td>01 07 21 44</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>01 07 21 47</td>
<td>CDR</td>
<td>And it's a very traumatic experience.</td>
</tr>
<tr>
<td>01 07 21 50</td>
<td>CC</td>
<td>Sounds like it was a good one.</td>
</tr>
<tr>
<td>01 07 21 54</td>
<td>CDR</td>
<td>We arranged for an update, and I think John Young was on a while ago, on our fuel remaining, just to give us an academic theory.</td>
</tr>
<tr>
<td>01 07 22 05</td>
<td>CC</td>
<td>I'll check.</td>
</tr>
<tr>
<td>01 07 22 07</td>
<td>LMP</td>
<td>... to pass on or maybe get fixed for subsequent spacecraft. On panel C52, the QD that we hooked to the waste water servicing valve: that QD, after it's installed, provides interference with storage area B8 such that B8 cannot be</td>
</tr>
</tbody>
</table>
opened and gotten into without taking down the QP again.

Roger.

There's something I think we ought to make note of, Ron. The lightweight headsets are preferable to the COMM carriers due to the comfort of not having anything on your head but the plugs in our ears. We're using the plastic plugs rather than the rubber type nipples.

You're using your own molded plastic plugs, right?

That's affirmative.

Roger. From our calculations on the RCS fuel down here, it looks like it was pretty much nominal. We used the nominal plus a portion of the reserve, and so you're about right on. We're standing by for a further temperature stabilization to get a more accurate picture of it.

Roger.

On your tape recorder, as you know, we've recorded a lot of high bit rate and not too many places to dump it. It's going to take about three revs. So you'll have no voice recording on your tape recorder for awhile. We'll let you know when it's available for use again.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 07 23 44</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>01 07 24 01</td>
<td>CC</td>
<td>Wally, we'd like to get an indication of how you're feeling up there and if the Actifed did you any good.</td>
</tr>
<tr>
<td>01 07 25 22</td>
<td>CC</td>
<td>Apollo 7, Houston. About 1 minute to LOS Guam.</td>
</tr>
<tr>
<td>01 07 25 26</td>
<td>CDR</td>
<td>Roger. I didn't give an answer on the Actifed or aspirin. You were cut out.</td>
</tr>
<tr>
<td>01 07 25 37</td>
<td>CC</td>
<td>Roger. I need to get an idea of how you feel then if the Actifed was working. Do you have any further symptoms?</td>
</tr>
<tr>
<td>01 07 25 46</td>
<td>CDR</td>
<td>My mucus is much thicker, and I think I probably should continue on Actifed and use aspirin when I go to sleep at night.</td>
</tr>
</tbody>
</table>

HAWAII through HUNTSVILLE (REV 20)

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 07 36 10</td>
<td>CC</td>
<td>Apollo 7, Houston through Hawaii.</td>
</tr>
<tr>
<td>01 07 36 16</td>
<td>CDR</td>
<td>Roger. We're recording you on humidities.</td>
</tr>
<tr>
<td>01 07 36 20</td>
<td>CC</td>
<td>Say again.</td>
</tr>
<tr>
<td>01 07 36 22</td>
<td>CDR</td>
<td>Roger. We're - hygrometer.</td>
</tr>
<tr>
<td>01 07 36 27</td>
<td>CC</td>
<td>Roger. Understand.</td>
</tr>
<tr>
<td>01 07 36 31</td>
<td>CMP</td>
<td>Go ahead. We're standing by.</td>
</tr>
<tr>
<td>01 07 36 36</td>
<td>CC</td>
<td>Wally, we're just a little curious if you have had any indications of a fever at all?</td>
</tr>
<tr>
<td>01 07 36 44</td>
<td>CDR</td>
<td>Negative. I took my temperature. It's normal, and we've done the hand-holding bit on the forehead, and it just appears that the nasal passage is very full. I haven't been coughing. There's nothing in the lungs.</td>
</tr>
</tbody>
</table>
01 07 37 04 CC Roger.
01 07 37 07 CDR I'd prefer to dry it up if I could, and I believe that the decongestant is my best bet.
01 07 37 20 CC Wally.
01 07 37 21 CDR Go.
01 07 37 22 CC We would like for you to go ahead and stay on the Actifed and continue with the aspirin then.
01 07 37 26 CDR Roger. What's the frequency of the usage?
01 07 37 33 CC Stand by.
01 07 37 36 CDR Say again.
01 07 37 44 CC The Actifed once every 8 hours.
01 07 37 48 CDR Roger.
01 07 37 57 CC Wally, aspirin can be as often as two every 4 hours if desired.
01 07 38 02 CDR Roger. Thank you for your help.
01 07 38 10 CDR I'll follow that schedule until we land, we run out, or I feel better.
01 07 38 19 CC Pretty hard to read that time, Wally.
01 07 38 21 CDR Roger. I'll follow that schedule until we land, run out, or feel better.
01 07 38 27 CC Roger. Concur.
01 07 42 26 CT Huntsville LOS.
01 07 46 55 CC GUAYMAS (REV.20)
01 07 46 55 CC Apollo 7, Houston. One minute to LOS. We'll pick you up Tananarive at 32 plus 27.
<table>
<thead>
<tr>
<th>Time</th>
<th>SC/CC/CDR</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01:07:47:13</td>
<td>SC</td>
<td>Roger.</td>
</tr>
<tr>
<td>01:07:47:23</td>
<td>SC</td>
<td>That's 32 plus 37?</td>
</tr>
<tr>
<td>01:07:47:27</td>
<td>CC</td>
<td>That is affirmative.</td>
</tr>
<tr>
<td>01:08:27:28</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01:08:28:10</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>01:08:28:20</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01:08:28:44</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01:08:28:54</td>
<td>CC</td>
<td>Roger. We request you terminate battery A charging at .4 amp.</td>
</tr>
<tr>
<td>01:08:29:02</td>
<td>CDR</td>
<td>Roger. .4 amp.</td>
</tr>
<tr>
<td>01:08:29:05</td>
<td>CC</td>
<td>Roger. We showed .47 amp at Guaymas. Request onboard readout this time.</td>
</tr>
<tr>
<td>01:08:29:13</td>
<td>CDR</td>
<td>Okay. We might check on are we getting my telemetry down?</td>
</tr>
<tr>
<td>01:08:29:20</td>
<td>CC</td>
<td>That's a negative telemetry on that, Tananarive.</td>
</tr>
<tr>
<td>01:08:29:24</td>
<td>CDR</td>
<td>Roger. We sorta believe we had a wire pulled out that apparently pulled out, sooner to Tananarive addition. But we'll be getting off the tape dumps beyond this pass.</td>
</tr>
<tr>
<td>01:08:29:38</td>
<td>CC</td>
<td>Roger. We should be able to get some on the Mercury at about 32 plus 50.</td>
</tr>
<tr>
<td>01:08:29:42</td>
<td>CDR</td>
<td>Understand that at 32 after we're over the hill.</td>
</tr>
<tr>
<td>01:08:29:46</td>
<td>CC</td>
<td>Say again, amp.</td>
</tr>
<tr>
<td>01:08:29:51</td>
<td>LMP</td>
<td>... and reading about .5 amp.</td>
</tr>
</tbody>
</table>
Roger. Copy -5.

Apollo 7, Ecuston. You might be advised that our last check on the voice quality of the DSR is still very good.

... Houston, Apollo 7.

Houston, Go.

Roger. We started our ECS redundant component check about 5 minutes ago, and I brought up suit compressor 2. The AC was, prior to shutting suit compressor 1 off, and at that time, I had a half amp undervoltage on main bus A and main bus B and reset okay.

Roger. Understand. When you turned suit compressor 1 off, you also had a main bus A and B undervoltage, and it reset okay.

Affirmative.

Main ... power breaking.

I had two on at ... once.

Say again, Walt.

Did you copy?

Negative on the last statement.

Had two on at once and up on the main bus A and main bus B undervoltage. I'm currently reading 27 and 1/2 volts on each main bus.

Roger. Understand.
And where is the next place where I'll be able to have you verify my main reg A and B?

Roger. We should get that at Mercury. We pick them up at 32 plus 50.

Roger. Thank you.

MERCURY (REV 21)

Houston, Apollo 7. How do you read?

Apollo 7, Houston. Loud and clear.

If you have somebody standing by, we would like to check our main oxygen rate.

Roger. We're receiving the data; continue.

Okay.

Stand by; we just lost data.

Stand by till you get data back.

Roger. That data is back in; continue.

Main reg B valve closed.

Okay. We're reading 10 - 10.

Roger. We are reading 102.

Roger. Thank you. 102.

Main reg B valve now is back ON. Main reg A valve OFF.

Apollo 7, Houston. Say again.

Standing by for your reading on the other valve.

Roger. We are reading 105.

Understand 105, thank you. Main reg A back ON.

Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 08 54 48</td>
<td>IMP</td>
<td>Are you reading Wally's BIOMED now?</td>
</tr>
<tr>
<td>01 08 54 52</td>
<td>CC</td>
<td>Apollo 7, Houston. Affirmative. It looks good now.</td>
</tr>
<tr>
<td>01 08 54 57</td>
<td>CC</td>
<td>We'll work on Donn's when he wakes up.</td>
</tr>
<tr>
<td>01 08 55 01</td>
<td>IMP</td>
<td>Exercising right now.</td>
</tr>
<tr>
<td>01 08 55 02</td>
<td>CMP</td>
<td>It's a first!</td>
</tr>
<tr>
<td>01 08 55 05</td>
<td>CC</td>
<td>Amazing!</td>
</tr>
<tr>
<td>01 08 55 08</td>
<td>CC</td>
<td>The CDR is exercising, you say?</td>
</tr>
<tr>
<td>01 08 55 12</td>
<td>IMP</td>
<td>Wally's exercising.</td>
</tr>
<tr>
<td>01 08 55 22</td>
<td>CMP</td>
<td>I think you ought to pass that on to Deke.</td>
</tr>
<tr>
<td>01 08 55 26</td>
<td>CC</td>
<td>I'll call him on the phone.</td>
</tr>
<tr>
<td>01 08 56 01</td>
<td>CC</td>
<td>Apollo 7, Houston. Number one surgeon certainly appreciates your efforts there.</td>
</tr>
<tr>
<td>01 08 56 09</td>
<td>IMP</td>
<td>Roger. The lead came apart, apparently.</td>
</tr>
<tr>
<td>01 08 56 14</td>
<td>CC</td>
<td>Roger. We understand.</td>
</tr>
<tr>
<td>01 08 56 23</td>
<td>IMP</td>
<td>Houston, Apollo 7. The ECS redundant component check is complete; we did not close secondary radiators.</td>
</tr>
<tr>
<td>01 08 57 07</td>
<td>CC</td>
<td>Roger. Understand. Did not close secondary radiators.</td>
</tr>
<tr>
<td>01 08 57 11</td>
<td>IMP</td>
<td>Also wonder if - how long we want to go with the primary boilers without trying it and possibly resorficing it?</td>
</tr>
<tr>
<td>01 08 57 21</td>
<td>CC</td>
<td>Roger. Looks like right now we're going to work on that maybe on the next shift; I don't know. Or tomorrow. You have 1 minute LOS; be</td>
</tr>
</tbody>
</table>
We will have a S-band pass over Hawaii.

33 plus 09.

Hey, Ron. This is Wally.

Go.

Do you have enough time to agree to bring the TV up?

I'm getting an update on the time, and I'll pass it up later.

Roger.

Roger. What is the time for the next TV pass and we will turn our S-band volume up till there would be a lock-on on Hawaii.

Roger. Concur.

HAWAII through HUNTSVILLE (REV 21)

Apollo 7, Houston.

Apollo 7, Houston.

Roger. Loud and clear. I understand.

Hey, sounds beautiful.

Very good.

And now would you give us an ascending node update? A chart update?

Roger. Stand by. I don't have one right now. Give you one shortly.

No rush.

And be advised on the TV usage; it's about 71 plus 10.
<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 09 10 47</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>01 09 11 17</td>
<td>CC</td>
<td>Apollo 7, Houston. There is your nodal update.</td>
</tr>
<tr>
<td>01 09 11 27</td>
<td>CDR</td>
<td>Go ahead, Houston.</td>
</tr>
<tr>
<td>01 09 11 28</td>
<td>CC</td>
<td>Roger. REV 21, GMT is 32 plus 40 plus 09. Longitude 77.1 east, right ascension 0618.</td>
</tr>
<tr>
<td>01 09 11 35</td>
<td>CDR</td>
<td>Roger. We have that. Thank you.</td>
</tr>
<tr>
<td>01 09 11 56</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>01 09 14 24</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 09 14 44</td>
<td>CC</td>
<td>Apollo 7, Houston. We will have a handover to Huntsville at 33 plus 16, so stand by for S-band volume decrease slightly before that.</td>
</tr>
<tr>
<td>01 09 15 00</td>
<td>CT</td>
<td>Hawaii here, Apollo 7.</td>
</tr>
<tr>
<td>01 09 15 06</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>01 09 15 07</td>
<td>CC</td>
<td>Houston. Go.</td>
</tr>
<tr>
<td>01 09 15 14</td>
<td>CC</td>
<td>Wally, did you copy that at 33 16 we will switch to Huntsville? And that S-band will break lock at that time?</td>
</tr>
<tr>
<td>01 09 15 21</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>01 09 15 23</td>
<td>CC</td>
<td>Houston, Apollo 7, Houston. Do you read?</td>
</tr>
<tr>
<td>01 09 15 45</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 09 15 53</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>01 09 15 55</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 09 16 03</td>
<td>SC</td>
<td>...</td>
</tr>
<tr>
<td>01 09 17 02</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 09 17 06</td>
<td>CDR</td>
<td>Roger. Ron, 7. Go.</td>
</tr>
</tbody>
</table>
01 09 17 08 CC Roger. We are back in VHF again. Missed your last comments on S-band.

01 09 17 14 CDR Roger. We have had IOM back on BIOMED as per flight plan.

01 09 17 22 CC Roger. We confirm.

01 09 19 30 CC Apollo 7, Houston. One minute AOS Tananarive at 34 plus 03.

01 09 20 48 CT Huntsville LOS.

01 10 04 34 CC Apollo 7, Houston. Tananarive standing by.

01 10 07 38 IMP Houston, Apollo 7. Do you read? Over.

01 10 07 41 CC Apollo 7, Houston. Go.

01 10 07 44 IMP Roger. We have the instrument test meter readouts for you if you've got time to take them.

-1 10 07 52 CC Roger. We have 1 minute to LOS.

01 10 07 56 IMP Forget it.

01 10 07 58 CC Roger. We'll check you on Mercury at 34 plus 25.

01 10 25 57 CC Apollo 7, Houston - Mercury.

01 10 26 23 CC Apollo 7, Houston. Opposite omni.

01 10 26 30 IMP Roger.

01 10 26 34 IMP Hey, Ron, would you identify a filter for us please? ...

01 10 26 40 CC Which one?

01 10 26 42 IMP Serial number 1002, and the number on the other side, Sugar Easy Baker 33100050 dash
206. Over.

Roger. What was your request on this?

Want you to verify if that is the 2A filter, the filter that is called out as 2A in our documentation. That is the only labeling on this filter.

Roger. A filter you say?

A filter for the 70mm Hasselblad. Over.

Roger. Copy now.

Walt, we would like some onboard readings:
your battery charger current, and the service module RCS propellant quantities.

Battery current is still reading .5 amp, and I would like to know what you have on it, and I will read you the onboard quantities in the service module RCS propellant.

Quad A is showing 58 percent. Quad B is still at 93 percent where we launched at. Quad C is 65 percent. Quad D is showing about 68 percent.

Over.

Roger. We copy, and we are reading .43 on the battery charger current.

Roger. I will continue charging, and I am still reading .5 down the line, and you can give me a call when they cease charging.

Roger. Will do.
01 10 31 23  CC  Apollo 7, Houston. Do you want your temperature corrected onboard readout for the RCS?
01 10 31 32  CDR  Affirmative. Please go with it.
01 10 31 34  CC  Roger. Alfa five six - disregard. Bravo
               Charlie six one and Delta is six four.
01 10 31 48  IMP  Five six six one six four. I have all the service test meter readouts. Are you interested in any of them in particular? I have them logged in the flight plan.
01 10 32 12  IMP  I will give you the RCS - command module RCS temperatures anyway. That is five C and D and six A, B, C, and D, all five modes except 60 C and 6A.6.
01 10 32 32  CC  Roger. We copy, and we would like the battery pressure if you have it available. And, Walt, S-band volume up at 34 plus 44.
01 10 32 46  IMP  .4 volts, and it seems to be in a standard position. We check it before we make a urine dump, and it goes right down to .6 volts; and soon as you close the dump, it goes right back up to 1.4.
01 10 33 02  CC  Roger.
               (REV 22)   HAWAII
01 10 44 58  CC  Apollo 7, Houston.
01 10 45 20  CC  Apollo 7, Houston.
01 10 45 23  CDR  Apollo 7. Loud and clear.
01 10 45 26 CC  Roger. Loud and clear. You're coming down, down. Voice back up now.

01 10 45 30 CDR  Roger.

01 10 45 36 CC  Wally, we'd like to select POO at your convenience just to update the state vector.

01 10 45 54 CDR  Houston, do you read ...?

01 10 45 57 CC  Apollo 7, affirmative.

01 10 46 00 CDR  Roger. Do you want us to give ...

01 10 46 05 CC  Say again. A little garbled that time.

01 10 46 07 SC  We'd like to give you an update. We'd like to put the sextant calibration test when we call for 36 hours and 30 minutes into Donn Eisele's wake period.

01 10 46 30 CC  Roger. Sextant calibration test. We'll see if we can't move that into Donn's wake period.

01 10 46 39 CDR  Thank you.

01 10 47 26 CC  Apollo 7, Houston. We're still looking on that dash 206 filter to determine which one it is.

01 10 47 31 CDR  Roger. It's showing red; it's not green. We're hoping it's 2A.

01 10 47 41 CC  Roger.

01 10 47 43 CDR  Clear coil filter. It's one of those last little things thrown at us before we launched.

01 10 49 33 CC  One minute to LOS. We're getting a lot of static on the ground down here. I was just wondering if you're getting it.
01 10 49 42 CDR Say again.
01 10 49 46 CC You are.
01 10 49 47 CDR Go ahead.
01 10 49 53 CDR Ron, would you say again?
01 10 49 55 CC Roger. We're receiving a lot of static on the ground. Are you receiving any at all?

01 10 50 00 CDR Negative.
01 10 50 04 CC Roger.

REDSTONE (REV 22)
01 11 01 31 CC Apollo 7, Houston.
01 11 02 07 CC Apollo - Apollo 7, Houston.
01 11 02 16 CDR This is Apollo 7. Do you read?
01 11 02 18 CC Roger. The dash 206 filter is the 2 Alfa filter, and it should be clear, hopefully.
01 11 02 28 CDR Say again.
01 11 02 29 CC Roger. The dash 206 filter is the 2 Alfa, 2A filter.
01 11 02 38 CDR Roger. Thank you. I have one question on potable water. We are scheduled to chlorinate at this time, and we have a completely full tank. Over.
01 11 02 53 CDR This tank has been full for some time, Ron. And it came up several months back, there is a question as to how much ullage volume you have to have in the top of that tank before you chlorinate. I'm kind of concerned about
the fact that the chlorination that we put in yesterday is probably still in that tank.

Roger. We understand your problem, and we'll get the word to you shortly here.

Okay.

CAM COMM, will you tell them that ...

We will wait till you get an answer.

Say again, Wally. Oh, I understand. We'll delay till we get an answer.

CAP COMM from Flight.

Apollo 7, Houston. We are reading .41 on the battery charger, and you can terminate charging battery A.

Understand. Stop charging, .41 amp.

Affirmative.

I am still reading .5 on board.

Houston, Apollo 7. Over.

Houston. Go.

Go ahead, Walt.

Roger. I show that we've probably been charging battery A now for about 7 hours. Is that consistent with putting the energy back that we took out during boost and both SPS burns?

Over.

Walt, took out 9.3, and looks like we put in about 4.5 hours.
01 12 02 13  CC  Apollo 7, Houston.
01 12 02 16  CDR  Roger. Go ahead, Houston.
01 12 02 17  CC  Roger. We'd like to send a P27 update request
accept, and I have a NAV check to give you.
01 12 02 41  CDR  Ready for NAV check.
01 12 02 45  CC  NAV check 036 15 4 balls plus 1875 plus 16885
1271. Read back.
01 12 03 11  CDR  Roger. Understand. 615 4 balls plus 1875 16885
1271. Over.
01 02 03 27  CC  Roger. I didn't get your readback on the hours.
036 hours 15 minutes.
01 12 03 38  CDR  Roger. It's just the three.
01 12 03 54  CC  Apollo 7, Houston. I've got some update for
you on the RCS calculated quantities and your
profile from battery status if you want to copy.
01 12 04 11  CDR  Roger. Did you read our readback on the NAV
check okay? Go with your info on the RCS
quantity and that update.
01 12 04 27  CC  Roger. This will be an update on figure 3
dash 1 on your RCS profile. At 36 hours, you
have 820 pounds.
01 12 04 52  CDR  Roger. Thirty-six hours, 820 pounds.
01 12 04 55  CC  And your RCS ground calculated quantities are,
in order, 56 percent, 63 percent, 47 percent,
63 percent.
Roger. I read 56, 63, 47, 63, and the total quantity again 8 ...

Roger. Your total quantity is 820 pounds.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

You read. Hey, Guam, do you read?

Apollo 7, Houston.

Apollo 7, go ahead.

Roger. Reading you weak. The computer is yours.

Thank you. ...

Say again, Walt.

Roger. At 36 hours into the flight, what number do I go on my chart?

Roger. You are going in 820 pounds, 820 pounds.

Eight hundred and twenty pounds, and I copied 634767 ...

All right. Roger. Say it again? 56634763?

Roger. Thank you.

And your battery status?

Say again.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 12 11 11</td>
<td>CC</td>
<td>Your battery status in ampere hours.</td>
</tr>
<tr>
<td>01 12 11 15</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>01 12 11 16</td>
<td>CC</td>
<td>Batt A 35.2, B 30.4, C 39.5. REDSTONE (REV 23)</td>
</tr>
<tr>
<td>01 12 37 02</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 12 37 05</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>01 12 37 06</td>
<td>CC</td>
<td>Roger. Did you copy battery status last pass? Stand by. Roger. I had 35.6, 30.4 I think it was, and 39 something, Ron. It looks to me like we didn't fill up battery A again, and is anybody giving consideration to do a second recharge of that battery some other time in the flight?</td>
</tr>
<tr>
<td>01 12 37 33</td>
<td>CC</td>
<td>Well, that is a possibility. We wanted to cut it off at the .4 limit though - just to - so we wouldn't get into overcharge type of problem we were talking about before launch. And we are working on it now, and we can't really come up with an answer at the present time. We'll work on it and let you know. And Walt, I have a Lima Sierra update for you.</td>
</tr>
<tr>
<td>01 12 39 14</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 12 39 21</td>
<td>CDR</td>
<td>Go ahead, Houston.</td>
</tr>
<tr>
<td>01 12 39 22</td>
<td>CC</td>
<td>Roger. I have a Lima Sierra update.</td>
</tr>
<tr>
<td>01 12 39 31</td>
<td>CDR</td>
<td>... very weak.</td>
</tr>
<tr>
<td>01 12 39 33</td>
<td>CC</td>
<td>Roger. Lima Sierra update.</td>
</tr>
<tr>
<td>Time</td>
<td>Call</td>
<td>Text</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>01 12 39 36</td>
<td>CDR</td>
<td>Stand by.</td>
</tr>
<tr>
<td>01 12 39 44</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>01 12 39 45</td>
<td>CC</td>
<td>Roger. Lima Sierra 074 slash 051.</td>
</tr>
<tr>
<td>01 12 39 55</td>
<td>CDR</td>
<td>Roger. 074 slash 051.</td>
</tr>
<tr>
<td>01 12 40 16</td>
<td>CC</td>
<td>7, Houston. One minute until LOS. Be advised Air Force 26, Navy 20.</td>
</tr>
<tr>
<td>01 12 40 28</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>01 12 40 32</td>
<td>CC</td>
<td>Sorry about that.</td>
</tr>
<tr>
<td>01 12 40 35</td>
<td>CDR</td>
<td>Welcome to the club.</td>
</tr>
<tr>
<td>01 12 59 11</td>
<td>CC</td>
<td>ASCENSION (REV 24) Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 12 59 50</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 13 00 47</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>01 13 00 53</td>
<td>IMP</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>01 13 00 55</td>
<td>CC</td>
<td>Roger. On the water chlorination: about 8 ounces of water, then chlorinate.</td>
</tr>
<tr>
<td>01 13 01 05</td>
<td>IMP</td>
<td>We got you clear for that one.</td>
</tr>
<tr>
<td>01 13 01 08</td>
<td>CC</td>
<td>Roger. I have a flight plan update. Ready to copy?</td>
</tr>
<tr>
<td>01 13 01 40</td>
<td>SC</td>
<td>... Go.</td>
</tr>
<tr>
<td>Time</td>
<td>Name</td>
<td>Message</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>---------</td>
</tr>
<tr>
<td>01 13 03 15</td>
<td>SC</td>
<td>Roger. Over.</td>
</tr>
<tr>
<td>01 13 04 12</td>
<td>CC</td>
<td>Apollo 7, Houston. S-band volume up at 37 plus 36.</td>
</tr>
<tr>
<td>01 13 04 20</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>01 13 05 24</td>
<td>CC</td>
<td>Apollo 7, CAP COMM.</td>
</tr>
<tr>
<td>01 13 05 29</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>01 13 05 31</td>
<td>CC</td>
<td>Hey, Wally, Deke here. We're not being recorded for a change. Just wanted to know how you felt about shuffling this sleep cycle around a little bit. Kind of looks to me at least - and speak up if you don't like the sound of it - but we have got a hell of a lot lost motion here when you might better be getting a little rest.</td>
</tr>
</tbody>
</table>
| 01 13 05 52 | CDR | We are getting kind of pooped, and I think that is why we started off the way we did today. ...
needed the sleep more than we did. |
| 01 13 06 08 | CC | You are very garbled. We're unable to read you. |
| 01 13 06 13 | CDR | Roger. Donn is sleeping now, and he needed the sleep more than we did. |
| 01 13 06 27 | CC | Roger. Understand that. I guess the question I am asking is whether you have got any allergy at all that all three to you knocking it off for a while. |
| 01 13 06 40 | CDR | Let's stick another day with it and ... |
Okay. We only have about 30 seconds left in this pass. Why don't you think about it, and Tom or Ron will talk to you about it again over Guaymas.

Roger.

MERCURY (REV 2½)

Hello, Apollo 7. This is Houston.

Apollo 7, Houston.

What do you say there, Tom?

Roger. Wally, real good rendezvous you pulled off today.

Yes, that's a little more traumatic than that other bird we used to fly.

Understand. We were talking down here, and we'd like to discuss free flight ... period of time about looking ahead in the flight plan, about the possibility of you all going all three crewmen on the sleep cycle. I just want to discuss it for down the line, what Deke was trying to say. What do you think about it?

I don't think I'd be afraid to do it on another flight, but we're kind of reluctant right now.

Okay.

The machine is working real well, Tom.

I was looking at all the block data about 40 hours and also waste water dump at 41, and
it's kind of quiet time after that for another 4 or 5 hours.

01 13 36 48 CDR Very good. This IVA is no problem at all. In fact, it is an asset.

01 13 36 55 CC Okay.

01 13 36 57 CDR All the problems we worried about the spacecraft picking up notions from the crew, no such thing. We can knock around the capsule like mad. You get to be quite a gymnast.

01 13 37 11 CC I want to ask you a question. How are the sleep bags working out?

01 13 37 15 CDR Not so hot.

01 13 37 17 CC Okay.

01 13 37 18 CDR You miss the 1 g lying down. With the seat belts resisting, you are held down, and you feel better controlled and better contained, I guess. Sleeping bag, you try to find a place to stick your head or your arm to hold on.

01 13 37 38 CC Our analysis is the couch is probably a little better than the sleep bag.

01 13 37 43 CDR That is correct.

01 13 37 44 CC Okay.

01 13 37 47 LMF We find the lightweight headsets are preferable to COMM carriers, too.

01 13 37 51 CC Right. Reviewed the flight plan here. Understand when you went to the lightweight headsets -
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 13 37 57</td>
<td>CDR</td>
<td>Yes. The cables for the COMM carrier is very objectionable and jabs you in the neck and the shoulder and keeps pulling your head around.</td>
</tr>
<tr>
<td>01 13 38 07</td>
<td>CC</td>
<td>All right.</td>
</tr>
<tr>
<td>01'13 38 11</td>
<td>CDR</td>
<td>We are not at all hungry by the way. We are trying to get some exercise to keep ourselves going. That Exer-Genie's a heck of a good deal.</td>
</tr>
<tr>
<td>01 13 38 22</td>
<td>CC</td>
<td>Works out real good in zero g?</td>
</tr>
<tr>
<td>01 13 38 26</td>
<td>CDR</td>
<td>Hate to admit that, but it is probably one of the best spacy things we have had in years.</td>
</tr>
<tr>
<td>01 13 38 31</td>
<td>CC</td>
<td>Okay. Okay. On the sleep thing, Wally, it is strictly your option, obviously. We just got to thinking maybe it will work out better, give you a little more, longer sessions of it.</td>
</tr>
<tr>
<td>01 13 39 18</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>01 13 39 20</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>01 13 39 23</td>
<td>CDR</td>
<td>We don't think we ought to SYNC Hasselblad here; we may be able to take one a little later.</td>
</tr>
<tr>
<td>01 13 39 30</td>
<td>CC</td>
<td>Roger. Understand about the camera.</td>
</tr>
<tr>
<td>01 13 39 35</td>
<td>LMP</td>
<td>Hey, Tom. I would like to log some photographs here on magazine Q, starting the same ... the same ... We started shooting about over the Red Sea, and we are continuing up to frame 12 right now.</td>
</tr>
<tr>
<td>01 13 39 50</td>
<td>CC</td>
<td>Okay. We were recording, and we have it, Walt. Thank you.</td>
</tr>
</tbody>
</table>
01 13 39 54  IMP  When are we going to get our tape recorders
back? I see it is in motion now. Will we ever
finish dumping all the tapes on the rendezvous
run?
01 13 40 03  CC  Not yet, Walt. We are still dumping.
01 13 40 07  IMP  Okay. We would like to get a GO as soon as we
get that through.
01 13 40 11  CC  Roger. We will let you know as soon as it is
finished.

GUAM (REV 24)

01 13 43 36  IMP  Houston, Apollo 7. Over.
01 13 43 39  CC  Go ahead, 7, Houston.
01 13 43 45  CDR  Houston, Apollo 7.
01 13 43 48  CC  Apollo 7, Houston. We go.
01 13 43 52  IMP  Houston, Apollo 7. Over.
01 13 44 08  CC  Roger.
01 13 44 25  CC  Apollo 7, this is Houston. Go ahead.
01 13 44 30  SC  Roger. Tom, do you know if they ever got the
voice dump right after ... the east end we put
our comments on about the tape, and I'm not sure
if they dumped ... 
01 13 44 45  CC  Apollo 7. We'll check on it.
01 13 44 51  IMP  Thanks, Tom.
01 13 46 08  CC  Apollo 7, Houston. Will you give us opposite
omni?
01 13 46 25  CC  Apollo 7, Houston. Will you give us opposite
I heard the boys in the back room talking. You got it now.

Roger. Apollo 7, Houston. It's taking quite a while to get all the voice data played back, Walt, and we won't really know for quite a while. Is there any particular GET on the voice you want us to check?

Roger. I know we rewound the tape at the Canaries, I think it was. I'm hoping we - right after boost, sometime there about 20 minutes, I think, we put out description of ... by the tape and someplace the first hour ...

Apollo 7, Houston.

Go ahead.

Roger. First made ... turns out from lift-off until Canaries, and because of rewind and everything, we do not have that on voice.

Okay. When we get the tape back, we'll probably try to put some on it.

Okay.

Apollo 7, Houston. We are about - we're close to LOS, and you gonna have the tape back. We've just about finished all the rendezvous dump.

Roger. Thank you. We've just finished chlorinating the water again.
REDSTONE (REV 24)

01 14 08 03 CC Apollo 7, this is Houston. We have acquisition at Redstone.

01 14 09 26 CC Apollo 7, Houston. Opposite omni, please.

01 14 10 32 CC Apollo 7, Houston. Would you give us the opposite omni now?

01 14 10 40 IMP Roger. That's back where we started. Is that where you want?

01 14 10 45 CC Yes. You switched about the same time we said to switch, so --

01 14 15 32 CC Apollo 7, Houston. Have 1 minute to LOS at Redstone.

01 14 15 37 SC Roger.

ASCENSION (REV 25)

01 14 34 28 CC Apollo 7, Houston through Ascension.

01 14 34 33 CDR ... standing by.

01 14 34 46 CC Roger. Read you about four-by, Wally.

01 14 34 56 CDR ...

01 14 35 01 CC Apollo 7, Houston. You are coming garbled. Say again.

01 14 35 33 CC Apollo 7, Houston. Say again, please.

01 14 36 02 CC Roger. Out.

01 14 36 19 CC Apollo 7, Houston.

01 14 36 22 CDR Go ahead.
Roger. Now reading you loud and clear, Wally. You happen to be in an attitude, and you have the camera available. There is a good area that we haven't had many pictures in. It's at 38 56 30, the upper end of the Persian Gulf down and to the right. If you have some time and camera, is fine; if not, no problem.

Roger. Say again the target.

Roger. The upper end of the Persian Gulf. It will occur in 38 56 30.

Okay.

Houston, Apollo 7. Do you read?

Go ahead.

Roger ... night air glow 240 degrees ... all almost all over the horizon as we sweep low.

Okay. You say all around the horizon, Wally?

That's right, on the night sky.

Roger.

... Sirius came up ...

Okay.

Hello, Apollo 7, Houston. Just looking at the sky. Are you pitched down about 90 degrees?

That is affirm. Camera all ready.
Roger. Well, we have about 1 minute until LOS
with Ascension, Wally, and we will catch you
next time over the Pacific.

Okay.

MERCURY (REV 25)

Apollo 7, Houston.

This is Apollo 7. How do you read?

Apollo 7, Houston.

Apollo 7. How do you read?

I am reading you about three-by-three. I had
a block data, but I will give it to you over
Guam in a few minutes - about 5 minutes.

That is a block data over Guam.

GUAM (REV 25)

Video strength in clear.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Roger. Houston, Apollo 7. Go.

Roger. I have block data. Are you ready to
copy?

Stand by one.

Houston, go ahead ... could you call and stand
Are you ready?

Okay. Go ahead. I got it now.

Roger. 027 dash 2 Bravo plus 206 minus 0253

041 26 13 4104, 028 dash 2 Bravo plus 277 minus
0288 043 02 05 4193, 029 dash 1 Bravo plus 240
minus 0633 044 27 52 4128, 030 dash 1 Alfa plus
297 minus 0662 046 03 34 4246, 031 dash 1 Bravo
plus 317 minus 0662 047 39 29 4430 032 dash
1 Alfa plus 291 minus 0662 049 15 09 4650.

Coming up on LOS.

Roger. Understand. I read back later then.

Roger. Thank you.

REDSTONE (REV 25)

Apollo 7, Houston.

Roger, Houston.

Roger. Apollo 7, Houston. Ready for your
readback on block data when you are ready.

Roger. Stand by. I am right in the middle of
a P52. Will be with you in a second.

Roger.

Sorry, Houston. I am ready with the readback.

Roger. Go.

Roger. Area 0272 Bravo plus 06 minus 0254 041 2613
4104, 28 dash 2 Bravo plus 277 minus 0298 043 02
05 4193, 029 dash 1 Bravo plus 240 minus 0633
Roger. Copy readback. Check one item on the third block: 029 dash 1 Bravo; second entry, plus 240.

Roger. Plus 240.

Roger. Readback is correct. And also 2A advisory: we had good voice quality on the Redstone dump that we got on the last pass.

All very good. I got a couple of small items for you. Wally took a couple of aspirin and an Actifed, and he only took one Actifed. Walt took one Actifed only. He feels fine. He has just got a little stuffy head cold, and I put some nose grease in mine because my nostrils are a little dry - because it smells good.

Roger. Understand. Wally took two aspirins and one Actifed, and Donn took one Actifed, and you took some nosedrops was it or cream?

Nose cream. It is a fluid they gave us in two tubes. Walt is the one that took the Actifed, not Donn.

Oh, okay, Donn. Sorry.

Yes. Log us about 16 clicks of water here in the last 45 minutes or so.
Okay. And that is Donn.

Right.

Okay.

You can tell them I had two good solid 7 hours of very good sleep and feeling great.

Roger. Thank you.

Apollo 7, Houston. We would like the BIOMED to number 1.

Understand. And I will do that after I - after I do this alignment. Does that mean you want to ... test counts?

Roger. We lost the downlink on the BIOMED, and this is just to see if it's actually the circuit or in the BIOMED harness.

Roger. I will do that in a couple of minutes.

Okay. Fine. We have about one and a half minutes to LOS.

You mean I get until next pass to secure this alignment.

Okay.

Apollo 7, Houston. Acquisition Canary.

Roger, Houston.

Okay.

Apollo 7, Houston. About 2 minutes LOS Canary.
Next acquisition will be Redstone at 41 plus 17.
That will be about 1 hour.

01 16 18 19 CC Apollo 7, this is Houston.
01 16 18 25 CMP Go ahead, Tom.
01 16 18 26 CC Roger. Donn, did you get P52 finished?
01 16 18 32 CMP Yes. I did it two or three times.
01 16 18 35 CC Roger.
01 16 18 36 CMP Turned out fine.
01 16 18 38 CC Good show.
01 16 19 14 CC Apollo 7, Houston. We have about 30 seconds
to LOS.
01 16 19 20 CMP Okay. LOS. ... take about one half hour ...
01 16 19 29 CC Okay.

REDSTONE (REV 26)

01 17 17 41 CC Apollo 7, Houston through the Redstone. Over.
01 17 17 45 CMP Roger, Houston. Go ahead.
01 17 17 48 CC Roger. Donn, reading you about three-by. I
want to check a couple of items. Have they per-
formed the waste water dump that was scheduled
for around 41 hours?
01 17 17 57 CMP Negative, Tom. We're going to wait until it
gets to about 90 percent. That way we won't
have to do it so often.
01 17 18 04 CC Okay. Spec-1, we're going to give you the MC -
we're going to send you an MCC update previously
scheduled for 44 40 at 44 hours.
Roger. Understand.

And we're planning the S-IVB tracking previously scheduled at 46 10. It will now be at 44 36. You should have a good update vectored on that, and the S-IVB will be at about 170 nautical miles.

Okay. Tom, how ... as soon as I get them, I'm going to write them down, and then you can give it to me a little later.

Roger.

Tom, are you still there?

Houston, Apollo 7.

Go. Apollo 7, Houston.

Roger. We've just completed the 23 sextant calibrations. I think that your data ... is down-range.

Apollo 7, Houston. We're about 1 minute to LOS, and you're starting to fade out. I understand you've completed the sextant calibration.

Roger.

Apollo 7, Houston. Did you experience a restart a couple of minutes ago?

I experienced a restart during part of program 52 that I was using to find some stars I needed, and I think it happened - it happened once before, the other day - when you go from zero
optics to CNC and also hit the feed and you haven't waited 15 seconds. It's a procedural error, and it's just a momentary restart, almost program alarm.

Okay.

Incidentally, I have an O₂ FLOW HI light. I suspect it's the same problem we had earlier - sensor failure. I haven't had time to trouble-shoot it for sure yet, though.

Okay. We'll pick you up - about 15 seconds to LOS, and we'll pick you up over the Canaries.

Apollo 7, Houston.

Apollo 7, Houston.

Houston, Apollo 7. Go.

Roger. In reference to the water dump: we're reading 70 percent now, predicting a 90-percent level at approximately 45 hours but no later than 46 hours. We'll have to dump at that time. It's right in the middle of a sleep period. Suggest dumping as soon as you can in order to prevent interrupting them in the middle of their sleep cycle.

Roger. I got you, Bill. They're already asleep, and the way we've got it rigged, it won't disturb either one of them. So I'd just as soon
wait till 45 hours.

Okay.

Good thinking. Bill, could you give me those flight plan updates that Tom called awhile ago? I was right in the middle of a G&N exercise and didn't get to write it down.

Okay. I'll start talking. I have about a minute and 15 seconds. Okay. At 44 hours, we will give you the MCC update previously scheduled for 44 plus 40.

Roger.

Okay. At 44 plus 36, perform S-IVB tracking. That was previously scheduled at 46 plus 10.

At that time - this new time - the S-IVB will be at 169 nautical miles. The last item, at 45 plus 30, delete P52 IMU realign.

CANDAR (REV 27)

Apollo 7, Houston.

Apollo 7, Houston.

Roger, Houston. Go ahead.

Roger. How far did you copy on the flight plan update.

Stand by ...
Roger. That completes the flight plan update. I have a couple of items. We're still monitoring an O$_2$ FLOW HI, check waste dump closed. Second item: we'd like BIOMED CMP. Okay. We're monitoring it now. Forget the BIOMED; it's okay.

Okay. Are you getting anything on me?

Yes, we are.

Okay. You're only getting half of it. One of those little plugs, I can't make up. I'll try again later to get it to plug in.

Okay.

I did have the waste vent open now, but I don't think that interferes with the O$_2$ FLOW HI.

Roger. Understand. It was open.

Roger. It was open for a little while there. It was stowage compartment. However, I've still got the O$_2$ FLOW HI, and I just turned the vent off.

Cabin pressure looks normal. I suspect it's still a sensor problem.

Okay. We're watching it. We have about 6 more minutes here.

Okay. Any help you can give me on that, I'd appreciate it.

Roger. We'll keep you informed.
Apollo 11, Houston. We have about 2 minutes to Los Canaries. Your O\textsubscript{2} manifold is dropping off. It's dropped from .96 to .74 in the last few minutes - O\textsubscript{2} flow.

Okay. O\textsubscript{2} flow.

Right.

Roger. I'm seeing the same thing. My onboard procedure leads me to believe it's still a failing sensor. Do you confirm that?

Bill, what do you have down there for O\textsubscript{2} tank pressure? Mine is reading low - about 840.

Okay. Stand by.

Correction. Number 2 is reading low. Number 1 is about 860.

Coming up on LOS, you have 876 and 853 in one and two, and 846 in the surge tank.

Okay. Is that all right with everybody down there?

I think so. Stand by.

I guess you would tell me if it was not.

Roger. That's good.

... everybody ...

We'll need the S-band volume up for our Honey-suckle pass at 42 plus 32.

Roger. I'll change it.

Thank you.
HONEYSUCKLE (REV 27)

01 18 33 06 CC Apollo 7, Houston.
01 18 33 22 CC Apollo 7, Houston.
01 18 33 46 CC Apollo 7, Houston.
01 18 34 08 CC Apollo 7, Houston.
01 18 34 30 CC Apollo 7, Houston.
01 18 35 06 CC Apollo 7, Houston.
01 18 35 30 CC Apollo 7, Houston.
01 18 36 58 CC Apollo 7, Houston.
01 18 36 41 CC Apollo 7, Houston.
01 18 37 24 CC Apollo 7, Houston.
01 18 38 01 CC Apollo 7, Houston.

REDSTONE (REV 27)

01 18 52 03 CC Apollo 7, Houston.
01 18 52 10 CMP Houston, Apollo 7. Go.
01 18 52 13 CC Roger. Reference the O₂ FLOW HI. Analysis here indicates your O₂ flow high. Indication on board was valid; at the time, you had 5.0 cabin pressure when the waste vent was open. Upon closing, the pressure gradually increased to 5.1.
01 18 52 54 CC Apollo 7, Houston. Do you still have an O₂ FLOW HI?
01 18 52 58 CMP Negative. Down to normal now.
01 18 53 01 CC Okay. One other item, the waste water dump.
Recommend dumping 85 percent instead of 90 percent. They're not sure it's safe to wait till 90 percent due to possibility of overboard drain freeze.

01 18 35 48 CC Apollo 7, Houston. Is the commander's and the IMP's cobra cable unconnected? Verify that it is not connected.

01 18 54 02 CMP Roger. They're not connected up here. They're off of it.

01 18 54 05 CC Thank you very much. Also I have a - disregard.

01 18 54 12 CMP Say again.

01 18 54 13 CC Disregard.

01 18 55 27 CMP Hey, Bill, would you log me 12 clicks from the water gun?

01 18 55 32 CC Roger, 12 clicks from the water gun.

01 18 59 50 CC Apollo 7, Houston. One minute LOS Redstone; Antigua at 43 plus 10.

01 18 59 59 CMP Roger. 43 plus 10. You got the night shift, eh?

01 19 00 55 CC Apollo 7, Houston. Coming up on LOS. I will have a flight plan update. Just a couple of items at Antigua.

ANTIGUA (REV 28)

01 19 11 14 CC Apollo 7, Houston.

01 19 11 17 CMP Apollo 7. Go ahead.
Roger. I have a couple of things for flight plan update.

Okay. Go ahead.

Roger. Fuel cell 0₂ purge at 45 plus 30. That's over Carnarvon.

Roger. Fuel cell 0₂ purge at 45 plus 30.

Roger. And just as a matter of information, have you checked any of the G&N control modes?

Roger. We've used - maneuvered manually and DAP half degree per second and our deadboard; we've done auto maneuvers, auto trim maneuvers, and some deadboard; and I also used the minimum impulse controller in the LEB.

Roger. Five degrees per second, minimum deadband, auto trim, minimum deadband, and a minimum impulse controller in the LEB.

Roger.

Thank you.

Houston, Apollo 7.

Apollo 7, Houston. Go.

Apollo 7, Houston. Go.

Houston, Apollo 7.

Roger. Apollo 7, Houston.

There is a high pitched interference noise coming over VHF. Have you got any idea what it is? Are you picking it up down there?
01 19 18 01 CC High pitched interference on VHF negative.
Stand by.
01 19 18 08 CC Donn, this is about the same place last night
where you picked up the music.
01 19 18 14 CMP There's some music along here, too.
01 19 18 31 CC Apollo 7, Houston. The NET is looking at it.
CANARY (REV 28)
01 19 24 04 CMP Houston, Apollo 7.
01 19 24 08 CC Apollo 7, Houston. Go.
01 19 24 11 CMP Roger. I've got a hydrogen purge scheduled
here at 44 hours. Do you want me to do that,
or are we doing that just on demand, so to
speak?
01 19 24 21 CC Negative. That one has been deleted.
01 19 24 24 CMP That's what I thought.
01 19 24 26 CC That's the hydrogen purge - fuel cell purge -
at 44 hours. That has been deleted.
01 19 24 32 CMP Roger.
01 19 25 11 CC Apollo 7, Houston. We will be giving you a
CSM and S-IVB state vector update over Carnarvon.
We will require ACCEPT when you get to Carnarvon,
and we're estimating AOS Carnarvon at 43 plus 57.
01 19 25 35 CMP Apollo 7. Understand.
01 19 26 43 CC Apollo 7, Houston. One minute till LOS at
Carnarvon. If you need contact, we have about
2 minutes S-band after that at Madrid.
01 19 28 56  CMP  ... Apollo 7. Understand. Thank you.

CARNARVON (REV 28)

01 19 57 55  CC  Apollo 7, Houston.
01 19 58 20  CC  Apollo 7, Houston.
01 19 58 49  CC  Apollo 7, Houston.
01 19 59 14  CC  Apollo 7, Houston.
01 19 59 34  CC  Apollo 7, Houston.
01 19 59 51  CC  Apollo 7, Houston.
01 20 00 10  SC  Houston, Apollo 7.
01 20 00 11  CC  Roger. Apollo 7, Houston. How do you read?
01 20 00 14  CMP  Loud and clear.
01 20 00 16  CC  Roger. If you'll go to ACCEPT, we'll send up
your state vectors.
01 20 00 20  CMP  Going to ACCEPT.
01 20 00 27  CC  And I have a NAV check when you are ready to
 copy.
01 20 00 32  CMP  Roger.
01 20 00 34  CC  NAV check reads: 044 03 0000 minus 2170 plus
 12234 1513.
01 20 01 09  SC  Roger. Could you send that one again?
01 20 01 12  CC  Roger. NAV check: 044 03 0000 minus 2170
 plus 12234 1513. Read back.
01 20 01 40  CMP  Roger. 44 3 0000 minus 2170 plus 12234 1513.
01 20 01 52  CC  Roger. Readback correct.
01 20 03 40  CC  Okay. Apollo 7, Houston. The computer is yours.
We have a little less than 2 minutes L/S
Carnarvon. Request S-band volume up in about 1 minute or 2 minutes.

CDR Roger.

REDSTONE (REV 28)

CC Apollo 7, Houston through the Redstone. Standing by.

CC Apollo 7, Houston. One minute LOS Redstone. Pick you up at the Bahamas in about 12 minutes.

CMF Roger. Jack, I read you a bit faint.

CC You're five-by, Donn.

MILAG through BERMUDA (REV 29)

CC Apollo 7, Houston. Standing by.

CMF Roger. Jack, I'm doing the P20 navigation right now.

CMF ... section.

CMF Houston, this is Apollo 7.

CC Go ahead, 7.

CMF Roger. The target's still visible in the sextant here. It's not as good as it was earlier. It's a different set angle because of the bright earth background. I see through the base line of sight, but it's still there, and you can still track it one more time.
Roger. I've been following your marks, Donn, and it looks like you are getting in VERBAL 649; it looks like you're getting real good marks.

Yes. We update this thing on the order of optics tracking rate within, I guess, a couple of minutes at the last of the ...

Roger.

Target's not in sight here; it was earlier, but it's —

Say again, Donn.

CANARY (REV 29)

Apollo 7, Houston through Canaries. Standing by.

Houston.

Roger. Go ahead, Donn.

...

I couldn't read that, Donn. You brought two-by.

I think the spacecraft ...

Donn, we can't quite make that out. We've got you here for about another 5 minutes, and maybe signal strength will get a little bit better.

Apollo 7, Houston. How do you read now?

Loud and clear, Jack.

Okay. Donn, you are a little better there on S-band.
Apollo 7, Houston. You are about 1 minute LOS Canaries. We'll pick you up over Carnarvon in about 28 minutes.

Roger.

Apollo 7, Houston through Carnarvon. Standing by.

Roger, Houston.

Houston, the lights are still flashing on the S-IVB.

Roger. Copy that.

And, Donn, as we go along here toward the end of our pass, which is about another 8 minutes, we'll pick up Honeysuckle. So you'll want to turn up your S-band.

Okay.

And we have Honeysuckle for about a 9 minute pass, so we'll have you for about another 16 minutes; and then you've got a long stretch without anything.

Okay.

Apollo 7, Houston. Go ahead.

..., Jack.

Okay. I'm sorry, Donn.
Apollo 7, Houston. You want to turn up your S-band volume? We're just about to lose you over Carnarvon.

Roger.

And, Donn, we want to make a radio check through this backup site at Honeysuckle, just to check it out.

Okay, Jack.

Honeysuckle (REV 29)

Apollo 7, Houston through the Wind Site. How do you read?

Apollo 7, Houston through the Wind Site. How do you read?

Weak, but clear, Jack. I'll turn the volume up.

Okay. You're loud and clear here.

Roger. Sounds pretty good.

Roger. This is a backup site there in Australia.

Understand. Jack, I've been looking at this horizon preparing for this midcourse navigation business; and at night, there just isn't any horizon that you can define in the sextant at all. There is one in the telescope, but I don't think that's accurate enough.

Okay.
The airglow band - or whatever it is - rides above. The real earth is so wide that there's no way to use it that I can see for navigation.

Okay. We copy that.

Donn, can you confirm whether you did the O_2 purge on the fuel cell?

Negative. I did not. I was working the LEB. I'll do that now.

Okay. Real fine.

Okay. Apollo 7, Houston. You've 1 minute LOS. The Wind Site will pick you up over Guaymas in about 24 minutes.

Roger, Jack.

Apollo 7, Houston. Standing by.

Roger, Houston.

Apollo 7, Houston.

Roger, Houston. Go.

Roger. Opposite omni, Donn, and we're reading now 87 percent on the waste quantity. We are recommending that you initiate the dumping of the waste tank.

Roger. Opposite omni and 87 percent waste water. We've got a good lock with this antenna.

Roger.
01 22 21 07  CMP  Jack, log me 12 click of water.
01 22 21 11  CC   Say again. Say again, Donn.
01 22 21 17  CMP  I said just record 12 clicks on the water
gun for me.
01 22 21 22  CC   Okay.
01 22 25 26  CC   Apollo 7, Houston.
01 22 25 29  LMP  Roger, Houston. Go.
01 22 25 31  CC   Roger. You have a GO for 47 dash 1.
01 22 25 35  LMP  Roger. GO for 47 dash 1 and log the LMP for
12 clicks on the water gun.
01 22 25 40  CC   Will do, and good morning.
01 22 25 43  LMP  Good morning.
01 22 27 07  LMP  Hey, Jack. So far this urine dump system has
been pretty doggoned good.
01 22 27 17  CC   Apollo 7, Houston. Go ahead.
01 22 27 20  LMP  Roger. I said the urine dump system has been
working beautifully so far.
01 22 27 25  CC   Okay. Fine. Walt, did you have the VHF off
just a minute ago?
01 22 27 34  LMP  Yes, I did. I just got up, and I hadn't turned
it on yet.
01 22 27 37  CC   Okay. Fine.
01 22 32 01  CC   CANARY (REV 30)
01 22 32 04  LMP  Apollo 7, Houston through Canary. Standing by.
01 22 32 04  LMP  Roger. Hey, Jack. We have yet to activate
the SPS line heaters.
Roger. Copy that. They look like they're holding real good.

And I'm wondering, what are we planning on doing with the preliminary water boiler?

Roger. Walt, we're having a meeting down here on that very subject. We'll come up to you with a procedure for activating that primary water boiler to take it out.

We have a flight plan update here. The landmark tracking that was planned for about 47 40 - the weather is very, very bad in those areas, and we are recommending that - we are asking you to delete that landmark tracking exercise.

Roger. I just did a little bit using clouds as unknown landmarks and ran through the program. Seems to work okay. I got zero updates.

Okay. Real fine, Donn.

Apollo 7, Houston. We are showing the waste quantity down below 20 percent now; it looks real good to us here.

Roger. We're shutting it off right now.

Okay.
01 22 38 29  CC  Apollo 7, Houston. You're 1 minute LOS Canaries. I'll pick you up in about 14 minutes at Tananarive.

01 22 38 38  CMP  Roger.

01 22 53 16  CC  Apollo 7, Houston through Tananarive. Standing by.

01 22 53 21  CMP  Roger.

01 22 57 48  CC  Apollo 7, Houston. One minute LOS Tananarive; Carnarvon in about 9 minutes.

01 22 57 48  CMP  Roger.

01 23 06 58  CC  Apollo 7, Houston through Carnarvon. Standing by.

01 23 07 03  IMP  Roger.

01 23 07 10  IMP  Jack, could you give us a map update?

01 23 07 12  CC  Will do. We're working on it.

01 23 08 00  CC  Apollo 7, Houston with your map update.

01 23 08 08  LMP  Roger. Go.

01 23 08 09  CC  REV 29: your GET is a node of 46 plus 06 plus 31; longitude will be 129.2 degrees west; the right ascension was 06 plus 02.

01 23 08 32  IMP  Roger. 46 plus 06 plus 31, 129.2 west.

01 23 08 38  CC  Roger. That was for REV 29. You are on 30 now.

01 23 08 48  IMP  Thank you.
01 23 08 54  LMP  What's the news this morning?
01 23 08 58  CC  Give you some scores if you would like.
01 23 09 02  LMP  Go.
01 23 09 05  CC  Any particular ones you're interested in?
01 23 09 09  LMP  USC, UCLA.
01 23 09 47  CC  Okay. Walt, Penn State beat UCLA 21 to 6.
01 23 09 57  LMP  Boo.
01 23 10 03  CC  And USC beat Stanford 27 to 24. Oklahoma beat Houston 21 to 17.
01 23 10 14  LMP  That's a surprise.
01 23 10 19  CC  And here is a good one. Ohio State beat Purdue 13 to 0.
01 23 10 25  LMP  Who beat Purdue?
01 23 10 27  CC  Ohio State.
01 23 10 31  LMP  Eat 'em up, Buckeyes.
01 23 11 38  CC  Apollo 7, Houston.
01 23 11 40  LMP  Roger, Houston.
01 23 11 42  CC  Roger. Big news in the paper today was Apollo meets with second stage.
01 23 11 49  LMP  What was that?
01 23 11 50  CC  That was the big news. Apollo meets with second stage, front page stuff.
01 23 11 59  LMP  Almost makes it worth it. I tell you, you had three of us sweating up here.
01 23 14 04  CC  Apollo 7, Houston. Do you want to turn up your S-band? We are about 1 minute LOS Carnarvon.
We will pick you up over Honesysuckle and -
almost instantaneous here.

Wilco.

And, Apollo 7, just continuing with the morn-
ing news - basically, the headlines this
morning are all about the rendezvous. They
had another heart transplant in Houston early
this morning. It is going well at last report.

HONEYSuckle (REV 30)

Thank you.

Have you got the Air Force-Navy score? Air
Force over Navy 26 to 20, Southern Cal over
Stanford, Ohio State over Purdue, Texas 26
Oklahoma 20, Notre Dame beating Northwestern
27 to 7.

Apollo 7, Houston. I have some flight plan
updates here for you when you are ready to
copy.

Roger. Wait one. The last score we got was
27 to 7. Ready to copy in a second.

Okay.

Ready to copy. Go.

Okay. At this G&H attitudes control test over
Hawaii, we want to make sure that we have the
high bit rate before we start it, and we acquire
Hawaii at 49 08 45. It's a little bit
different than it is in the flight plan; we just wanted to make sure we had the high bit rate before we started it. And the same way with the attitude control test which is at 50 40. On REV 33, the P52 IMU realign at 51 30, we would like you to -

A little slower, please, Jack.

Okay. The IMU realign at 51 30, we would like you to use option 3 instead of option 2. We would like to keep the current REFSM4AT, and also we would like you to report your gyro torquing angles at the conclusion of this realignment.

Roger. Got you.

Okay. The - at 52 hours to P20 navigation, sunrise will be at 52 06. This might be useful for your S-IVB tracking at 320 miles.

Roger. 52 06.

And that's it right now.

Okay. I have a question here on the attitude control test. You've got high bit required 20 to 30 minutes on the G&N attitude control test. Very shortly thereafter, you have 10 to 20 minutes of G&N attitude control test. How are we going to get all that.
and are they going to get all that dumped so we can have our tape back?

Okay. Stand by here. I'll get EECOM on that.

Can't you get a lot of that in real time, rather than in tapes?

Yes, we can. Stand by, Walt.

Apollo 7, say again.

We didn't call.

HUNTSVILLE (REV 30)

Apollo 7, Houston through the Huntsville.

Two-way lock. Out of range.

Apollo 7, Houston through the Huntsville.

Standing by.

GUAYMAS through BERMUDA (REV 30)

Apollo 7, Houston through Guaymas.

Roger, Jack.

Roger. Donn, we'd like to get some continuing remarks on your habitability there: how things are going, your living conditions, sleep and crew condition, and things like that. And by the way, Walt, we would like to ask you how you are feeling this morning and if that one Actifed that you took helped out.

Roger. I took one Actifed; my nose was slightly stuffy last night, but it didn't give me any
problem while sleeping. I feel fine this
morning. I feel in good shape.
Okay. Real good news.

... If you feel like you want to take any more,
let us know, okay?
Roger. All of us are somewhat concerned. We
all drinking out of the same water system and
everything, and we all have one cold. But
Wally seems to be getting a lot better, too.
Okay. That's real fine news.
In general, it's been going real well up here.
It's reasonably comfortable: air temperature
is fine, the humidity is fine. We're just
perking along; and with a little extra time,
everybody is in pretty good shape. Little
exercise now and then so everybody is in good
shape.
Okay. That's fine.
I got 7 solid hours of sleep last night; and
Walt just had about six, and he's up and
Wally's still asleep.
Okay. That's fine.
As far as humidity goes, I'd say it's rela-
tively comfortable in here. Several things –
small things we've noticed along the way, but
most of the things we've worked out ahead of time, it looks like.

Okay. Copy.

GUAYMAS through BERMUDA (REV 31)

I feel very strongly on the sleeping bit. The sleeping bag is not as good to have the shoulder harness and lap belt to strap you down against something, and I think we all feel kinda that way.

Okay. Copy that.

Other than that, I think it is rather amazing how well and quickly we all been able to adjust to IVA.

Okay.

You might note that - from my personal observation at least - that there's far too much sweet in the diet, and I feel like we have more food than we need. I think Wally feels the same way. Donn seems to be eating most of his, though.

I would suspect that in another couple of days I'm probably just going to skip a whole meal in order to keep up with him.

Okay. Copy.

Another comment is that the exerciser is very, very good thing to make you feel better up here. I find that after we're up here - about
the middle of the first day - we started noticing that your lower abdominal muscles seem to be a little sore. Always floating around in this seated position, and there is certainly enough strain taken off them, and now they kinda want to bunch up, and if we exercise once in awhile, we feel a lot better.

That's a good note.

Did you read that, Houston?

Roger. Copy that. That's real fine news.

And Walt, sometime - Walt and Donn, sometime after Wally gets awake and the three of you have a real good chance, we'd like to get a good status check on your windows.

Roger. I can give you that now if you'd like.

Okay. Let's do.

Okay. Window number 5 is still - I'd say - in very good shape. Nothing compared to the pictures I've seen of a bad window in Gemini.

Window number 4 is still in good shape - I mean, no concern about taking pictures out of it at all. Window number 3 has been continually deteriorating since about the first day, and you can see moisture collected on the inside of the outer pane and kinda spotty in the middle. You can see horizons out of it, but not a heck
of a lot more. Window number 2 is still in good shape. On the left front side of it, you can see a slight amount of discoloration that may eventually work its way in on it. And window number 1 is similar to window number 5 except that it seems to have a lot of these little snow flakes settling on it. Window number 1 is right close to the urine dump and probably is coming from there.

Okay. Copy that.

Okay. We'll have you all the way across the States; we'll just keep standing by.

Okay. You might make note that I haven't had any problems with food bags yet. Several comments though: that pill is supposed to be broken up, and you're doing well when you get the pill inside the bag. I don't know anybody who's got fingers strong enough to break it. Also, the gum doesn't have any Velcro on it whenever it shows up, and it's turning out that it's pretty significant that everything have a patch of Velcro on it.

Okay. We copy that.

Also, the wet wipe that's packed with the fecal bags, they do not have Velcro on it, and they need it.
The temperature inside the cabin has been very comfortable. Wally and Donn put on their in-flight coveralls. They got out of the suit.

I've been in my GWG ever since, and I guess when we start with the show business, I'll have to get dressed for it.

Okay. Copy that.

Apollo 7, Houston.

Roger, Houston. Go.

On the G&M control check that you were asking about - over Hawaii - that will be done over the states in high bit rate and real time. It won't require any DSE operation other than normal.

Roger. We will stand by for your verification that you have high bit rate before we start it.

Okay. That's real fine.
CANARY (REV 31)

Houston, Apollo 7.

Go ahead, 7.

Roger. I just did that daylight alignment, and we're told to pick a pair, and I picked out Ras-Alhague and Nunki. Ras-Alhague came in clear enough to mark on, but Nunki was a total loss because it's too close to the earth's limb.

Okay. Understand you got a daylight alignment.

Roger. Well, I didn't complete it. I got as far as having to pick a pair of big looking stars, but you will never be able to find them yourself. But I saw this Ras-Alhague when I picked out something in the sextant and marked on it. I assume it was Ras-Alhague because that's what we were going for. But the point is, daylight alignments aren't going to work too well unless you get far enough away from limb of earth and other bodies.

Okay. Copy that, Donn.

And I think that doing a PS1 under these conditions would be a dead loss.

Roger. Copy.

Apollo 7, Houston. One minute LOS Canary.

Tanarrive in about 12 minutes.

Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 00 25 58</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive.</td>
</tr>
<tr>
<td>02 00 26 02</td>
<td>SC</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 00 29 21</td>
<td>CMP</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>02 00 29 24</td>
<td>CC</td>
<td>Go ahead, 7.</td>
</tr>
<tr>
<td>02 00 29 26</td>
<td>CMP</td>
<td>Roger. We've got a lockup in the comp cycle of program 21. Could you get a G&amp;N bearing on us, or give us a handy dandy on what to do to correct that to get out of it?</td>
</tr>
<tr>
<td>02 00 29 43</td>
<td>CC</td>
<td>Okay. I understand that you are locked up into program 21?</td>
</tr>
<tr>
<td>02 00 29 50</td>
<td>CC</td>
<td>Is that correct?</td>
</tr>
<tr>
<td>02 00 29 51</td>
<td>CMP</td>
<td>In that time interim, we hit the PROCEED button, and the COMP light has been on ever since.</td>
</tr>
<tr>
<td>02 00 30 07</td>
<td>CC</td>
<td>Okay. Stand by, 7. We're getting somebody to help us out here.</td>
</tr>
<tr>
<td>02 00 30 12</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 00 31 00</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>02 00 31 04</td>
<td>CMP</td>
<td>Go.</td>
</tr>
<tr>
<td>02 00 31 06</td>
<td>CC</td>
<td>Donn, can you tell us at what display you had in the program when you hit the PROCEED?</td>
</tr>
<tr>
<td>02 00 31 15</td>
<td>CMP</td>
<td>We had the time ... went into normal ground track, and it usually only takes about a minute to calculate the position.</td>
</tr>
<tr>
<td>02 00 31 28</td>
<td>CC</td>
<td>Could you say again? We missed the display.</td>
</tr>
</tbody>
</table>
Apollo 7, Houston. I understand you had the time in there, and it was going to integrate ahead to figure out where you were, and that is the procedure you are talking about?

That's right.

Roger.

What time did you put in there, Apollo 7?

Apollo 7, we're going to have continuous coverage here through ARIA 1 until we reach Carnarvon.

ARIA 1 (REV 31)

Apollo 7, Houston through ARIA 1.

Apollo 7, Houston through ARIA 1.

Apollo 7, Houston through ARIA 1.

'Is is Apollo 7.

Apollo 7, Houston.

Apollo 7, Houston. We're reading you five-by.

CARNARVON (REV 31)

Apollo 7, Houston through Carnarvon.

Roger. Hear you, CAP COMM Houston.

Roger. Real fine. Did you come out okay on P21, Donn?

Yes, it finally quit integrating. I'd already asked it to go to POO, so it went straight to POO.

Okay. Real fine. I've got some discussion on the primary evaporator to take up with Walt here.
He's listening. He's writing.

Okay. There will be some procedures, so you might want to copy this down. What we would like to do is to determine the status of the primary water boiler, and then we – therefore, we intend to activate the primary evaporator over the stateside pass this revolution. So when bringing the evaporator on, Walt, we want you to open the back pressure valve manually for 2 seconds, since we're not sure how much water is in the evaporator, and this would minimize any possibility of carrying excess water through the steam duct and possibly freezing it. Then on the ground cue over the States, we would like you to first put the glycol evaporator \( \text{H}_2\text{O} \) flow switch to AUTO. Second, put the glycol evaporator steam pressure to MANUAL. Third, go DECREASE for 2 seconds. Observe the temperature decay on the primary evaporator outlet. If you don't get any decay, we want to go DECREASE for 2 seconds more. If you get a temperature decrease, then wait 30 seconds; place the evaporator steam pressure to AUTO. We'll watch it all from the ground, but if you observe any anomalies in your out-of-ground conta, we would like you to troubleshoot per
the malfunction procedures recorded on high bit rate on DSE and report it to the next site.

And if you want any of this repeated, I'll go over it with you - a little slower.

I could write about half that fast, and I only got the first three steps, Jack. Back pressure open for 2 seconds; do you want me to do that prior to getting into the States?

No, we will do this when we hit the States, so we can watch it here. We will tell you when we've got good data; and then when you bring it on, open it for 2 seconds. This will all be on ground cue. And then - I'll read these steps again, a little slower, Walt. First step, H₂O flow to AUTO; second, steam pressure to MANUAL; third, decrease steam pressure switch to DECREASE for an additional 2 seconds. Observe for a temperature decay on the EVAP OUT temperature. Okay. If you don't get any temperature decay, decrease the steam pressure for 2 additional seconds. Then, if you get a temperature decrease on the EVAP OUT temperature, wait 30 seconds; then place the glycol EVAP OUT steam pressure to AUTO. Okay. If you get any anomalies and you're out of ground contact, troubleshoot it per the malfunction
procedures, recording it on high bit rate, and we’ll pick you up at the next site.


Okay. After temp decrease is observed, wait 30 seconds; then place the steam pressure switch to AUTO.

I have here decrease something for 2 additional seconds.

Okay. Let me go over it again.

Two seconds.

Okay. You go to MANUAL, decrease the steam pressure for 2 seconds; that’s step 3. If you don’t get any temperature decay, decrease - third, decrease steam pressure switch to DECREASE for an additional 2 seconds. That’s step 4.

Roger. I understand that if I don’t get any pressure decrease - temperature decrease in how long a time period?

About 30 seconds - give it 30 seconds, Walt, to note any temperature change.

Roger. The back pressure open for 2 seconds on your cue; water flow to AUTO on cue. Steam pressure to MANUAL, decrease steam pressure
for 2 seconds. Watch the glycol EVAP OUT temp decrease; if no temp decrease in 30 seconds, then I - decrease steam pressure for another 2 seconds. If I get a decrease, I wait 30 seconds and then go to AUTO. Any anomalies, I troubleshoot.

That's good; you got it. Okay, Apollo 7. You might want to turn your S-band volume up; we're about to pick up Honeysuckle here.

Roger, Jack.

We'll just be standing by here. We don't have anything special for you.

Okay. You might find out what rate they want set up for this G&H attitude control test.

I didn't copy that, Donn. You were a little garbled.

I said, the G&H test: what rate do you want put in?

Okay. Stand by.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston through Honeysuckle.

Roger, Jack.
Okay. You're five-by. On Donn's question, was that weight W-E-I-G-H-T or rate R-A-T-E?


Okay. Okay. Stand by.

Apollo 7, Houston.

Roger. Go, Houston.

Okay. Donn, what we would like to have is a spacecraft maneuver rate, at somewhere - rate 1 degree per second or greater. In the DAP, we would like you to set 4 degrees per second in the rate.

Apollo 7, Houston.

Apollo 7, Houston through Hawaii.

Apollo 7, Houston.

Apollo 7, Houston with an update.

Apollo 7, do you read? Houston.

Roger.

Okay. Donn, we have an update on DAP rate deadband we'd like you to set in; we would like you to set in two-tenths of a degree per second for the rate deadband for this G&N attitude control test.

Okay. I got that in.

Okay. Real fine.

Jack?
Go ahead.

I'm not going to do that 1 degree per second because it wastes too much fuel. What I will do is just go ahead and put it in G&N attitude hold at deadband for two-tenths rate and then let it sit around here for as long as you want to look at it.

Okay. You want to - we copy that. We'll give you - we haven't picked up high bit rate here; we'll give you a hack as soon as we have high bit rate.

Okay. I'm ready to copy your log data.

Roger. I'll give you that. Opposite omni first.

Apollo 7, Houston. We have high bit rate; you can start the G&N attitude control test; and, Walt, I will give you the block data.

Roger. This is ... now.

Okay. Block data for block number 6 as follows:

033 dash 4c plus 314 minus 1450 52 plus 05 plus 09 4335, 34 dash 3c plus 200 plus 1500 53 plus 21 plus 42 4119, 035 dash 3b plus 250 plus 1390 054 plus 55 plus 07 4143, 036 dash 4a plus 250 minus 1659 056 plus 46 plus 40 4785, 037 dash 3a plus 315 plus 1390 058 plus 07 plus 17 4439, 30-38 dash 3a plus 263 plus 1374 059 plus 42 plus 35 4645.
Roger. Readback follows: 033 dash 4 Charlie plus 314 minus 1450 052 05 09 4335, 34 dash 3 Bravo plus 200 plus 1500 053 plus 21 plus 42 4119, 035 ... plus 315 plus 1390 058 plus 07 plus 17 4439, 38 dash 3 Able plus 283 plus 1374 059 plus 42 plus 35 and 4645. Over.

Roger. Walt, we had a transition from Hawaii to Huntsville, and I lost a little bit of it here. The second block was 034 dash 3 Charlie instead of 3 Bravo. And I lost you right after 035 dash 3 Bravo. Could you give me that down to the beginning of 037 dash 3 Able?

Roger. I'll pick up. 035 dash 3 Bravo - I got your correction - 034 dash 3 Charlie and 035 dash 3 Bravo plus 250 plus 1390 054 plus 59 plus 07 4143, 036 dash 4 Able plus 250 minus 1659 056 plus 46 plus 40 4785. Over.

Roger. That's got it. We copied five-by.

Apollo 7, Houston.

Go ahead, Houston, Apollo 7.

Roger. On this primary evaporator activation: we are going to wait until we get a RAD OUT temperature above 50 before we start it.

Roger. Do you have any idea about what time you want to do that? It doesn't get above 50 until after we have been in a daylight pass most of the pass.
Roger. We are just discussing that now. It looks like the way it's coming up, it's going to be a little bit.

Roger. It hasn't been coming up. You are talking about the evaporator outlet temperature, I assume; it hasn't been coming above 50, until ... to the last part of the daylight pass.

No, we were talking about the RAD OUT temperature, Walt, just so we can make sure that the boiler is going to really work.

Okay. I'm showing a RAD OUT temperature now of just about 50.

Okay. Stand by here.

We are only showing a RAD OUT of 42 degrees, and we are going to check CAL curve right now.

Roger. I am reading 49, about on border; ... 3 point scale. Let's say 45 to 50.

Okay.

Apollo 7, Houston.

Go, Houston.

Okay. Donn, on that RAD OUT, when - we are reading 43 now, and there is a big spread between your value and ours, and ours is correct according to the CAL curve, so it will be a little bit yet before we get to activation of the evaporator.
HAWAII through ANTIGUA (REV 32)

02 01 25 27 CMP Okay.
02 01 26 24 CMP Houston, Apollo 7.
02 01 28 26 CC Go ahead, 7.
02 01 28 27 CMP Are you on VHF now?
02 01 28 32 CC Affirmative. We are receiving VHF; we are SIMO on transmit.
02 01 28 38 CMP Okay. Fine. There for a while, it seemed you were only on S-band.
02 01 28 50 CC Apollo 7, can you tell us what direction you are pointed at relative to the sun?
02 01 28 58 CMP What direction - what? Say again, Jack. Why don't you read our gimbal angles and figure it out? You can probably do it better than we can.
02 01 29 10 CC Roger.
02 01 29 12 CMP It's coming in the left side window; it's a little bit forward of us.
02 01 29 17 CC Okay.
02 01 36 10 CC Apollo 7, Houston.
02 01 36 21 CC Apollo 7, Houston.
02 01 36 37 CC Apollo 7, Houston.
02 01 36 57 CC Apollo 7, Houston. We are going to delay activation of the primary evaporator until Ascension. We will contact you at Ascension in approximately 8 minutes.
02 01 37 51 CC  Apollo 7, Houston. Thirty seconds LOS Antigua.

ASCENSION (REV 32)

02 01 47 09 CC  Apollo 7, Houston through Ascension.

02 01 47 47 CC  Apollo 7, Houston through Ascension.

02 01 47 55 IMP Roger. This is Apollo 7. We're standing by for your evaporator procedure. I can --

02 01 48 00 CC  Okay. Walt, we're going to wait until we get high bit rate here. We've got a keyhole effect which is going to delay our high bit rate for a minute or so, and then we'll be ready to start.

02 01 48 11 IMP Roger.

02 01 49 03 CC  Apollo 7, Houston. We're ready to start on the primary evaporator test. You can open the back pressure valve manually for 2 seconds.

02 01 49 12 IMP Are you ready to receive this procedure?

02 01 49 20 CC  Okay. You want to put your water valve to AUTO?

02 01 49 26 IMP You want me to decrease for 2 seconds first, don't you?

02 01 49 35 CC  Okay. Walt, we want to go AUTO first on the water valve.

02 01 50 07 LMP Jack, on S-band.

02 01 50 11 CC  Okay. Walt, read you five-by. You want to --

02 01 50 16 IMP The steam pressure came down to .15, and glycol evaporator outlet temperature is coming down.
Okay. Understand.

I am going to go AUTO on the steam pressure because the glycol evaporator outlet temperature is down.

Okay. We'd like you to hold it for 15 seconds.

Do what?

Hold off on putting the steam pressure valve to AUTO for 15 seconds here.

Roger. I had it in there; I just took it back.

Okay.

Okay. Apollo 7, you can put the steam pressure valve to AUTO now.

Roger. It's in AUTO. The glycol evaporator outlet TEMP is reading 38 on board.

Roger. We copy.

Apollo 7, Houston. We are about 1 minute LOS; we would like you to continue this procedure; watch the glycol EVAP OUT temperature. If you get any anomalies, then record it on the high bit rate; we'll pick you up over Tananarive.

Roger. What time for Canaries?

Tananarive will be - 50 hours, 1 minute.

Okay.

TANANARIVE (REV 32)

Apollo 7, Houston through Tananarive.

Roger, Jack. And the water boiler seems to be operating normally now.
Okay. Real fine.

It evaporated normally after we ...

I think he said it evaporated normally since he left Ascension. I wonder if he is evaporating now.

Apollo 7, Houston. One minute LOS Tananarive; we pick up ARIA 1 in about 3 minutes. We'll have continuous coverage through Carnarvon.

Apollo 7, Roger.

This is Apollo 7.

Go ahead, 7.

ARIA 1 (REV 32)

ARIA 1, go REMOTES.

Apollo 7, Houston through ARIA 1.

ARIA 1 AOS.

Apollo 7, Houston through ARIA 1.

Apollo 7, Houston through ARIA 1.

CARNARVON (REV 32)

Apollo 7, Houston through Carnarvon.

Roger, Houston.

Apollo 7, Houston. We have a CSM and S-IVB state vector update we'd like to send you. Would you go to ACCEPT?

You have it.

Coming up.

Houston, Apollo 7.
Go ahead.

In the flight plan, we have AOS Hawaii at about 5 plus 45.

Roger.

Control test.

Roger.

It took us 20 minutes. We performed that during the tracking exercise for the rendezvous. I'd like to hold off that type of FPO until after we have our third burn.

Okay. Stand by.

Roger.

Apollo 7, Houston. We concur on delaying the attitude control test until after burn 3.

Roger. I think we met the requirement, Jack, but if we can check the data from the previous revs, we might not have to do that one.

All right. Let's do that. We'll check it.

Apollo 7, Houston.

Go ahead, Jack.

We're trying to get an inertial attitude hold angle that we would like you to go to to further evaluate this primary evaporator, and we'll try to get you these angles early so you can take your time maneuvering there. What we want to do is heat up these radiators as much as
possible, and it won’t have to be a tight attitude hold at all, just want to get as maximum a beat on the radiator as we can to give us a lot of confidence in that primary evaporator.

Roger. What time spread are you talking about?

Next stateside pass.

Wilco.

Apollo 7, Houston.

Go ahead.

Roger. We have roll, pitch, and yaw gimbal angles for this evaporator evaluation.

Go.

Okay. Roll 218, pitch 129, yaw 18.

Jack, is that 18 degrees?

Roger. 018, excuse me. Yaw is 018.

You can maneuver there as slowly as possible and set up the MAX deadband, and we’ll evaluate this over the States.

Okay. What time would you like this new attitude?

For the day pass, Wally, over the States.

Okay. It’ll be ... approximately 50 hours and 45 minutes.

Okay. Real fine.

I’ll read back: 218 roll, 129 pitch, and yaw.

That’s 218 roll, 129 pitch, 018 yaw.
02 02 23 16  CDR  I have that.
02 02 23 18  CC  Okay.
02 02 23 24  CC  And, 7, we have finished with the loads; we
                 have verified them.  The computer is yours.
02 02 23 33  CDR  Roger.
02 02 23 38  CDR  Jack, do you have a NAV update for us?
02 02 23 42  CC  Say again.
02 02 23 44  CDR  Do you have a NAV update for us after that
                 state vector load?
02 02 23 50  CC  Roger.  That was CSM and S-IVB state vector.
02 02 23 55  CDR  Roger.  Don't we do the NAV update to validate?
02 02 23 48  CC  Okay.  Stand by.
02 02 24 11  CC  I have your NAV check; are you ready to copy?
02 02 24 19  CDR  Stand by.  Okay.  Go.
02 02 24 22  CC  Okay.  Sextant track time 051 plus 35 plus 0000
                 minus 2779 plus 02505 1549.
02 02 24 49  CDR  Roger.  051 35 0000 minus 2779 plus 02505 1549.
                 Over.
02 02 24 59  CC  Roger.
02 02 25 06  CDR  Did you read that, Jack?
02 02 25 08  CC  That's a correct readback; that's 15 1/4.9.
02 02 25 14  CDR  15 1/4.9.  Roger.  And copy ...
02 02 25 19  CC  Okay.
02 02 25 22  CMP  Okay.  It looks like we're right on, doesn't it?
02 02 25 27  CDR  That's speedy work up here, Donn.
02 02 25 33  CC  Stand by.
02 02 25 35  CDR  ... the DSKY.  You've got an update.
HAWAII through ANTIGUA (REV 32);

02 02 43 13 CC  Apollo 7, Houston through Hawaii.
02 02 43 18 CDR  Roger, Houston. We're drifting in attitude now.
02 02 43 21 CC  Roger. Real fine. Wally, when we hit the
States, we'd like to switch over to a deadband
as long as we are holding attitude for this
radiator - or evaporator evaluation. We'd like
to switch over to a deadband, and we'll kill
that DTO, that G&N attitude control test at the
same time. I will give you a call over Cali-
ifornis when we would like to set in the rate.

02 02 43 54 CC  And it —
02 02 43 55 CDR  The deadband is expensive; it's about 5 pounds
an hour, and we've done that during the rendez-
vous maneuver.

02 02 44 04 CC  Roger. We understand that. This will only be
for a minimum of 10 minutes.
02 02 44 09 CDR  Bill, that's about 1 pound.
02 02 44 11 CC  I mean —
02 02 44 12 CMP  Prior to the SPS burns about 5 to 10 minutes
each. - We're saying that SPS will be depleted.

02 02 44 32 CDR  And by the way, Houston, Hawaii is part of the
United States now.
02 02 44 38 CC  Roger. I understand, Wally.
02 02 44 40 CDR  You are showing your age, Jack.
02 02 47 27 CDR  Houston, Houston, Apollo 7.
02 02 47 31 CC  Go ahead, 7.
<table>
<thead>
<tr>
<th>Time</th>
<th>Entity</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 02 47 33</td>
<td>CDR</td>
<td>Roger. There is something we have never made note of before. It happened during spacecraft tests and does here as well. When the twelfth maneuver is put in, the gimbal drive reflects that maneuver - even though the clutch current is OFF - plus or minus about half a degree.</td>
</tr>
<tr>
<td>02 02 47 53</td>
<td>CC</td>
<td>Roger. I understand.</td>
</tr>
<tr>
<td>02 02 47 55</td>
<td>CDR</td>
<td>It's just an anomaly; might surprise subsequent crews.</td>
</tr>
<tr>
<td>02 02 48 00</td>
<td>CC</td>
<td>Okay. We copy.</td>
</tr>
<tr>
<td>02 02 48 01</td>
<td>CDR</td>
<td>No problem.</td>
</tr>
<tr>
<td>02 02 48 29</td>
<td>CDR</td>
<td>Houston, the reason we are resisting burning up fuel is that we're not really - We just had a good view of a contrail en route to Hawaii.</td>
</tr>
<tr>
<td>02 02 49 08</td>
<td>CDR</td>
<td>We're right on the border line on fuel as far as making our line good.</td>
</tr>
<tr>
<td>02 02 49 12</td>
<td>CC</td>
<td>Roger. Opposite omni, 7.</td>
</tr>
<tr>
<td>02 02 49 15</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 02 49 17</td>
<td>CC</td>
<td>Wally, we are having some more discussion on that MIN rate over the States here. We'll let you know.</td>
</tr>
<tr>
<td>02 02 49 26</td>
<td>CDR</td>
<td>We're doing the next steps later.</td>
</tr>
<tr>
<td>02 02 49 31</td>
<td>CC</td>
<td>Roger. We understand.</td>
</tr>
<tr>
<td>02 02 49 34</td>
<td>CDR</td>
<td>Huntsville ... two wheel log, valid range.</td>
</tr>
<tr>
<td>02 02 51 00</td>
<td>CT</td>
<td>Apollo 7, Houston.</td>
</tr>
</tbody>
</table>
02 02 57 09 CDR Go ahead.
02 02 57 11 CC Roger. We'd still like you to go ahead and set in that MIN rate, complete this G&N attitude control test. This will be the minimum cost fuel-wise right now.
02 02 57 22 CDR Roger ... 
02 02 57 26 CC Roger. We understand.
02 02 57 28 SC Okay. I don't think you people understand real well. We are still testing.
02 02 57 37 CC Roger. Understand.
02 02 57 50 CDR All ... be prepared to debrief on this subject when we get back.
02 02 57 54 CC Yes, sir.
02 02 57 58 CDR It's in hold now.
02 02 58 14 CC Roger. We are timing right now. We will give you a MARK in 10 minutes, and the test will be complete.
02 02 58 20 CDR Roger.
02 03 01 47 CDR Deke, you look like you're wide open today.
02 03 01 52 CC Roger.
02 03 01 54 CDR You got a little spotty cue over Dallas, a little spotty cue offshore. Looks like you have about three- or four-tenths coverage today.
02 03 02 05 CC Okay. I haven't been outside for about 6 hours, so I don't know.
02 03 03 51 CDR Jack, after this G&N burn, do you want us to hold it in SCS like programmed?
Roger. Wally, after we get through this, you've got about 4 minutes left, then hold attitude in the cheapest way possible there.

Roger.

And as soon as we hit the night pass, you are on your own.

Grand Bahamas looked beautiful today.

Say again, Wally.

The Grand Bahamas looked beautiful today. We took a lot of good pictures with the Hasselblad. We got one of Houston, one of Tampa; that's about the rate. It takes about 3 minutes to recock it.

Roger. We copy.

Probably the loop inside is jamming it up. It's in the box itself, not in the lens shutter mechanism and not in the magazine.

Okay. We copy that.

We recommend carrying at least two of these boxes along and the accessories to go with them.

Okay. We copy that.

Roger.

Houston, the water boiler hasn't been boiling since we been - have you been putting all the
heat on the radiator, or making believe it's cool? Over.

02 03 06 24  CC  We've been trying to get the MAX heat on the radiator; we expect it to start boiling here.

We are showing a RAD OUT now of 50.

02 03 06 31  CMP  Roger. So am I, but my glycol evaporator outlet sensor's still seeing 48.

02 03 06 38  CDR  Jack, give me a reading when we go off this DAP control.

02 03 06 42  CC  Roger. You have got about a minute and three-quarters.

02 03 06 45  CDR  Okay. Then I'll fly in SCS for how long?

02 03 06 50  CMP  Looks like it's starting to boil. Let's see if it overshoots.

02 03 06 57  CC  Roger. We concur.

02 03 06 59  CDR  How long will I stay in the SCS mode?

02 03 07 03  CC  Stand by one.

02 03 07 07  CMP  Are you observing my steam pressure now?

02 03 07 11  CC  Affirmative. And darkness occurs, Wally, about 51 25, 51 25.

02 03 07 22  CDR  Then we are going to stop holding attitude, right?

02 03 07 24  CC  Affirmative.

02 03 07 25  CDR  Okay.

02 03 07 43  CMP  Houston, Apollo 7. Are you reading my primary evaporator now?
Affirmative, 7.

Roger. Did you note the evaporator outlet temperature overshot all the way down to about 34.

We confirm, and we show it coming back up.

Okay. Apollo 7, we've completed 10 minutes in MIN deadband; you can come out of MIN deadband and go to the cheapest way possible for attitude hold.

Roger. SCS.

Apollo 7, Houston.

Houston, Apollo 7. Go ahead.

Roger. We feel that for all purposes your primary evaporator is working normally. You can discontinue attitude holding.

Roger. All channels OFF.

Roger.

Do you want us to go ahead and operate the glycol evaporator then, and see if we have a reoccurrence of the earlier trouble?

That's affirmative, and we will watch it, too.

Thank you.

ASCENSION (REV 33)

Apollo 7, Houston through Ascension.

Apollo 7. Roger. Loud and clear.

We're standing by.
02 03 20 31  CDR  Houston, Apollo 7. Do you read?
02 03 20 33  CC    I read you five-by. We're standing by.
02 03 20 37  CDR    I took the camera apart and used some nose
                   cream and cleaned up some of the inner gears,
                   and it looks like it is going to do all right
                   now.
02 03 20 48  CC    Roger. Copy. And I have a flight plan up-
                   date on that - the PAD for the star - sextant
                   star count whenever you are ready to copy.
02 03 21 11  CDR    Go ahead with your flight plan update, Jack.
02 03 21 13  CC    Okay. GET SR will be 53 plus 36, roll will be
                   0, pitch will be 92. Delay that roll. Roll
                   will be 4, pitch will be 92, yaw will be 359.
                   GET of sunset minus 12 will be 5h plus 18, roll
                   will be 184, pitch 97, yaw 359.
02 03 22 05  SC    Roger. GET sunrise 53 plus 36, attitude 004
                   for roll, pitch 092, yaw 359. Sunrise minus
                   12 minutes will be 5h plus 18, roll 184,
                   pitch 097, yaw 359.
02 03 22 28  CC    Roger. That's correct.
02 03 22 31  CDR    Okay. Houston, Apollo 7.
02 03 22 35  CC    Go ahead, Wally.
02 03 22 37  CDR    Roger. We still have reservations about the
                   SPS engine. It looks good to us so far, but
                   we don't have any data from you, though.
02 03 22 50  CC    Okay. Stand by.
02 03 26 23  CC  Apollo 7, Houston.
02 03 26 27  CDR  Go ahead.
02 03 26 28  CC  Wally, could you confirm your reservations about the SPS engine? Does that have to do with the GPI movement that you observed?
02 03 26 40  CDR  Negative. We had a mission rule beforehand with the Flight Director that we would not go into the SMS (which is reserved) until we knew that we had a good SPS engine.
02 03 26 55  CC  Okay. We copy.
02 03 26 57  CDR  Roger. I'd like one more ...
02 03 27 00  CC  Okay.
02 03 27 02  CDR  At this point.
02 03 27 04  CC  We understand. Stand by. We'll be - discuss that.

TANANARIVE (REV 33)
02 03 37 34  CC  Apollo 7, Houston through Tananarive.
02 03 37 41  LMP  Roger. We got a report ... angles for the realignment: minus .420, minus .175, plus .149. Are you ... Antares and Peacock, a triangle difference of four balls 1.
02 03 38 03  CC  Roger. Donn, I've got a .175, a .149; I didn't catch the first one.
02 03 38 13  LMP  The first one was a minus .420.
02 03 38 17  CC  .420, a triangle difference of four balls 1, and say again the stars.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 03 38 25</td>
<td>IMP</td>
<td>Antares and Peacock; and on the angles, the first was a minus, second was a minus, the third was a plus.</td>
<td></td>
</tr>
<tr>
<td>02 03 35 34</td>
<td>CC</td>
<td>Roger. Copy. And Walt, is Wally on the line?</td>
<td></td>
</tr>
<tr>
<td>02 03 39 01</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
<td></td>
</tr>
<tr>
<td>02 03 39 05</td>
<td>CDR</td>
<td>Schirra speaking.</td>
<td></td>
</tr>
<tr>
<td>02 03 39 07</td>
<td>CC</td>
<td>Roger. About the SPS problem: after discussion down here, our feeling is that the SPS is GO. However, we have a DAP service module RCS deorbit capability at the present time, and we are within 10 feet per second of an SCS service module RCS deorbit capability.</td>
<td></td>
</tr>
<tr>
<td>02 03 39 39</td>
<td>CDR</td>
<td>Roger. That was our figuring, too. We'd like to hold that reserve as much as possible after the full turn. We'll get to ...</td>
<td></td>
</tr>
<tr>
<td>02 03 39 57</td>
<td>CC</td>
<td>Wally, we aren't able to read you this time. We'll pick you up with that last transmission over Carnarvon.</td>
<td></td>
</tr>
<tr>
<td>02 03 40 06</td>
<td>CDR</td>
<td>Roger.</td>
<td></td>
</tr>
<tr>
<td>02 03 51 43</td>
<td>CC</td>
<td>Apollo 7, Houston through Carnarvon.</td>
<td></td>
</tr>
<tr>
<td>02 03 51 48</td>
<td>CDR</td>
<td>Roger.</td>
<td></td>
</tr>
<tr>
<td>02 03 51 54</td>
<td>CDR</td>
<td>Houston, could you read our DSKY then?</td>
<td></td>
</tr>
<tr>
<td>02 03 52 01</td>
<td>F</td>
<td>Roger. Flight. No data yet.</td>
<td></td>
</tr>
<tr>
<td>02 03 52 03</td>
<td>CC</td>
<td>Apollo 7, we don't have data yet.</td>
<td></td>
</tr>
<tr>
<td>02 03 52 07</td>
<td>CDR</td>
<td>Roger. We have a display. It will take hold in a second. This is our gyro torquing angle.</td>
<td></td>
</tr>
</tbody>
</table>
Okay. Stand by.

Houston. I did the fine align check and used Peacock and Rigel, star angle difference five balls, torquing angles plus 021 minus 049 plus 017. Over.

Okay. Copy that, Walt.

He's back.

Apollo 7, Houston.

Go ahead.

Can you give me a GET - an approximate GET that you did that fine align so that we can compute some gyro drift rates?

Roger. The line was completed at about 51 40.

51 40.

51. Fine align check.

Roger. Copy.

Do you want the first one or the second one, Jack? He did two of them.

Stand by.

The first one was about 51 40. I think that's the one you want for your drift check.

Okay, 7. The first one, 51 40, will be fine.

Roger.

Apollo 7, Houston. Do you also have the time you did the fine align check so we can get that one, too?
02 03 55 19  CMP   That was at 51 51.
02 03 55 22  CC    Okay.
02 03 55 23  CDR   Got that.
02 03 55 25  CC    Roger. Copy that.
02 03 55 39  CC    And - Apollo 7, Houston - we feel that on the
                   basis of what Donn did on the daylight align
                   test, that you can delete that P52 which comes
                   at 55 plus 00 in the flight plan. Do you concur?
02 03 55 59  CDR   Stand by.
02 03 56 02  CMP   ... Roger. We concur.
02 03 56 06  CC    Okay. You can delete it.
02 03 56 08  CDR   Roger.
02 03 56 10  CMP   Jack, if we happen to be in a favorable latitude,
                   I might take another crack at it, but --
02 03 56 16  CC    That's fine with us.
02 03 56 18  CMP   Okay.
02 03 56 59  CDR   Houston, Apollo 7.
02 03 57 01  CC    Go ahead, 7.
02 03 57 03  CDR   Roger. Can you talk about the SPS results now
                   that you had observed on the ground?
02 03 57 09  CC    Go ahead.
02 03 57 11  CDR   Negative. What did you observe?
02 03 57 19  CC    Okay. Stand by.
02 03 57 51  CC    Apollo 7, Houston. On the - we relooked at all
                   the strip charts on the SPS operation: ball
                   valves, the temperatures, everything on the SPS
                   appears normal.
Very good. It seems that way here.

Okay. Real fine —

... information, I would like to have the number 3 burn before I give up the SM RCS budget.

Say again on the SPS number 3 burn.

I would like to get the SPS number 3 burn in before I eat into the SM RCS deorbit budget.

Roger. We're going to look at that.

Roger.

We are about 1 minute LOS Carnarvon; will pick you up in Guam in about 5 minutes.

Roger.

Apollo 7, Houston.

Go ahead.

Roger. Read you five-by.

Roger. We just saw a sunrise in the sextant.

Say again?

Our navigator is excited about sunrise in the sextant.

Roger. If you decide to delete the P52 realign at 55 hours in the flight plan, you may go ahead with your G/N and SPS power down early, at your option.

Houston, Apollo 7.

Go ahead.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 04 06 06</td>
<td>CDR</td>
<td>This will really break you up. We're having competition to see who can get the Exer-Genie first.</td>
</tr>
<tr>
<td>02 04 06 12</td>
<td>CC</td>
<td>Roger. I say again that if you decide to delete that P52 realign at 55 plus 00, you can go ahead and power down the GAN and SPS early, at your option.</td>
</tr>
<tr>
<td>02 04 06 30</td>
<td>CDR</td>
<td>Roger. Understand that. Thank you.</td>
</tr>
<tr>
<td>02 04 08 26</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>02 04 08 31</td>
<td>CC</td>
<td>Go ahead, 7.</td>
</tr>
<tr>
<td>02 04 08 32</td>
<td>SC</td>
<td>Roger. We have the S-IVB in sight at this time through the sextant.</td>
</tr>
<tr>
<td>02 04 08 36</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 04 08 38</td>
<td>LMP</td>
<td>How far away is it now, Jack?</td>
</tr>
<tr>
<td>02 04 08 40</td>
<td>CC</td>
<td>Stand by. I'll get it.</td>
</tr>
<tr>
<td>02 04 08 43</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>02 04 08 47</td>
<td>CC</td>
<td>Stand by one; we'll get it up to you.</td>
</tr>
<tr>
<td>02 04 08 50</td>
<td>LMP</td>
<td>Jack, by the way, the slot panel light that wasn't lighted —</td>
</tr>
<tr>
<td>02 04 08 53</td>
<td>CC</td>
<td>Stand by.</td>
</tr>
<tr>
<td>02 04 08 57</td>
<td>CC</td>
<td>Say again, 7.</td>
</tr>
<tr>
<td>02 04 08 58</td>
<td>LMP</td>
<td>The slot panel light that was not lighted was the minus Z panel.</td>
</tr>
<tr>
<td>02 04 09 05</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>02 04 09 12</td>
<td>LMP</td>
<td>Minus Z, as in Zebra.</td>
</tr>
<tr>
<td>02 04 09 48</td>
<td>CC</td>
<td>Apollo 7, Houston. The S-IVB is 312 miles away.</td>
</tr>
</tbody>
</table>
Roger. We're seeing it loud and clear in here. I don't know if it will hold up throughout the entire day pass because when I get this orange background from the six liner pad, it might blot it out, but I'll keep you advised.

Okay. You are 1 minute LOS Guam; Hawaii in 7 minutes.

Roger.

Jack, do you have a map update for us?

Roger. We'll get you one. If I lose you here, we'll get it to you over Hawaii.

Roger.

Apollo 7, ready with the update?

Roger.

Okay. REV 33 GET of the node 52 plus 04 plus 32, longitude 139.2 degrees east, right ascension 05 plus 54.

HAWAII through GUAYMAS (REV 33)

Apollo 7, Houston through Hawaii.

Hello, Houston. Roger. ... that S-IVB - I think what happened is the auto optics quit working, or it wasn't working right, and I saw it go out of the top of the sextant, and I never was able to recover it.

Roger. Copy.

Up to the time it happened, it seemed to be working pretty well. I had done a few marks,
and it appeared to be pulling it in a little closer to the center although not as well as it had done on the previous run.

02 04 18 4B CC Okay. We copy that.
02 04 18 51 CDR I think it deserves a pretty good plus so far.
02 04 19 01 CC Apollo 7, I didn't copy the last part.
02 04 19 03 CDR Roger. This is CDR. I say it deserves a pretty good plus so far.
02 04 19 07 CC Okay. Real fine.
02 04 19 14 CDR Don't want the boys in Boston to get too excited yet.
02 04 19 18 CC Roger.
02 04 29 10 SC Why did the top of the band ...?
02 04 31 00 CDR ... Magazine Q, frame 20, Baja California.
02 04 31 05 CC Roger. Copy.
02 04 31 09 CC Wally, coming over Texas in about 5 or 6 - 3 or 4 minutes, we'd like you to turn your S-band volume up, and we're going to be transmitting S-band only.
02 04 31 24 CDR Roger. At 21 east coast, west coast, Baja California, and we'll shoot Guaymas shortly.
02 04 31 31 CC Okay.
02 04 31 38 CMP Give us a call when you want the volume up, Jack, 'cause --
02 04 31 42 CC Okay. You can turn S-band volume up now; we are just about to acquire Texas.
Correction on Guaymas that ... and upper third of Baja California.

Roger.
The Hasselblad is working fine with a combination or oral grease removal and nose cream.

**TEXAS through ANTIGUA (REV 33)**

Roger. Copy that.

Apollo 7, Houston. Transmitting S-band for backup check.

Roger. We read you loud and clear.

You are five-by.

Roger.

Mexico looks very nice today; a lot of strato cu. It looks like it would be good weather for the Olympics.

Roger. Copy that.

**HAWAII through GUAYMAS (REV 34)**

Frame 26, magazine Q was a straight shot down at the coast of Mexico just south of Monterrey.

Roger. Copy.

Looks like a nice day to be on the beach.

It sure does.

What's your temperature down there today?

It's pretty nice down here; we had fog in the morning.
02 04 36 07 CDR Roger. Magazine Q, frame 24, eastern coast of Mexico.

02 04 36 32 CDR Hello, Houston. This is your captain speaking as we fly across the Gulf of Mexico where we are clear to the Yucatan Peninsula. The west coast of the Yucatan looks loud and clear, and we will give you a report on clouds on arrival.

02 04 36 44 CC Okay. And we are going back to VHF in just a few minutes here so you can turn the S-band volume down in about 2 minutes.

02 04 36 54 CDR Roger.

02 04 38 02 CDR Twenty-five and 26 west coast and Yucatan Peninsula west coast on VHF. We are crossing ... now.

02 04 38 07 CC Roger. Copy.

02 04 38 57 CDR We are referring to magazine Q for Queen.

02 04 39 00 CC Roger.

02 04 45 07 CMP Frame 75, a river in northeastern South America.

02 04 45 18 CC Roger. Copy.

02 04 45 23 CMP Sounds like you got some nice scenic music ...

02 04 45 26 CC Roger.

02 04 45 40 CC Apollo - Apollo 7, Houston. Could we get you to switch the BIOMED switch to the CDR?

02 04 45 48 CMP I think that's a portion of "Fools Rush in Where Angels Fear to Tread."

02 04 45 56 CC Roger. We copy your switch position.

02 04 45 59 CMP Roger. Are you playing music, Jack?
We hear a song, "Fools Rush in Where Angels Fear to Tread." That's why the remark. We have some real good music up here.

It isn't me.

Okay. How's the readout this time?

It's a Houston radio station; just heard the call. It's FM, probably.

You might call around town and find out who played "Fools Rush in Where Angels Fear to Tread" at about 52 hours and 26 minutes - 25 minutes.

Roger. We copy.

ASCENSION (REV 34)

Apollo 7, Houston. Standing by, Ascension.

Roger. We read you loud and clear.

Roger.

Gaido, CAP COMM.

Apollo 7, Houston. I have a fight plan update.

Apollo 7. Go ahead with your update.

Roger. The time, 54 plus 40; H₂ heaters ON; at 55 plus 00, H₂ fuel cell purge.

Roger. That's 54 plus 40 and hydrogen purge at 55 00.

Roger. At 57 plus 50, O₂ - oxygen fuel cell purge.
02 05 13 26 CMP Roger. O₂ purge at 57 50.
02 05 13 31 CC Roger. End of update.

GUAM (REV 3h)

02 05 38 41 CC Apollo 7, Houston. Standing by Guam.
02 05 38 47 CDR Roger. Loud and clear.
02 05 38 48 CC Roger.
02 05 40 12 CDR Houston, Apollo 7.
02 05 40 34 CDR Houston, Apollo 7.
02 05 41 02 CC Apollo 7, Houston. Were you calling?
02 05 41 05 CDR Roger. ... I had a butterscotch pudding bag failure. ... It failed as I was rolling it up to stow it.
02 05 41 21 CC Say again, Wally.
02 05 41 25 CDR I had a food bag failure that failed when I was rolling it up empty to stow it.
02 05 41 31 CC Roger. Understand.
02 05 41 35 CDR No problem. I can still see 50 stars at this time at this attitude. There is a kind of a light square forming in the middle of the States ... 
02 05 41 53 CC Roger. And you say the count is 50?
02 05 41 59 CDR More than 50; more than 50.
02 05 42 01 CC Greater than 50. Roger.
02 05 42 03 CDR ... plus 4 minutes.
02 05 42 48 CDR Okay. This time a light is beginning to creep into the sextant - into the telescope all around.
the edge, and there is a big, broad band of light across the center and a blob down at the bottom; and this light is slowly increasing in intensity, and I suspect that in a few minutes it's gonna blot out the whole field of view.

02 05 43 07 CC Roger.
02 05 44 51 CDR Roger. At 44, I see ten stars. I can see Orion's belt and the four corner stars and Sirius and, oh, a handful of others scattered around. There's about 10-12 stars.
02 05 45 43 CC Roger.
02 05 45 44 CC Thirty seconds LOS.
02 05 45 46 CDR Roger. We are with you.

HAWAI'I through TEXAS (REV 34)

02 05 54 29 CC Apollo 7, Houston. Request onboard batt C voltage at your convenience.
02 05 54 37 IMP Roger.
02 05 54 48 IMP Roger. I've got battery C, 37 volts.
02 05 54 52 CC Roger. Thirty-seven.
02 05 54 55 IMP Has anybody taken a good look at the total battery load we have on batt A, batt D? I know we didn't get back as much as we expected to on battery A yesterday.
02 05 55 11 CC That's affirmative, Walt. We are looking at it.
02 05 55 23 IMP Hey.
02 05 55 26 IMP Hey, Ron.
02 05 55 28 CC Go.
I'm in favor - I guess I'm leaning toward another battery charge, if necessary, a little further down the plane.

I see what you are saying. You think that we may require another battery charge later on sometimes.

Houston, Apollo 7.

Houston. Go.

Roger. We are standing by our second tissue bag at 54 hours into the flight.

Roger. Your second what?

Our second bag of tissue.

Incidentally, you might note that the ORDEAL storage box - after the ORDEAL is out and closed up again - makes a nice little locker for stuffing things into. The little hole that's open - you can stuff it in; then later dump it into the empty tissue box.

Roger.

Houston, Apollo 7. Frame 34 on magazine Q, clouds approaching the western coast of Mexico.

Say again, Walt. Opposite omni.

Approaching west coast of Mexico, frame 34, magazine Q, cloud formation.

Frame 30 Baja California; frame 31 will be of LaPaz.

Apollo 7, Houston. Say again.
02 06 07 45 LMP Frame 30 Baja California, frame 31 LaPaz.
02 06 07 51 CC Roger.
02 06 09 03 LMP Frame 32, Puerto Vallarta.
02 06 09 06 CC Roger.
02 06 09 09 SC ...

HAWAII through TEXAS (REV 35)
02 06 12 18 CC Apollo 7, Houston. Thirty seconds TOS. Tananarive at 46 minutes.
02 06 46 41 CC Apollo - Apollo 7, Houston. Tananarive standing by.
02 06 46 46 LMP Roger. We've logged another food bag failure, and we powered down at 54 35 for a drifting site configuration.
02 06 47 06 CC Say again time, Walt.
02 06 47 08 LMP At 54 35, we powered down to the drifting site configuration, and I have another food bag failure to report.
02 06 47 17 CC Roger. How did the second one fail?
02 06 47 20 LMP I had the second one, and it was A3, AOB for the LMP - the chocolate pudding. But the failure occurred at the spout where it comes out at the eating end, and it seems to have given away near the ...
02 06 48 00 LMP Did you receive, Houston?
02 06 48 06  CC  Walt, I got part of that, but I couldn't get it all. Chocolate pudding bag failed, but I'm not sure how, yet.

02 06 48 12  IMP  Okay. It failed at the eating end. It was not one of the external seams, but it made it impossible to eat it.

02 06 48 22  CC  Roger. I understand now.

02 06 48 24  IMP  Chocolate pudding A3, A0B.

02 06 48 31  CC  Roger.

02 06 48 35  IMP  That last pass along the western coast of Mexico, we got several nice pictures of the Las Cruces harbor and Acapulco, Mexico.

02 06 48 48  CC  Roger.

02 06 49 29  CDR  Houston, Apollo 7.

02 06 49 31  CC  Houston. Go.

02 06 49 33  CDR  Roger. I'd like to give a report on the way we're eating. We're eating, I'd say, as much as we can get down, which is about two meals a day, so far.

02 06 49 48  CC  Roger.

02 06 49 50  CDR  Donn Eisele may change the pace. He eats about two and a half meals a day.

02 06 49 57  CC  Roger. Donn is a big eater.

02 06 50 01  CDR  Say again?

02 06 50 03  CC  Roger. Donn is the big eater.

02 06 50 06  CDR  That's a fact.
We've been on the Exer-Genie now as much as 30 minutes at a time, and we've doubled the workload on it, and there's not much more we can do. If we're not hungry, we don't eat. I think we're all feeling pretty chipper; there's no discomfort up here. My cold is improved considerably.

A subject that we are concerned about is the chlorination of the drinking water. We're drinking about as much as we can. I'd say that we've drunk enough water to lower the quantity sufficiently to have a chlorine check.

Say again, Wally.

Apollo 7, Houston. Say again about the chlorine and potable water.

The advisability of adding chlorine on schedule to the potable water.

Apollo 7, Houston. Thirty seconds to LOS; Mercury at 09.

Apollo 7, Houston through Mercury.

Roger. Do you read that?

Roger. You're a lot better this time. Can you say again your question about the potable water and chlorination?
Yes, Ron. We - adding chlorine to the water quantity that has not decreased since we've been taken off practically. And if the taste of the chlorine has not bothered us yet, but we feel we haven't taken enough water out of there to warrant adding chlorine on a 24-hour basis.

Okay. Understand your question now, and we'll check into it.

Roger.

Apollo 7, Houston. Opposite omni.

Roger.

This is Apollo 7.

Houston. Go.

At approximately 20 minutes ago, the prime rate evaporator ran into the same kind of problem it had earlier in the flight. The steam pressure went all the way down peg low, and they could not increase it by going to MANUAL and the INCREASE switch. I reserviced it for 2 minutes and operated manually for another couple of minutes and finally went back to AUTO. And it's been running fine for the last 20 minutes - maybe longer - I guess more like about 30 minutes ago.

Roger. We copy.
 Apparently, it's a case of the evaporator drying out instead of the evaporator being frozen.

Roger.

I couldn't get too many details about the 2TV-1 test, but it seems to me it could be similar to what happened in the chamber a couple of times. And there might be something we could bring up to maybe get it fixed before the next flight.

Roger. Concur.

Apollo 7, Houston.

Go.

Roger. We would like to confirm that you have completed the H₂ fuel cell purge.

That's affirmative. Completed at approximately 4 minutes past the hour.

Roger. Thank you.

HAWAII (REV 35)

Apollo 7, Houston. Standing by Hawaii.

Apollo 7, Houston. You were real weak. Say again.

Log ten clicks H₂O IMP; six clicks CMP; 15 clicks CDR, and two aspirins CDR.

Roger. Copy that.

7 from Houston.
Go ahead.
You might be interested to know that the 
Oilers blanked Boston 16 to 0.

Very good. They must have received our picture 
by now.

They're still in the running.

Huntsville cannot acquire. Two-way signal too 
low.

Huntsville LOS.

Apollo 7, Houston. One minute LOS. Tananarive 
at 20 minutes.

Thank you.

Huntsville AOS.

Huntsville LOS.

TANANARIVE (REV 36)

Apollo 7, Houston. Tananarive standing by.

Received your message Apollo 7. Roger.

Roger.

Hey, Ron. Can you give me a readout on my 
hydrogen manifold pressures if I turn my 
valve ... 

Not this pass, Walt. We have no data here. 
We should be able to pick that up over 
Mercury, though.

Thank you.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 08 45 00</td>
<td>CC</td>
<td>Apollo 7, Houston, Mercury.</td>
</tr>
<tr>
<td>02 08 45 07</td>
<td>CDR</td>
<td>Roger. Read you loud and clear. How me?</td>
</tr>
<tr>
<td>02 08 45 09</td>
<td>CC</td>
<td>Roger. Loud and clear. We have data; we can check your O₂ manifold pressures.</td>
</tr>
<tr>
<td>02 08 45 35</td>
<td>CDR</td>
<td>Delay this cut, okay?</td>
</tr>
<tr>
<td>02 08 45 47</td>
<td>CDR</td>
<td>Houston, Apollo 7. Do you read?</td>
</tr>
<tr>
<td>02 08 45 49</td>
<td>CC</td>
<td>Houston. Say again.</td>
</tr>
<tr>
<td>02 08 45 51</td>
<td>CDR</td>
<td>Roger. We'll have to delay this test.</td>
</tr>
<tr>
<td>02 08 45 55</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 08 47 46</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>02 08 47 51</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>02 08 47 52</td>
<td>CC</td>
<td>Roger. You're GO on chlorinating. Just draw a little bit out before you chlorinate.</td>
</tr>
<tr>
<td>02 08 48 02</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 08 48 47</td>
<td>CDR</td>
<td>Houston, frames 45 and 46 of magazine Q were shot 1 minute ago.</td>
</tr>
<tr>
<td>02 08 48 54</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>02 08 49 02</td>
<td>CC</td>
<td>Apollo 7, Houston. Opposite omni.</td>
</tr>
<tr>
<td>02 08 51 20</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS. S-band volume up at 57 plus 03.</td>
</tr>
<tr>
<td>02 09 51 28</td>
<td>CDR</td>
<td>57 03.</td>
</tr>
<tr>
<td>02 09 02 41</td>
<td>CC</td>
<td>HAWAII (REV 36)</td>
</tr>
<tr>
<td>02 09 02 52</td>
<td>CC</td>
<td>Apollo 7, Houston at Hawaii.</td>
</tr>
<tr>
<td>02 09 02 53</td>
<td>CDR</td>
<td>Roger, Houston. Loud and clear.</td>
</tr>
<tr>
<td>02 09 02 56</td>
<td>CC</td>
<td>Roger. Same.</td>
</tr>
</tbody>
</table>
02 09 03 22  CC  7, Houston. I have block data to pass up, and also, we are standing by for the O2 thing if you want to do them.

02 09 04 07  CDR  Okay. Ready to go on the block.

02 09 04 10  CC  Roger. 039 slant 3 Bravo plus 212 plus 1345 061 plus 17 plus 53 4900, 040 dash Alfa Charlie plus 007 minus 0199 062 plus 07 plus 40 4365, 041 dash Alfa Charlie plus 13 minus 0296 063 plus 43 plus 46 4168, 042 dash 2 Alfa plus 229 minus 0269 065 plus 19 plus 43 4128, 043 dash 1 Charlie plus 206 minus 0549 066 plus 47 plus 22 4129, 044 minus 1 Alfa plus 257 minus 0649 068 plus 20 plus 59 41 44. Over.

02 09 06 43  CDR  Roger. Readback follows: 039 slash 3 Bravo plus 212 plus 1345 061 17 53 4900, 040 slash Alfa Charlie plus 007 minus 0199 062 07 40 4365, 041 Alfa Charlie plus 13 minus 0296 063 43 46 4168, 042 —

02 09 07 38  CC  Apollo 7, Houston.

02 09 07 39  CDR  Roger. I switched omni. Where did I leave it?

02 09 07 42  CC  Roger. Start again with REV 42.

02 09 07 48  CDR  Roger. 042 2 Alfa plus 229 minus 0269 065 19 43 4128, 043 1 Charlie plus 206 minus 0549 066 47 22 4129, 044 1 Alfa plus 257 minus 0649 068 20 59 41 44.

02 09 07 21  CC  Apollo 7, Houston. Readback correct.
02 09 07 23  CDR  Are you ready to take care of our O₂ reg?
02 09 07 26  CC  Roger. Go.

HUNTSVILLE (REV 36)
02 09 08 32  CDR  Roger. Will you give us a readout now ...
02 09 08 37  CC  Say again.
02 09 08 39  CDR  Will you give us a readout now, and then we will
switch regs?
02 09 08 42  CC  Roger. 105.
02 09 08 45  CDR  Roger. 105.
02 09 08 57  CDR  Okay. Do you get a readout?
02 09 09 00  CC  102.
02 09 09 08  CDR  Roger. UCF's redundant component check is GO.
02 09 09 13  CC  Roger.
02 09 09 39  CC  Apollo 7, better turn S-band volume down.
02 09 10 32  CT  Huntsville. Two wheel on down range.
02 09 11 56  CC  Apollo 7, Houston. One minute LOS. Tananarive
at 58.

TANANARIVE (REV 36)
02 09 59 51  CC  Apollo 7, Houston. Tananarive standing by.
02 09 59 55  CDR  Roger.
02 09 59 56  CC  Roger. Loud and clear.
02 10 00 26  CDR  This is Apollo, and I'm chlorinating the water at
this time.
02 10 00 31  CC  Roger. That's short pass; 1 minute to LOS.
02 10 00 35  CDR  Roger.
Apollo 7, Houston, Mercury. Standing by.

Roger. Loud and clear.

Roger. The same.

Houston, Apollo 7.

Houston. Go.

Roger. For your flight plan status, we've accomplished everything scheduled on the flight plan. We're having a little bit of trouble getting all of the pictures; I think we've got a camera that isn't working too good.

Roger. Is this the Hasselblad that's not working too good?

Roger. We've got it fixed, so it's ticking along now.

Roger.

We only took two rolls of the S0368 on the 16mm: one for the separation and turnaround maneuver and one on the final phase of the rendezvous. We are going to be using some of it out the window if it seems appropriate.

Roger.

Apollo 7, Houston, Hawaii.

Apollo 7, Houston.
Apollo 7, Houston.
Apollo 7, Houston.
Apollo 7, Houston.
Apollo 7, loud and clear.
Roger. Your number 2 flow proportioning valve has been doing a good job this last rev, and we recommend returning to ECS radiator flow control number 1 by switching to number 1 then back to ANDO.

What's wrong with letting number 2 do the job?
Roger. We just prefer to stay on one as it does a little better.

You mean because it's a smaller number, or what?

Okay. We'll return to one for you. We were wondering when you would spot that.
Roger. We checked it with Mercury the last time around.
We're kinda afflicted today, Ron. Bear with us.
Roger.
Walt, on the battery charging, we're not considering any additional battery charging of A until we observe what happens when we charge battery B.
Roger. I understand, but we probably have reason to expect battery B to go up to about 35 or 36 amp hours too, which shouldn't leave us in very good shape, I don't believe.

Roger. I understand your concern. Also, Walt, we need some command module heater temps when you get a chance. They're five and six, A through D, on your system status. No hurry.

Houston, Apollo 7.

Go.

Apollo 7, Houston. Go.

Roger. About, oh, it must have been a little over an hour and half ago, we had another anomaly like on the first night when Donn was awake; all of a sudden the DC bus 1 went to zero on the readout and A - DC bus light ...

Walt, say again after AC bus light; went through a keyhole there.

Well, something is taking the inverter off of AC bus 1, and we're hitting the RESET, but they're right back on again ...

Roger. It looks like the same thing that happened to Donn, then.

I'd say that it is.
02 10 53 34  LMP  Go ahead.
02 10 53 39  CC  Apollo 7, Houston. Could you confirm that when you had the AC fail, was it an AC bus or an AC overload light?
02 10 53 49  LMP  ... bus light or overload.
02 10 53 55  CC  Say again, Walt.
02 10 53 57  LMP  ...
02 10 54 05  CC  You're awful weak, Walt. Say again.
02 10 54 27  CC  Apollo 7, Houston.
02 10 54 32  LMP  Houston, Apollo 7. Did you read my last communication?
02 10 54 35  CC  That's negative. Say again.
02 10 54 38  LMP  Roger. I had AC bus 1 light on, no overload. The inverter was automatically disconnected, and I'm wondering if there isn't some possibility of having trouble with that inverter putting out an overvoltage?
02 10 54 56  CC  Roger. We're working on this. Can you associate this with anything else that was going on at that time?
02 10 55 02  LMP  That's negative.
02 10 55 07  CC  And it wasn't associated then with the flow proportioning valve switchover?
02 10 55 14  LMP  Not associated with anything that I can think of.
02 10 55 18  CC  Roger. You're not giving us much help.
02 10 55 26  CDR  This one is going to be a witch hunt, Ron.
02 10 55 29  CC  I think so.
02 10 55 31  CDR  This is one of those things that sort of happened. It's also the reason why we're going to keep somebody on watch all the time.
02 10 55 41  IMP  Yes, I don't think there's anything you can do about it, Ron. I'm just reporting that we have had it happen twice.
02 10 55 47  CC  Okay. We're scratching our brains down here to see if maybe we could come up with something.
02 10 55 54  CDR  It'll give you something to do during passes anyway.
02 10 55 57  CC  Roger.
02 10 59 05  CC  Apollo 7, Houston. One minute LOS; Ascension at 19.
02 10 59 11  CDR  Roger.
02 11 19 39  CC  Apollo 7, Houston, Ascension. Standing by.
02 11 22 29  CC  Apollo 7, Houston, Ascension. Standing by.
02 11 22 33  CDR  Roger. Loud and clear.
02 11 22 36  CC  Roger. Same.
02 11 24 04  IMP  Houston, Apollo 7. Can you give me an update for AMP, please?
02 11 24 09  CC  Roger. Stand by.
02 11 24 23  CC  Apollo 7, Houston. Ready to copy.
02 11 24 27  IMP  Okay. Ready to copy. Go.
02 11 24 29 CC Roger. REV 38, GET NODE 59 plus 32 plus 03, longitude 24.7 east, right ascension 05 plus 44.

02 11 24 51 IMP Say the longitude again, please.

02 11 24 51 CC Longitude 24.7 east.

02 11 25 01 IMP Was that 24.7?

02 11 25 03 CC Roger. 24.7.

02 11 25 06 IMP Thank you.

GUAM (REV 38)

02 12 01 48 CC Apollo 7, Houston, Guam. Standing by.

02 12 05 11 CC Apollo 7, Houston. One minute LOS; Redstone at 26.

02 12 05 19 IMP Roger. We'd like to give the results of the rendezvous radar self-test and confer on the use of the rendezvous radar power and heater switch. Would you pass that up to us, Ron?

02 12 05 36 CC Say again, Walt.

02 12 05 38 IMP We have to know the exact position of the rendezvous radar heater and power switch so we can use the rendezvous radar self-test. We don't have that on board with us.

02 12 05 53 CC Roger. Awful hard to understand. Something about a power switch, and I'll guess which one. I'll find out.

02 12 05 58 IMP Rendezvous radar power switch, and it's a pre-positioned switch, the other end of it ...

02 12 06 07 CC Roger.
02 12 26 22 CC Apollo 7, Houston through the Redstone.
02 12 26 49 CC Apollo 7, Houston, Redstone.
02 12 26 52 CDR Roger. Read you. How me?
02 12 26 54 CC Roger. A little weak, but clear.
02 12 26 57 IMP Roger. Do you have the data on the radar transponder test?
02 12 27 02 CC Affirmative. Are you ready to copy?
02 12 27 10 CDR Go ahead.
02 12 27 11 CC Roger. The rendezvous transponder power switch: you put it to HEATER for 1 minute and then to POWER for the self-test. By the way, you leave it 24 minutes in HEATER if you are going to really operate it. Systems test left hand, the TRANSPONDER, right hand to Alfa. Indicator should be 1 to 5 volts. Systems test right hand to Bravo. Indicator 2, plus or minus 1 volt. Systems test right hand to Charlie. Disregard the indicator. Systems test right hand to Dog. Indicator should be 0 to 4.5 volts. Over.
02 12 28 27 CDR I'm getting very broken; we'll have to wait for Ascension, I think, to get a good separator.
02 12 28 37 CC Roger.
02 12 28 40 CDR Do you read, Apollo 7?
02 12 28 42 CC Apollo 7, Houston. Roger. Read you now.
02 12 28 46 CDR Roger. You might try it again. You were broken the first time, and I couldn't read you at all.
02 12 28 51 CC Roger. Rendezvous transponder power switch goes to HEATER for 1 minute, then to POWER.

02 12 30 39 CC Apollo 7, Houston. Is the COMM any better now?

02 12 30 44 CDR Roger. Sounds clear now. You want to try to read that off again?

02 12 30 47 CC Roger. The radar transponder power switch goes to HEATER for 1 minute, then to POWER. Systems test left hand to TRANS Pon D er, right hand to Alfa. Your indicator, 1 to 5 volts. 7, Houston. You copy so far?

02 12 31 31 CDR Let's try to pick you up at Ascension.

02 12 31 36 CC Roger. We'll try Ascension then.

02 12 31 39 CDR Roger.

02 12 34 21 CC Apollo 7, Houston. One minute LOS; Ascension at 52.

ASCENSION (REV 39)

02 12 52 59 CC Apollo 7, Houston.

02 12 53 05 CDR Houston, Apollo 7.

02 12 53 08 CC Roger. I can continue with that transponder check now if you want.

02 12 53 12 CDR I think I have the data for you if you're ready to copy.

02 12 53 17 CC Roger. Ready.

02 12 53 19 CDR It's the heater tubes. Alfa 3.2, Bravo 1.8, Charlie .45, Delta 0.

02 12 53 32 CC Roger. I'll read back: 3.2, 1.8, 0.44, and 0.
02 12 53 41  CDR  That is correct. DELTA-V to tab over to .1 at the most.
02 12 53 47  CC  Roger.
02 12 54 02  CC  Apollo 7, Houston. Be advised of warmup time for the real test on that thing is 24 minutes.
02 12 54 11  CDR  Roger. And we'll be using 1 minute, right?
02 12 54 14  CC  Say again.
02 12 54 21  CDR  Apollo 7. Roger.
02 12 54 25  CDR  Houston, Apollo 7.
02 12 54 27  CC  Houston. Go.
02 12 54 29  CDR  We finally proved our point on the chlorine; it tastes horrible right now.
02 12 54 37  CDR  It's 2 and 1/2 hours after injection.
02 12 54 42  CC  Roger. We understand.
02 12 54 45  CDR  We've been asking about this for a long time, and now we will just have to wait or consider using the survival kit water if it's necessary.
02 12 55 00  CC  Roger.
02 12 58 14  CC  Apollo 7, Houston.
02 12 58 17  CDR  Apollo 7. Go.
02 12 58 19  CC  Roger. We see no BIOMED downlink on the IMP.
02 12 58 34  CDR  I wanted to fly; now I got to go get it up.
02 12 58 42  CC  Say again, Wally.
02 12 58 46  CDR  Roger. We've got the cable all hooked up.
02 12 58 50  CC  Roger.
We're getting down to keeping only one man on watch at a time, and that's going to answer a lot. He's not sleeping, just milling around, staring, and housekeeping.

... 

Say again.

You want LMP now?

How are you reading my heart?

Stand by.

Is my heart coming in five-by-five?

Roger, Walt. We have it now. Thank you.

Apollo 7, Houston. Thirty seconds LOS; Mercury at 28.

Roger.

Apollo 7, Houston. Acquisition Mercury.

Houston, Apollo 7. Do you read?

Apollo 7, Houston. Go.

Roger. We had a traumatic experience up here that kept us up half the night. ... one of the reasons is we had two regs shut down and power outage which came back immediately afterwards. And we had a ground ... right after that which didn't last too long and now a readout on the caution and warning panel. Over.
02 13 30 45 CC Apollo 7, Houston. I will call you again in about 30 seconds. The signal is very poor. All copied is something about caution and warning panel.

02 13 31 32 CC Apollo 7, Houston. You are unreadable right now.

02 13 31 33 CDR Houston, Apollo 7. Say again.

02 13 34 00 CC Apollo 7, Houston. How do you read?

02 13 34 03 CDR Okay. Did you read my last? ...

02 13 34 15 CC Apollo 7, Houston. I read you about strength one and virtually unreadable.

02 13 34 23 CDR Roger. Do you read me now?

02 13 34 25 CC Roger. That is much better. Go.

02 13 34 30 CDR Apollo 7, say again.

02 13 34 32 CC Apollo 7, Houston. At acquisition Mercury, you gave me a transmission. All I copied was something about caution and warning panel. Would you say again?

02 13 34 48 CDR Houston, this is Apollo 7. Just prior to crossing the Red Sea, we lost AC bus 1 and AC bus 2. ...

02 13 35 20 CC Apollo 7, Houston. Understand just after crossing the Red Sea, you lost AC bus 1 and AC bus 2. You have obtained RESET. I am going to wait over Guam and go with this
again. I am missing too much of the trans-
mission.

Roger. We're up here standing by.

Apollo 7, Houston. How do you read?

Roger. Loud and clear.

Okay. I am sorry to have you repeat this
again. But I did not get the full message
there. I got something after passing the
Red Sea. You had AC bus 1 and AC bus 2 fail.
You did get RESET on both buses. Is that cor-
rect?

That is correct, approximately 61 hours and
14 minutes. About 9 minutes earlier, we had
a master alarm, but no caution and warning
lights indicated.

You had no caution and warning lights.

That was 9 minutes earlier. If you recall,
we had a bit of ghosts earlier in the mission.
We also had an AC 1 bus failure when we lost
a compressor twice, and it came back up again.
Apparently, we've got a trend here that I'd
like to have more information about.

Roger. Understand. You think it is a ghost.

Now - just to make sure I have it correct.
You do have both AC buses working normally now.
That is correct. I am not sure kind — what kind of ghosts we have, but we have had master alarms and no indication as to the cause.

Thank you.

Hey, Bill. We got one more thing that may or may not be significant, but after I reset the first master alarm with no caution or warning light, I checked the currents on all the fuel cells, and we were averaging a little over 20 amps per fuel cell, and now we are back to about 15. And, at first, I attributed that to a cycling load. I don't know; it could possibly have been AC loads. I don't know.

Roger. Understand. Immediately after RESET, you monitored the fuel cell currents at 20.0 amps, and they are now reading 15.0.

That is a negative. After the master alarm, with no caution or warning lights, at 61 09 is when I noticed the fuel cell currents. The other two caution and warning alarms when the bus failed were 61 14. Over.

Roger.

If we sound puzzled now, we were not then.

Roger.

Apollo 7, Houston. We are getting a tape dump here at Guam, and we will be taking a look
at it and be trying to give you a call at Redstone on this.

02 13 39 15  CDR  Okay. There is not much we can do right now, but I would like to find out what we have left if this continues.

02 13 39 21  CC  Roger.

02 13 39 23  CDR  All I know is that there is a lot ... coins in the water.

02 13 39 27  CC  Understand.

02 13 41 10  CC  Apollo 7, Houston. One minute till LOS Guam; Redstone at O1.

02 13 41 25  CDR  Roger.

02 13 41 31  CC  And - Apollo 7, Houston - I would like to confirm a canister change at around the 58-hour point.

02 13 41 43  CDR  That's affirmative.

02 13 41 44  CC  Thank you.

REDSTONE (REV 39)

02 14 01 25  CC  Apollo 7, Houston.

02 14 01 29  CMP  Roger, Houston. Go ahead.

02 14 01 31  CC  Roger. I was a bit optimistic. It'll take a little longer to look at those tapes, but we did get a dump over Guam, and we'll be giving you our analysis of the situation as soon as we get it. In the meantime, I'd like to go back over my notes and make sure
that I have the story correct. Okay. The way I have it: at 61 plus 09, you got a master alarm light with no caution and warning lights? You reset the master alarm. Okay.

At that time, fuel cell current was averaging 20.0 each. At 61 plus 14, you got an AC 1 and an AC 2 fail. You reset both AC 1 and AC 2 successfully. At the time that you were talking to me, about 61 plus 30, the fuel cells were averaging 15 amps, one-five amps. That is the story as I have it copied.

Apollo 7, Houston. Did you read?

Houston, Apollo 7. You read?

Roger. Apollo 7, Houston. How do you read me?

Read you fine now. How me?

I read you about four-by-four. Did you get my transmission there?

Affirmative. The details are correct. The time was 61 plus 05 for the master alarm and 61 plus 14 for the bus fail.

Apollo 7, Houston. Copied the correction, 61 plus 05 for the master alarm.

And the fuel cell loading may or may not be significant. That was the third AC bus 1 failure we've had and the first AC bus 2 failure,
and my best on-board analysis is to track it
down to a transient overvoltage, but guiding
onto both buses, which seems kind of difficult.

Roger.
Did you read?
Houston, Apollo 7. Did you read?
Roger. Go.
Did you read my last transmission, Bill?
Roger. Understand. You have - this is the
third AC 1 failure, the first AC 2 failure
that you've experienced. You are doubtful -
you are in question as to how a transient
overvoltage can throw both AC's off line.
Is that your question?
That's affirmative.
Okay. We're looking at it. We will be look-
ing at that and trying to give you a complete
story as soon as we can put it together.
Okay. And confirm we have a good tape running
now.
Stand by.
Apollo 7, Houston. We are rewinding the tape
now. The tape will be yours at LOS.
Roger. Thank you.
LOS in about 3 and 1/2 minutes.
Apollo 7, Houston. Coming up on LOS Redstone;
Ascension at 27.
Roger. We'll be standing by.
And the tape recorder is yours now.
Understand?
Houston, this is Wally. Houston, this is Wally.
Go.
Roger. You might just check into our configuration on the last minute variance on inverter safety wiring.
Roger. Check into the inverter safety wiring.
There's a new change in the glitches that they had at the plant.
Roger.
I think Wally's referring to the change where they disconnected the overload transit.
ASCENSION (REV 40)
Apollo 7, Houston.
Apollo 7, Houston.
Roger. Houston, Apollo 7. Go.
Roger. AOS Ascension, and we're still studying the problem.
Okay.
No sweat here right now. Everything's normal.
Roger. We just finished the playback and are still looking at it.
Good show. Walt and Wally are sacking out, so I'll be minding the store in the meantime.
Okay, Donn.

Apollo 7, Houston. One minute LOS Ascension; Mercury at 04.

GUAM (REV 40)

Apollo 7, Houston.

Roger. Houston, Apollo 7.

Roger. Acquisition Guam.

Roger.

Apollo 7, Houston. About 1 minute 30 seconds LOS Guam. Redstone at 36, and we'd like to confirm BIOMED switch center.

Roger. Stand by. Switch at center.

Roger. Understand. It is at center.

REDSTONE (REV 40)

Apollo 7, Houston. Acquisition Redstone.

Apollo 7, Houston.

Houston, Apollo 7. You're very weak. Go.

Roger. We detected a CMC power-up over Guam. Was that a valid reading?

That is correct. I powered it up and went state vector integrate up and put it back down.

Okay. Thank you.

Apollo 7, Houston. One minute to LOS Redstone; Canary 07.

Roger.
02 16 07 09  CC  Apollo 7, Houston. Acquisition Canary.
02 16 07 14  CMP  Roger. Houston, Apollo 7.
02 16 07 17  CC  Roger. Just for your information, we have about a 6 and 1/2 minute pass here, and then it's going to be about 1 hour before we pick you up, and that'll be over the Redstone.

REDSTONE (REV 41)

02 17 11 11  CC  Apollo 7, Houston.
02 17 11 27  CC  Apollo 7, Houston.
02 17 11 44  CC  Apollo 7, Houston.
02 17 11 49  CMP  Roger. Houston, Apollo 7. Go.
02 17 12 03  CC  Apollo 7, Houston. How do you read me?
02 17 12 46  CC  Apollo 7, Houston. How do you read?
02 17 13 05  CC  Apollo 7, Houston. How do you read?
02 17 13 47  CC  Apollo 7, Houston. Switch Omni, please.
02 17 14 00  CC  Apollo 7, Houston. How do you read?
02 17 14 06  CMP  Read you five-by, Bill.
02 17 14 08  CC  Okay. Good. I wanted confirmation because I'm going to read off a fairly lengthy procedure.
02 17 14 25  CMP  Okay. Fine. Stand by, and I'll get something to write it down on.
02 17 14 32  CMP  Go ahead with your procedure.

CANARY (REV 41)
Okay. You can probably do it as I call it out.

First, which AC bus is powering the following:
cabin fan?

Roger. Cabin fans are OFF.

Roger. Cabin fans are OFF. Next, glycol pump.

Stand by. Glycol pump on AC1.

Roger. Glycol pump on AC1. Next, suit compressors.

Suit compressors on AC1.

Roger. AC1. Do not change configuration.

Roger.

Okay. Number two. We would like for you to check the six CRYO fan circuit breakers on panel 226 and report if any are popped, but do not push them in.

Stand by.

Roger. All the CRYO breakers are in.

Roger. Understand all of them are in. Thank you very much.

Opposite omni, please.

Roger. Stand by.

Apollo 7, Houston. We would like you to switch omni for maximum signal strength. We'd like to get some IM before we have LOS here at Redstone, which is going to occur in about 45 seconds.
ANTIGUA (REV 42)

02 17 31 09  CC  Apollo 7, Houston. Acquisition Antigua.
02 17 32 19  CC  Apollo 7, Houston. Acquisition Antigua.
02 17 32 23  CMP  Roger, Bill. Loud and clear.
02 17 32 25  CC  Roger.
02 17 35 25  CC  Apollo 7, Houston. One minute until LOS Antigua.

Acquisition Canary at 40. I will have a flight plan update at that time.

02 17 35 37  CMP  Roger, Bill. See you in about 4 minutes, then.
02 17 35 42  CC  Roger. Four or 5 minutes; that is correct.
02 17 35 43  CMP  Okay.

CANARY (REV 42)

02 17 40 55  CC  Apollo 7, Houston.
02 17 41 00  CMP  Houston, Apollo 7.
02 17 41 02  CC  Roger. I have the flight plan update.
02 17 41 19  CMP  Let's proceed with the update, Bill.
02 17 41 21  CC  Roger. At 66 plus 15, delete the radar transponder self-test.
02 17 41 35  CMP  Roger. Understand. Delete the test at 66 plus 15.
02 17 41 39  CC  Roger. At 69 00, add unstow and set up TV camera.
02 17 41 59  CMP  Roger. Set up the TV.
02 17 42 01  CC  Roger. At 69 plus 50, delete the reference to H₂ heaters ON.
02 17 42 16  CMP  Roger. No heaters ON. Understand.
02 17 42 19  CC  Roger. At 70 hours, 70 plus 00, add fuel cell O₂ purge.
Roger. Fuel cell \( \text{O}_2 \) purge at 70 hours.

Roger. And that is 71 plus 41, TV ON.

Roger. You want the TV ON at the same time when we're doing the rendezvous radar test. Is that correct?

No, I think the rendezvous radar test is - stand by one. You're right. Wait just a minute. Let me get this cleared up.

Okay.

Meantime, would you switch omni, please?

Apollo 7, Houston. Would you confirm opposite omni? We are having a little trouble with TM.

Roger. I went from C to A. I'll try Bravo.

Roger. And that is the correct time for TV ON.

Roger. TV ON at 41 plus 41. Is that right?

Affirmative.

That is the end of the flight plan update.

Roger. If you don't want the TV on until 71 hours and 40 minutes, I think we will hold off unstowing it. The thing is in the way when it is up, and we would rather not be running into it all the time.

I didn't hear it.

Understand you want the TV running at the same time we're doing the - or will be doing the radar test.
That's affirmative. That's the confirmation I get here.

Okay.

Apollo 7, Houston. Opposite omni, please.

Roger.

And - Apollo 7, Houston - for your information, I am pretty sure this TV ON time is tied into the Texas acquisition time.

Yes, that figures.

Apollo 7, Houston. Would you confirm or report the position of your PMP power switch?

Stand by.

PMP is in NORMAL; it's UP.

NORMAL.

Would you go to AUX, please?

Roger.

Apollo 7, Houston. One minute LOS Canary; Carnarvon at 18.

Roger.

CARNARVON (REV 42)

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Roger. Houston, Apollo 7. Go.

Roger. Acquisition Carnarvon, and I'd like for you to check a couple of things for us,
please. S-band normal mode PCM switch to PCM, and the power amplifier barber pole.

02 18 19 50 CMP Roger. Now am in barber pole and the PCM switch is in PCM.

02 18 19 59 CC Thank you.

02 18 21 46 CC Apollo 7, Houston. One minute LOS Carnarvon. Request S-band volume up for Honeysuckle at 25.

02 18 21 57 CMP Roger.

HONEYSUCKLE (REV 42)

02 18 27 08 CC Apollo 7, Houston. Acquisition Honeysuckle.

REDSTONE (REV 42)

02 18 46 33 CC Apollo 7, Houston. Acquisition Redstone.

02 18 46 39 CMP Roger. Houston.

02 18 50 05 CC Apollo 7, Houston.

02 18 50 11 CMP 7. Go.

02 18 50 12 CC Roger. Have you made any change in the COMM system, particularly TM settings?

02 18 50 25 CMP I took the recorder for about 30 seconds to record water intake. Haven't monkeyed with the TM settings.

02 18 50 37 CC Okay.

02 18 51 17 CMP Bill, have you all got command of the tape ...

02 18 51 23 CC Have we got what?

02 18 51 25 CMP Roger. I put the tape and ran for 30 seconds to record something and then left it off so it wouldn't continue to run.
02 18 51 35  CC  No. I don't think that did any harm.
02 18 51 39  CMP  Are you receiving things on the tape dump.
02 18 51 43  CC  Did you go to up-telemetry COMMAND RESET?
02 18 51 56  CC  Apollo 7, Houston. Did you go to up-telemetry
                  COMMAND RESET?
02 18 52 21  CC  Apollo 7, Houston.
02 18 52 56  CC  Apollo 7, Houston. If you read, go to S-band
                  OFF to tape.
02 18 53 23  CC  Apollo 7, Houston. About 30 seconds to LOS;
                  Antigua at 03.

ANTIGUA through BERMUDA (REV 43)

02 19 04 29  CC  Apollo 7, Houston.
02 19 04 33  CMP  Houston, 7.
02 19 04 35  CC  Roger. Acquisition Antigua.
02 19 04 38  CMP  Roger.
02 19 04 40  CC  I would like to get a confirmation on something.
                  Did you go to COMMAND RESET when you used the
                  tape?
02 19 04 48  CMP  That's affirmative.
02 19 04 51  CC  Roger. Ground advises do not use DSE as
                  voice log. We have lost TM subcarrier, and
                  we can't get data while you are dumping.
02 19 05 09  CC  We're working on it; we're trying to fix it.
02 19 05 14  CMP  Roger. Say again.
02 19 05 19  CC  We're working a lost TM subcarrier problem.
02 19 05 26  CMP  Roger.
Also, we would like S-band off AUX to TAPE.

Roger. It's in TAPE.

Thank you.

Apollo 7, Houston.

Houston, Apollo 7.

Roger. Apollo 7, Houston. We would like for you to stay in the present COMM configuration until further advised. We are having some difficulties on that TM.

Roger. Understand.

Canary (REV 43)

Apollo 7, Houston. Acquisition Canary.

Roger. Houston.

And let's see, we'll be at Carnarvon about 50. I will have a state vector for you then.

Roger. Understand.

Apollo 7, Houston. Opposite omni.

Roger. Stand by.

Roger.

Apollo 7, Houston. One minute LOS Canary; Carnarvon at 50. Would like POO at Carnarvon acquisition.

Roger. We'll have it.

Thank you.

Carnarvon (REV 43)

Apollo 7, Houston.

Go ahead, Houston.
02 19 50 50  CC  Roger. Confirm PO0 and ACCEPT.
02 19 50 54  CMP  Roger. I'm in PO0. I'll go to ACCEPT. I
would like for you to take a look at this pro-
gram alarm 1105 that we have been getting off
and on through the flight. I got it again here
about 5 minutes ago.
02 19 51 07  CC  Roger. That would've been about 26.
02 19 51 17  CMP  I'm in ACCEPT now.
02 19 51 18  CC  Roger.
02 19 51 26  CC  Have a NAV check to go with the CSM NAV vector
that it is coming up, if you can get ready to
copy that. And I also have an update for the
rendezvous radar tests.
02 19 51 41  CMP  Roger.
02 19 51 52  CMP  Go ahead with your NAV check.
02 19 51 54  JC  Roger. NAV check: 071 11 0000 minus 2914
plus 14170 1593.
02 19 52 30  CMP  Roger. 071 11 0000 minus 2914 plus 14170 1593.
02 19 52 41  CC  Readback is correct. When you are ready, I can
give you the rendezvous radar test update.
02 19 52 53  CMP  Go ahead with that update.
02 19 52 58  CC  Roger. Starting with T align 70 plus 58 159
degrees, 055 017 71 plus 39 71 plus 43.
02 19 53 25  CMP  Roger. Understand. 70 plus 58 159 055 017 71
plus 39 71 plus 43.
Readback is correct. Donn, I have an analysis to this AC problem. I'll go over it and see what you have - what your comments are.

Okay. Go ahead.

Okay. Point 1, we have spent considerable time going through the data here. And we have noticed that the AC bus glitches are associated with the cycling OFF of O_2 CRYO fans. This is causing the AC bus to surge to overvoltage. It seems as though this is only a problem at low power loads on the AC bus, but it has been noticed repeatedly.

Okay. That sounds pretty logical.

Point 2; recommendation O_2 fans tank 1 OFF, do that. This will insure AC 1 stays on line. If our analysis of the problem is correct.

Roger. What about AC 2. We have that one, also.

Roger. You'll have that one ON. We will periodically switch O_2 fans tank 1 back to the ON position. At the same time, O_2 fans tank 2, OFF. This will insure at least one AC bus is protected at all times from this surging to overvoltage.

Roger. I see. If we get fired up again, do you think we will still have this problem?

I'm not sure. It seems as though it is not nearly as much a problem when you're powered
up, it is only when you're in a low power condition. The voltage control is more sensitive or tends to overshoot or something there.

02 19 56 14 CMP
Okay. I'll turn tank 1 off for now.
02 19 56 17 CC
Roger. Understand.
02 19 56 26 CMP
We're probably going to get some stratification when we've proved out on this stratification test.
02 19 56 33 CC
Roger. We have taken that into consideration.
02 19 56 37 CMP
Okay.
02 19 56 44 CC
Apollo 7, Houston. Opposite omni.
02 19 56 48 CMP
Roger.
02 19 57 35 CC
Apollo 7, Houston. We are having a little trouble getting the CSM HAV vector up. If we don't do it, I'll read it up to you over Honeysuckle, that'll be about 67 plus 59 and will require S-bend volume up.
02 19 57 53 CSM
Roger.
02 19 59 25 CC
Apollo 7, Houston.
02 19 59 28 CSM
Go ahead, Houston.
02 19 59 32 CC
Roger. I'm going to have to read you the P27 update if you have the PAD out there.
HONEYSUCKLE (REV 43)
02 20 00 33 CC
Apollo 7, Houston. Do you read?
02 20 01 22 CC
Apollo 7, Houston.
02 20 01 40 CC
Apollo 7, Houston. We will not have to give you a P27 update. We were able to uplink it.
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02 20 02 08  CC  Apollo 7, Houston. Do you read?

02 20 03 36  CC  Apollo 7, Houston.

TEXAS through BERMUDA (REV 43)

02 20 35 09  CC  Apollo 7, Houston through Texas.

02 20 35 13  CMP  Roger. Houston, Apollo 7.

02 20 35 16  CC  Roger. Good morning.

02 20 35 18  CMP  And how are you, sir?

02 20 35 20  CC  Very good.

02 20 35 22  CMP  Oh, very well.

02 20 36 21  CC  Apollo 7, Houston.

02 20 36 23  CMP  Go.

02 20 36 24  CC  Donn, I've got your block data number 8 for

you. Also, could you switch the BIOMED switch
to CDR, and could you confirm that you have

turned the CRYO fans tank 1 OFF?

02 20 36 42  CMP  Roger. CRYO fan tank 1 is OFF, and Wally's

still asleep, but he doesn't have his BIOMED

hooked up.

02 20 36 51  CC  Okay. Copy that.

02 20 36 53  CMP  Will get it on him when they get up.

02 20 36 55  CC  Okay. Real fine.

TEXAS through BERMUDA (REV 44)

02 20 37 02  CMP  You can go with your block update.

02 20 37 04  CC  Okay. This is block data number 8: 045 dash

1 Alfa plus 311 minus 0638 069 plus 57 plus 34

4259, 046 dash 1 Alfa plus 313 minus 0638 071
I'm going to have to ask you to run those by again a little slower, and it might do to stop now and then so I can butt in and tell you if I'm missing any.

Okay, Donn, I guess I'm a little faster than you are this morning. Okay. Did you get where do you want me to start? At the beginning?

Yes, I think you might as well.

Okay. Going back. 045 dash 1 Alfa plus 311 minus 0638 069 plus 57 plus 34 4259, 046 dash 1 Alfa plus 311 minus 0638 071 plus 33 plus 18 4405, 047 dash 1 Alfa plus 272 minus 0649 073 plus 08 plus 47 4593, 048 dash 4 Alfa plus 297 minus 1650 075 plus 52 plus 37 4202, 049 dash 4 Bravo plus 318 minus 1650 077 plus 28 plus 29 4321, 050 dash 3 Alfa plus 265 plus 1371 078 plus 47 plus 51 4161.

Okay. Readback follows: 045 dash 1 Alfa plus 311 minus 0638 069 57 34 4259, 046 1 Alfa plus 311 minus 0638 071 33 18 4405, 047 1 Alfa plus
272 minus 06 49 073 08 47 4593, 048 dash 4 Alfa plus 297 minus 1650 0755237 4202, 049 dash 0 Bravo plus 318 minus 1650 077 28 29 4321, 050 dash 3 Alfa plus 265 plus 1371 076 47 51 4161.

02 20 43 36 CC Roger.
02 20 43 47 CC Donn, could you read the latitude in 046 dash 1 Alfa.

02 20 43 54 CMP Roger. I've got plus 311.
02 20 43 57 CC Should be plus 313.
02 20 43 59 CMP Roger. 313. Thank you.
02 20 44 02 CC Okay. That's got it.
02 20 45 13 CMP Jack?
02 20 45 18 CMP Houston, Apollo 7.
02 20 45 20 CC Apollo 7, Houston. Go ahead.
02 20 45 22 CMP Roger. Just checked PPO₂ and got 235 millimeters.

02 20 45 29 CC I didn't copy that, Donn. Say again.
02 20 45 31 CMP Okay. Partial pressure O₂ on the cabin is 235 mm.
02 20 45 36 CC Roger. Copied that, and Donn, we're through at the computer now. You can go to BLOCK on your UP-TEL switch. Also, you have a GO for 62 dash 1.

02 20 45 47 CMP Roger. Understand. GO for 62 dash 1.

CANARY (REV 44)

02 20 50 47 CC Apollo 7, Houston through the Canaries. Standing by.
Roger. We are powering up the SCS for the G&W at this time.

Roger. Copy.

Houston, Apollo 7.

Go ahead, 7.

Roger. We took frames 44 through 47 on magazine 0 Oscar at 68 hours and 54 minutes. This was a picture of the weather formations around the Canaries.

Okay. Roger. Copy that, and Donn, when you get a chance, we would like you to switch your flow proportioning valve to one then back to AUTO again.

Okay. Done.

Thank you.

Apollo 7, Houston. You're about 30 seconds LOS Canary. You sure look good going over the hill. We'll pick you up at Carnarvon in about 28 minutes.

CARNARVON (REV 44)

Apollo 7, Houston through Carnarvon.

Roger, Houston. Good morning, Jack.

Good morning, Walt. How are you this morning?

Fine.

We'll be standing by.
Hey, Jack. I have a question on our low quad. We had one quad yesterday that was reading 47 percent. Are we going to want that quad propellant pressure around the 43-percent level, or are we going to switch to secondary propellants open loop at 43? Over.

Okay. Stand by. I'll get G&C on that here.

Apollo 7, Houston.

Go ahead, Houston.

Walt, you are about 25 pounds away from the point at which you should switch, which is about 6 percent; so you are quite a ways away, so there is no need to hurry on that now, and we'll give you, when you start getting close, a gage reading of which you should switch.

Roger. And will we switch quad by quad?

Affirmative. Quad by quad.

Okay. We need a map update, please.

Say again. Oh, a map update? Stand by.

Apollo 7, Houston. We'll be talking to you. We'll pick up Honeysuckle in about 4 minutes. We'd like you to turn up your S-band.

Roger.

And I have your map update, Walt.

Go.
02 21 29 53 CC This is for REV 43. The GET of the node is at 68 plus 29 plus 00. Longitude of the node, 122.7 degrees west, a right ascension of 05 plus 33.

02 21 30 14 IMP Roger.

02 21 32 41 CC I just -

02 21 35 52 CC Apollo 7, Houston through Honeysuckle.

02 21 36 07 CC Apollo 7, Houston through Honeysuckle.

02 21 36 12 IMP Roger. This is Apollo 7. Can you read?

02 21 36 15 CC I read you five-by now. We need to switch the BIOMED switch to CDR.

02 21 36 22 IMP Roger. Won't do any good; he's not plugged up.

02 21 36 25 CC Okay. When he gets plugged up, would you do it?

02 21 36 32 IMP Okay. I get a high-pitched squeal on S-band.

How about you?

02 21 36 38 CC Roger. Walt, we've commanded backup voice there because we've lost the FM, and we're going on FM now. We got the voice on the FM subcarrier.

02 21 36 50 CMP Okay. What's the status on our tape recorder?

02 21 36 54 CC Stand by.

02 21 37 53 CC Apollo 7, Houston.

02 21 38 09 CC Apollo 7, Houston.

02 21 38 11 IMP Go ahead, Houston.

02 21 38 12 CC Roger. Walt, when you want to use the tape recorder, go to low bit rate and RECORD. When you
are ready - when you are through recording and want us to dump it, let us know, and we will interrupt real-time data and dump it.

02 21 38 32 LMP Is this a change for our normal operating procedures for the flight?

02 21 38 43 LMP I am not reading you any more.

02 21 38 45 CC Okay. Walt, what we have lost is the FM downlink. We are on the FM downlink now, which means we are time-sharing DSE with real-time downlink.

02 21 39 01 LMP Roger. Have we lost that permanently?

02 21 39 06 CC It hasn't been determined yet. We are going to do a little bit of checking here.

02 21 39 13 LMP Okay. Well, I'll take the tape recorder back and - on 69 hours and 39 minutes.

02 21 39 21 CC Okay.

02 21 39 24 LMP You are going to still keep the bookkeeping on it?

02 21 39 27 CC Okay.

02 21 41 57 CC Apollo 7, Houston. LOS Honeysuckle; pick you up at Guaymas.

GUAYMAS through ANTIGUA (REV 44)

02 22 05 04 CC Apollo 7, Houston through Guaymas.

02 22 05 28 LMP Apollo 7. Reading five-by-five.

02 22 05 30 CC Roger. Five-by. Walt, we want to delete these COMM tests that we were going to do over this stateside pass here or over Canaries.
02 22 05 42  LMP  Roger. Understand.
02 22 06 07  LMP  Houston, Apollo 7.
02 22 06 23  LMP  Hello, Houston, Apollo 7.
02 22 06 25  CC  Go ahead, 7.
02 22 06 27  CDR  Roger. We have a computer problem. We are unable to get a MARK in ...
02 22 06 43  CDR  And as a result of this, we are not aligned at this point and possibly will not be able to support the WSMR test.
02 22 06 55  CC  If I copy you, Wally, understand you have had a problem in aligning the platform, and you may not be able to support the WSMR test. Is that Charlie?
02 22 07 04  CDR  That is Charlie. The problem apparently is the MARK button.
02 22 07 10  CC  A problem with the MARK button. Roger. Understand.
02 22 07 14  CDR  Yes, we hope that's what it is, Jack. It was attempted in the PS1, and in step 4, we have a flashing 51 and calling for a MARK. We pushed the MARK button repeatedly, and it will not go on to the next display. Apparently, it's not accepting the MARK, or else the MARK button is filled; I'm not sure which. I did check – I did check a bit in Flagwood 74, the L53 flag, and that was set when the 51 was flashing. I also did a CNC self-check that turned out okay; and we did a halting 53 – by that I mean we
just ran through the program without actually maneuvering. It seemed to work fine. We did
punch the ENTER button, and the computer progressed through the program.

02 22 08 00  CC  Okay. Roger, Apollo 7. Looks like we're reading
your DSKY now. You're still on Program 41 with
MOUND 701?

02 22 08 09  LMP  Negative. We've got POO in there right now.
Do you want me to call it back up?

02 22 08 12  CC  Okay. Yes, I guess we missed a lockon data.

02 22 08 17  LMP  Okay.

02 22 08 46  LMP  Houston, Apollo 7. On our pre-mod processor
here, we had a failed normal pre-mod processor ...

02 22 09 01  CC  Roger. Understand. Copy that you had a failed
pre-mod processor, and you're going to run the
rest of the flight in AUXILIARY.

02 22 09 09  LMP  That's negative! We are operating in AUXILIARY
now per your request during the evening; and
I'm trying to find out - are we going to have to
operate there the rest of the flight?

02 22 09 22  CC  Wait, we're working on a troubleshooting pro-
cedure on this. I'm sorry I missed part of
your transmission.

02 22 09 32  CC  We'll be troubleshooting this, and we will get
you a reading on it shortly.
Hey, Jack. When I got up this morning, we had already been told by ground to go to MP AUXILIARY earlier in the evening, and I'm wondering is there trouble with the NORMAL; and if not, we'd like to get back so we can operate the tape recorder the way we started.

Just a minute, Walt.

Apollo 7, Houston.

Go, Houston.

Roger. Walt, we had a problem last night with the NORMAL FM where we lost voice telemetry subcarrier of the NORMAL FM, and we're devising a troubleshooting procedure now. We'd like for you to stay in this present configuration until we've gotten that procedure up to you. You can use the tape recorder as you want as long as you are in low bit rate.

GUAYMAS through ANTIGUA (REV 45)

Okay. I picked up the tape recorder when it was already played out. I rewound it; it's standing by for a dump now in case he has something on it. Do you want a dump?

Walt, did you have very much of a voice transcription on that tape recorder?

I don't know, but the whole tape has been recorded so it's going to take you about 8 minutes for a complete dump.
02 22 13 05  CC  Okay. Stand by.
02 22 14 27  CC  Apollo 7, Houston.
02 22 14 30  SC  Roger. Go.
02 22 14 31  CC  On the tape recorder, there's nothing there
that we feel we'd like to dump it for, unless
you have made some voice transmissions in there
that we don't know about.
02 22 14 46  SC  The only thing we might lose that I can think
of would be some of the film log, and I think
we can cover that another way.
02 22 14 54  CC  Okay. We won't dump it then.
02 22 14 58  SC  Okay. We'll go ahead and only data run when we
want to record something. That way we will
limit the amount of time required for dumping.
00 22 15 06  CC  Roger.
02 22 17 43  CC  Apollo 7, Houston.
02 22 18 01  CC  Apollo 7, Houston.
02 22 18 16  CC  Apollo 7, Houston.
02 22 19 04  CC  Apollo 7, Houston.
02 22 20 34  CC  Apollo 7, Houston.
02 22 20 43  CC  Apollo 7, Houston.
02 22 21 06  CC  Apollo 7, Houston.
02 22 25 27  CC  Apollo 7, Houston.
02 22 25 32  CMP  Roger. Houston, Apollo 7. How do you read?
    Over.
02 22 25 34  CC  I read five-by. We've got a few things to try,
Donn, to check the MARK button.
Roger. Say again, Jack?

02 22 25 46 CC We have something we would like you to do to verify the operation of the MARK button. While in program 00, we would like to have you press the MARK button and verify whether you get a PROGRAM ALARM.

02 22 26 04 CMP Okay. Here goes. I do not get a PROGRAM ALARM.

02 22 26 11 CC Okay. If you don't get a PROGRAM ALARM now, press the MARK REJECT button while in PO0 there and see whether you get a PROGRAM ALARM.

02 22 26 21 CMP Roger. Pressing MARK REJECT, I get no PROGRAM ALARM.

02 22 26 24 CC Roger. Copy that. During this next night pass, we would like you to try P51 again. If you don't get any response from the MARK button, then try P53 and P54.

02 22 26 50 CDR Jack, do you have any ...

02 22 27 00 CC Roger. Copy. Stand by.

02 22 27 02 CDR Roger. We used quite a bit of fuel on 53. We'd like to have an update on our fuel status. This is the reason I'm concerned about it, and I sure do ... TV ... problem.

02 22 27 30 CC Okay. Wally, stand by. We are going to discuss that here.

02 22 27 35 CDR Okay. Realize that if we do 53 ... and use the COAS for burns.

02 22 27 40 CC Roger. We understand.
02 22 27 42  CDR  Pretty busy getting set up here. Guess you want to watch our close up ... on the TV.
02 22 27 50  CC  Okay. We will discuss that, Wally. We will be back to you. In the meantime, Walt, we would like to have you read off the positions of your S-band NORMAL and S-band AUX switches here so we could start the troubleshooting procedure on this PM.
02 22 28 08  LMF  S-band NORMAL switches are in VOICE, PCM, and RANGING; S-band AUX is still in TAPE; and I guess I may as well turn the tape switch off. I still have power switches SCE NORMAL, IMP on OFF. Over.
02 22 28 28  CC  Roger. We copy.
02 22 28 33  CC  What are the position of your transponders, Walt?
02 22 28 36  LMF  I'm in SECONDARY of the transponder and the power amplifier in HIGH.
02 22 28 42  CC  Okay. Copy. We'll be back --
02 22 28 46  LMF  Hey, Jack --
02 22 28 47  CC  Go ahead.
02 22 28 48  LMF  ... tape now; why don't I turn the ... tape switch off.
02 22 28 59  CC  We'd rather have you just leave it on, Walt.
02 22 29 02  LMF  Okay.

02 22 30 27  CC  Hello, Apollo 7, Houston.
Roger, Houston. Go.

Okay. If we can't get through the PS1 and 52 using the MARK button, go ahead and use the COAS and get 53 and 54 for the IMU alignment.

Roger. Tom, my concern is, are you willing to expend the service module RCS fuel for the radar transponder test, or are you asking me to be willing to?

Well, the whole thing, Wally - we want to get the platform aligned first and see what we've got. We'll talk about the rest of it down the line over Carnarvon.

I think we've got a problem, and I go along with getting the IMU alignment, too.

We'll try the COAS one time. It's worth it one time in case that we can't get the optics going.

Okay.

All right.

Will you give us a total number of pounds of RCS propellants remaining? I can put it in my ...

Yes. Okay, Walt. We're going to give you this over Carnarvon.

Standing by.

Roger.
Apollo 7, Houston. Your total usable RCS fuel now is 750 pounds.

That is 750 pounds; goes on my chart at 70 hours into the flight. I want total number of fuel because I think, on my chart here, the unusable is already taken off the bottom.

Okay. The 750 is usable.

Well, would you take a look at your copy of my onboard chart and give me a number that I can stick on that?

Okay. Walt, we'll pass that over to you over Tananarive. We're about to lose you here.

Tananarive at 13 minutes.

Okay. Thank you.

TANANARIVE (REV 45)

Apollo 7, Houston.

Go ahead, Houston.

Roger. Walt, the reading that you should be having on your chart for RCS fuel is 808 pounds.

Roger. 808, 58 plus the 750 you gave me.

Roger.

Apollo 7, Houston.

Go ahead, Tom.

Okay. I want to check how this alignment is going out. We've already worked out with Steve Cops here a real slick little way of doing 53
02 22 47 54  CDR  Okay. Do you want to go through and read that one again?

02 22 47 57  CC  We've got 4 minutes. Do you want me to read it over?

02 22 48 07  CDR  Do you read, Tom?

02 22 48 12  CC  Apollo 7, say again.

02 22 48 15  CMP  Yes. Tom, will you go through that again a little bit slower? I was a little bit behind in copying down the procedures. I'm ready to go again.

02 22 48 22  CC  Okay. We go through step 1 and step 2 of P53, and you can use the course align option if you want to, but we acquire the stars within the telescope.

02 22 48 38  CMP  Roger.

02 22 48 39  CC  Okay. Once we get the NAV star in the telescope, then go ahead and get it into the sextant.

02 22 48 45  CMP  Okay. I see, then we ...

02 22 48 48  CC  Okay. When you get it into the sextant, then you can hit VERB 16 NOUN 91 to read the shaft and trunnion of that star.

02 22 48 58  CMP  Roger.

02 22 48 59  CC  Okay. With that value, you go back in step 3 - you see flashing VERB 06 NOUN 92? - you can enter NOUN 92, which is the value you have read out.

02 22 49 09  CMP  Roger.
Then proceed.

Okay.

Then you can use the ENTER button for your MARK.

CARNARVON (REV A5)

Apollo 7, Houston.

Go ahead, Houston.

Roger, Apollo 7. How is the alignment coming?

We are still star reading right now.

Okay. Understand you are still in Program 53.

We are just trying to acquire a star at this point, Tom.

Okay.

Apollo 7, Houston. I'll go ahead and brief you on what we've got planned.

Wait. Let's wait, Tom, until we get done with this alignment.

Yes, yes, okay. I'll just stand by here.

Okay. I would like to get this other one started.

All right.

Houston, Apollo 7.

Go ahead, Wally.

Okay. Donn is busy right now. You got a message for him, or could I take it?

That was too fast. Say again.

Donn is in the MARK routine right now. Is the message for him, or could I take it?
No, it's for the whole crew, and the main thing is to get the platform aligned. And, Wally, if you would turn up the S-band at T1 08 45, we will talk to you through Honeysuckle.

Very good. We did need the arm to curve on this TV camera; we will try to get it up for you.

Okay. We want to see how the platform alignment comes out, and we will talk to you over Honeysuckle.

Okay. I'm not going to rush into anything else but that.

Okay.

Apollo 7, Houston.

Roger. Loud and clear.

Okay. Right now, when Donn is reading the NOUN 91, is he reading - is he going to monitor real time with VERB 16 or VERB 06?

I am using 16, Tom, and I am hitting a NOUN to freeze it when I get right on.

Okay. That sounds good, Donn. Sounds real good.

HONEYSUCKLE (REV 45)

Apollo 7, this is Houston through Honeysuckle. How do you read?
02 23 09 53 CC Apollo 7, this is Houston through Honeysuckle.
02 23 10 18 CC Hello, Apollo 7, this is Houston through Honeysuckle. How do you read, Wally?
02 23 10 45 CC Hello, Apollo 7, this is Houston. How do you read?
02 23 11 00 CC Hello, Apollo 7, Houston. Over.
02 23 13 43 CC Apollo 7, this is Houston standing by through Honeysuckle.
02 23 15 17 CC Apollo 7, this is Houston. How do you read?

HUNTSVILLE through BERMUDA (REV 45)
02 23 34 09 CC Hello, Apollo 7, this is Houston through the Huntsville.
02 23 34 30 CC Hello, Apollo 7, this is Houston through the Huntsville.
02 23 34 51 CC Hello, Apollo 7. This is Houston.
02 23 34 57 CT Huntsville AOS.
02 23 35 03 SC Standing by.
02 23 35 04 CC Hello, Apollo 7, Houston. How do you read?
02 23 35 20 SC ...
02 23 35 39 CDR This is Apollo 7. Do you read? Over.
02 23 35 41 CC Roger. Now reading you about three-by.

How did the alignment go?
02 23 36 19 SC Two-way lock.
Hello, Apollo 7, this is Houston. How do you read? Over.

We are aligned at this time so I'm getting you in the blind.

Roger. Understand you are aligned.

Apollo 7, this is Houston through the Huntsville. We'll be picking you up over California, Guaymas shortly.

Roger. You are coming in very weak. We are aligned. I am aligning the GDC at this time.

Roger. Good show. Understand you are aligning the GDC.

Roger. Let's give it a go.

Roger.

Hello, Houston, Apollo 7. How do you read now?

Apollo 7, this is Houston. Loud and clear. How's that for you?

Roger. You're coming in loud and clear, Wally. Sounds like that alignment technique worked out pretty good, right?

I'm just picking up my ORDEAL right now.
02 23 39 01  CC  Good show.
02 23 39 02  CDR  Star angle difference is about .18 degrees.
02 23 39 05  CC  That's not bad.
02 23 39 07  LMP  Tom, we went ahead and did a PS4 alignment to
the align time that you gave us to ... of 70
hours and 58 minutes.
02 23 39 15  CC  Okay. That's what we wanted.
02 23 39 17  LMP  Okay.
02 23 39 18  CDR  Okay. We'll try to ... attitude ...
02 23 39 24  CC  Roger. What we want you to do for the WSNR
pass - and this will be over on Walt's side -
we want the DSE recorded in low bit rate for
the test. We want the DSE to start at 71 plus
39 plus 00. We want the DSE to stop at 71 46
plus 00.
02 23 39 50  LMP  Roger. We got it.
02 23 39 52  CC  Okay. Now after we finish WSNR, when we come
up for the TV pass for - Walt, make sure that
the tape position is OFF. Over.
02 23 40 05  LMP  Roger.
02 23 40 06  CC  Okay.
02 23 40 08  LMP  Tape OFF now.
02 23 40 21  CC  Okay. Walt, again, the tape should stop the
DSE, and the tape OFF at 71 plus 46.
02 23 40 26  LMP  The tape is stopped now, and the DSE is running,
and I can keep the DSE running. Can I keep the
DSE running with the TV on?
02 23 40 40 CC Yes, you sure can, Walt. No problem.
02 23 40 44 LMP Roger.
02 23 41 19 CC Apollo 7, Houston. Looks like we have a real pretty day down here.
02 23 41 23 CDR Roger. That's the way it looks from here.
02 23 42 06 LMP Houston, Apollo 7.
02 23 42 08 CC Go ahead.
02 23 42 09 LMP Roger. At what time do you want the TV turned on?
02 23 42 12 CC Say again.
02 23 42 14 LMP At what time do you want the TV turned on?
02 23 42 16 CC Stand by. Roger. We are ready for TV now.
02 23 42 35 LMP Turn it on.
02 23 42 36 CC TV going on. Let us know when you are receiving a picture.
02 23 42 42 CC Okay. It goes through a scan converter. We're looking at it now.
02 23 42 47 LMP Can you read it?
02 23 42 48 CC Well, we're looking - down here. Just stand by and keep panning.
02 23 42 53 LMP Roger.
02 23 43 32 CMP Hey, Tom, would you repeat the time for DSE STOP? I was down below when you gave it last time.
02 23 43 38 CC Say again.
02 23 43 41 CMP Repeat the time for DSE STOP.
02 23 43 44  CC  DS£ at 71 plus 46 plus 00.
02 23 43 48  CMP  Roger.  46.
02 23 43 51  CC  Apollo 7, Houston. Verify you're on omni Alfa.
02 23 43 56  LMP  Verified.
02 23 43 58  CC  Roger. Looks like the signal strength is a little low down here.

HUNTSVILLE through BERMINDA (REV 46)

02 23 44 03  LMP  I'm reading 1 volt is all, and we did not get a full 20 minutes to warm up on that thing.
02 23 44 15  CC  Okay.
02 23 44 18  CC  Hey, we got you. I can see Eisele talking there. Hey, Donn, turn your head to the right. There you go. Hey, we're picking up - I can read it; just a minute. It says, "From that lovely Apollo," something - you guys should write - "High stop." something. It looks good; I can see Wally handle it now, and Donn has a smile on his face, and there's Walt. The definition is pretty good down here; I can see the center hatch. Actually I am amazed; it looks real good. Hey, Donn, how about saying something since you're panned.
02 23 45 08  CMP  Say again.
02 23 45 09  CC  Hey, I can read you and can see you loud and clear. It really looks good. I am amazed.
It's coming in heads down. You want us to point —

Lean back a little bit; you are too close to the camera. There you are. We'll have Cecil B. DeStafford down here directing.

Roger.

You forgot to shave this morning, Rislele.

Lost my razor.

Some of the reproductions here are real good.

I can look out through Wally's rendezvous window. I can see the COAS up there, the ORB RATE ball.

We're looking right down the Gulf Coast.

Okay. What's the next one? Little closer, Wally.

It says, "Keep those cards and letters coming in, Folks." It's loud and clear.

Yes, sir, there's plenty show for the whole family. Would you like to get a look out the window with the TV camera? I can give you New Orleans right here.

Okay. Let's take a look and see how New Orleans is this morning.

Roger. Coming up over the Mississippi River. I'm giving you an out-the-window picture. You should see Lake Pontchartrain coming into view now.
02 23 46 50 CC  Okay. We're looking.
02 23 46 58 CDR  We're changing lenses. That's a pretty wide
                 Lake Pontchartrain he gave you.
02 23 47 02 CC  Okay.
02 23 47 06 LMP  There you go.
02 23 47 07 CC  Roger. You got the telephoto on there?
02 23 47 12 CDR  We are just crossing about now over Mobile Bay.
02 23 47 16 CC  Okay.
02 23 47 17 CDR  Should get it about now.
02 23 47 18 CC  Okay. We're starting to get it. Looks like
                 there's a few clouds down there. Yes, we can
                 see it. Is that the coastline you're panning
                 right now?
02 23 47 33 CDR  Going over Mobile now, and quickly, and we'll
                 be coming across Pensacola shortly.
02 23 47 38 CC  Okay. Wally, can you focus one spot for a min-
                 ute? We can see the orbital rate coming in real
                 fast. There you go. Try to hold it on one
                 spot. Now you can see the coastline.
02 23 47 58 CDR  There's a paper mill north of Pensacola that I'll
                 train on.
02 23 48 02 CC  Okay.
02 23 48 04 CDR  We had a beautiful day; you're right. Should
                 give you a good shot of the Cape today.
02 23 48 07 CC  All right. Yes, there's the coastline; it's
                 coming in good.
02 23 48 14  CDR  Roger.
02 23 48 15  CC  Real good.
02 23 48 19  CDR  You might get a kick out of the fact the constellation we used for alignment was ...
02 23 48 24  CC  All right.
02 23 48 33  CDR  ... we used for alignment.
02 23 48 36  CC  Okay. Are you passing over Florida now?
02 23 48 38  CDR  Affirmative.
02 23 48 39  CC  Okay. If you can just hold it. The big thing on that long lens is just to hold it still for one spot and then move to another, it looks like. You can sure see orbital motion.
02 23 49 03  CDR  Tom, we used ... for alignment if you haven't figured it out yet.
02 23 49 08  CC  You're coming in garbled, Wally, so I couldn't hear you.
02 23 49 11  CDR  Guess what constellation we used for the alignment?
02 23 49 19  CC  Okay. Stand by. We'll get it.
02 23 49 21  CDR  Negative. It was Orion.
02 23 49 23  CC  Oh, I thought you said Urian.
02 23 49 25  CDR  You're right.
02 23 49 37  CDR  We're switching lenses again, Tom.
02 23 49 40  CC  Okay.
02 23 49 46  CC  Okay. It looks like we lost TV, and we've done some spade work down here. Looks like we found out what's wrong with the MARK button.
02 23 49 54  CDR  Very good.
02 23 49 55  CC  Okay. It looks like there is an improper exit from a program yesterday, and if the IMU's aligned, we'll select program 20. If you got a piece of paper, we'll copy it down.
02 23 50 06  CDR  Okay. I'm checking the fuel right now so I'll know how much that cost us. Okay. Ready to copy.
02 23 50 12  CC  Okay. Go ahead and select program 20. You'll then do VERB 57 ENTER. After that, you will key ENTER, and then you will select program 00.
02 23 50 42  CDR  Now what that does is cause a reset of flag word 2 bit 14 which is SET, which has prevented that MARK from getting in.
02 23 50 48  CC  You broke up after key ENTER, Tom. We have program 20, VERB 57 ENTER, then key in ENTER, then program something.
02 23 51 31  CC  Then select POO, p-zero-zero.
02 23 51 32  CDR  Hello, Apollo 7, Houston.
02 23 51 35  CC  Go ahead, Tom.
02 23 51 38  CDR  Roger. Did you get that procedure okay?
02 23 51 45  CC  We copied. It was program 20, VERB 57 ENTER, key in ENTER, then back to POO. That I picked up.
02 23 51 45  CC  Roger. That should reset that flag word, and you should be all set to use program 51 and 52 as normal.
And again, I can't tell you how good the TV picture looked down here inside the spacecraft. Just beautiful.

Roger. We estimate two cards for later.

Okay. One thing we'd like to talk to you about now is how we are going to change the flight plan a little bit.

Go ahead.

Okay. Because of that AC glitch last night and the present status of the RCS fuel, we're going to move the third SPS burn up to today. And we're going to plan to make that burn about 75 hours and 48 minutes, so we have about 4 hours to go in which that will bring the perigee on down to 90 miles, and then we'll be way inside the red-line.

Roger. I think that last pass for our last alignment problem is an example of why I didn't want to eat up our fuel earlier ... of the rather obscure DPO's. The land we saw was an example of why I didn't want to eat up our fuel earlier ... rather obscure DPO's.

Okay.

This is still the first flight.

Roger.
02 23 53 14  LMP  Tom, when you pass up the total RCS propellant remaining, I would like to get a readout for each quad, also.

02 23 53 29  CC  Apollo 7, Houston.

02 23 53 31  LMP  Go ahead.

02 23 53 32  CC  Okay. What we'll plan to do is put you the NAV load for this maneuver up over the Canaries, and we'll be passing over that in about another 4 to 5 minutes.

02 23 53 46  CDR  Roger. Standing by.

02 23 53 49  CC  So if you get a chance, go ahead and select program 00.

02 23 53 54  CDR  We have already tried to work that. It didn't work so we'll go back into P7.

02 23 53 58  CC  Okay.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 00 00 40</td>
<td>CC</td>
<td>Apollo 7, Houston through Canary.</td>
</tr>
<tr>
<td>03 00 00 44</td>
<td>CDR</td>
<td>Roger. Go.</td>
</tr>
<tr>
<td>03 00 00 47</td>
<td>CC</td>
<td>Roger. I read you five-by.</td>
</tr>
<tr>
<td>03 00 00 51</td>
<td>LMP</td>
<td>Jack, would you say again the burn time for burn 37?</td>
</tr>
<tr>
<td>03 00 00 54</td>
<td>CC</td>
<td>Roger. 75 k. We're going to be sending you up some NAV loads, and I'll be passing you up a maneuver PAD here.</td>
</tr>
<tr>
<td>03 00 01 04</td>
<td>LMP</td>
<td>Fine.</td>
</tr>
<tr>
<td>03 00 01 14</td>
<td>CC</td>
<td>Apollo 7, Houston. If you will go to ACCEPT, we'll send you up a NAV load.</td>
</tr>
<tr>
<td>03 00 01 20</td>
<td>LMP</td>
<td>Roger. ACCEPT.</td>
</tr>
<tr>
<td>03 00 01 21</td>
<td>CC</td>
<td>Okay. Walt, you might let me know when you're ready to copy your maneuver PAD.</td>
</tr>
<tr>
<td>03 00 01 26</td>
<td>LMP</td>
<td>Copy.</td>
</tr>
<tr>
<td>03 00 01 28</td>
<td>CC</td>
<td>Roger. SPS 3, 075 k 5860 minus 00550 plus 02000 plus 00410 1601 plus 0903 02007 30584 minus 086 minus 046 0 plus 0930 3484 323 075 05 all balls plus 1330 minus 05642 1256 000 000 and 000. Remarks: SCS control 20 seconds two-jet ullage using quads B and D. You will be out of plane to the south, slightly retrograde, slightly pitch down; the sextant star will not be visible after 075 plus 35 plus 00.</td>
</tr>
</tbody>
</table>
Roger. I'll hit the remarks first. We won't be doing a two-Jet ullage on SCS burn, Jack, and burn 3, 075 47 5860 minus 00550 plus 02000 plus 00410 1601 plus 0603 02007 30584 minus 086 minus 046 009 30 3484 323 075 05 0000 plus 1330 minus 05642 1256; all balls on the roll, pitch, and yaw. It's SCS burns for 20 seconds, and you called two-Jet ullage. That's a negative on the two-Jet ullage. Out-of-plane south slightly retrograde and sextant star before 75 hours 35 minutes.

Roger. The reason we are doing a two-Jet ullage, Walt, is to even up the RCS fuel. When we do this, all the quads will be even, and we will be in fat shape for an SCS RCS deorbit redline.

You said a two-Jet RCS, Jack, using two quads.

We can't do it.

Jack, the only two-Jet ullage we're going to do is on a Q&W burn.

Roger. We'll come back with you over that, over Tananarive. And we have the loads in, verified; the computer is yours.

Houston, Apollo 7. We have a NAY check ...

Roger. Say again.

TANANARIVE (REV 46)

Apollo 7, Houston through Tananarive.
03 00 19 32 CDR Roger, Houston. Read you loud and clear.

03 00 19 34 CC You're five-by. On the - on this two-jet ullage: Wally, we felt that we could do a two-jet RCS ullage, RCS ullage, and save about 8 pounds of RCS fuel. You can do this by having the pitch and yaw channel switches at A and pulling pitch main A circuit breaker. How do you feel about that?

03 00 20 04 CDR We've got to fly attitude ... energy, Jack, and that 20 seconds that will give you a pretty tight burn.

03 00 20 10 CC You will still have two-jet ullage attitude hold.

03 00 20 18 CDR The main thing is I don't think a G&H burn will conserve fuel anyway.

03 00 20 22 CC Okay. If you are uncomfortable about it, we will go with the four jets. We just thought we could save you about 8 pounds of fuel.

03 00 21 29 CDR Okay. We will go four jets.

03 00 20 31 CC Okay. Understand.

03 00 20 43 CC Apollo 7, Houston.

03 00 20 45 CDR Go ahead.

03 00 20 46 CC Okay. Wally, on this AC glitch, what they are doing is - we have a series of tests being run off line first, but we're using 106 at the factory to check out all the AC systems in the sensing systems. At the Beach, they are testing
the whole lashup, the CRYO stands, heaters, and everything; and we should have some data on this by tomorrow.

03 00 21 10 CDR Okay. Tom, I think you should realize that all that trouble of going to the hybrid gears is that kind of glitch coming along.

03 00 21 16 CC That's right, and that is why we just decided to go ahead and do this burn 3 and get the perigee down.

03 00 21 24 CDR Okay. We will be doing two jet here; we will have to kick it over for a while.

03 00 21 28 CC Okay. Then we have got plenty of time to pick it up later. No problem on that.

03 00 21 32 CDR Okay.

03 00 21 34 CC And they don't plan - they are not suggesting running any test on board up there, what with the AC power. We will do it all on the ground and tell you what we find out.

03 00 21 42 CDR Okay. We are knocking off all the fuels since we want to stay out of gimbal lock.

03 00 21 47 CC Say again.

03 00 21 49 CDR We are knocking off all fuels except for one in gimbal lock.

03 00 21 54 CC Okay. What we are going to do is delete for the present all flight plan items after 72 hours to prepare for this burn.
03 00 22 06 CDR Concur.
03 00 26 31 CC Apollo 7, Houston. One minute to LOS Tananarive;
we will pick up ARIA 2 in about 2 minutes and
then on through to Carnarvon.

CARNARVON (REV 46)
03 00 35 28 CC Apollo 7, Houston through Carnarvon.
03 00 35 31 CDR Roger. You are loud and clear, Jack.
03 00 35 32 CC You are loud and clear, Wally. We have a pro-
cedure for troubleshooting that loss of the
voice and telemetry subcarrier that we had.
Are you ready to go?
03 00 35 45 CDR I'll take it down.
03 00 35 47 CC Okay. We are just going to walk you through it.
Walt, we would like you to switch the S-band
transponder switch to PRIMARY, pausing in OFF
as you go through from SECONDARY to OFF to
PRIMARY.
03 00 36 01 CDR Jack, I'll slide over to the right seat, and I
will follow you up again.
03 00 36 05 CC Okay. We would like to switch the primary
S-band transponder switch into OFF, pausing a
bit, and then to PRIMARY.
03 00 36 22 CDR S-band --
03 00 36 24 CC S-band transponder.
03 00 36 29 CDR Okay. Going into PRIMARY, then OFF, then back
to PRIMARY.
03 00 36 39 CC Okay. We got it.
03 00 36 44 CDR Is that it?
03 00 36 45 CC Okay. Now we are going to wait a bit and look
at some data here.
03 00 36 50 CDR Roger. Do I have time to blow my nose?
03 00 36 57 CC Go ahead.
03 00 38 10 CDR Houston, Apollo 7.
03 00 38 11 CC Go ahead.
03 00 38 13 CDR Roger. Do you have a click, click, click in
your receiver?
03 00 38 17 CC Negative. Negative, Wally.
03 00 38 24 CDR Okay. Confirm that the digital pilot goes
click, click, click, click, click.
03 00 38 29 CC Roger. Stand by.
03 00 38 36 CDR Whatever that was, it stopped it.
03 00 38 38 CC Roger.
03 00 38 40 CDR It must have been something wrong with
Carnarvon's receiver - transmitter.
03 00 38 46 CDR Keep checking on it.
03 00 38 47 CC Roger.
03 00 38 50 CDR Okay. Jack, I think Carnarvon probably had to
switch transmitters down there ... .
03 00 39 05 CC Okay. Stand by, Wally.
03 00 39 08 CDR Roger.
03 00 39 16 CDR Carnarvon, this is Wally Schirra. Nice to pass
overhead again and good luck ...
<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 00 41 34</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>03 00 41 36</td>
<td>CDR</td>
<td>Go, Jack.</td>
</tr>
<tr>
<td>03 00 41 37</td>
<td>CC</td>
<td>Roger. On the results of this transponder shift that we've gone through: we've got our voice and telemetry subcarrier back. We are GO on the primary transponder. The problem was in the secondary transponder so we are GO the way we are.</td>
</tr>
<tr>
<td>02 00 41 55</td>
<td>CDR</td>
<td>Very good. I'll leave it this way.</td>
</tr>
<tr>
<td>03 00 42 07</td>
<td>CC</td>
<td>Wally, do you still have the clicking in the receiver?</td>
</tr>
<tr>
<td>03 00 42 10</td>
<td>CDR</td>
<td>That is why I was complimenting Carnarvon. They got on it right away and clicked it off.</td>
</tr>
<tr>
<td>03 00 42 14</td>
<td>CC</td>
<td>Okay. Real fine.</td>
</tr>
<tr>
<td>03 00 42 20</td>
<td>CDR</td>
<td>They were paying attention to us and did a very good job.</td>
</tr>
<tr>
<td>03 00 42 23</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 00 42 48</td>
<td>CDR</td>
<td>Jack, I would say the team worked harder today than they did yesterday.</td>
</tr>
<tr>
<td>03 00 42 53</td>
<td>CC</td>
<td>Say again, Wally.</td>
</tr>
<tr>
<td>03 00 42 55</td>
<td>CDR</td>
<td>I say the team worked harder today than they did yesterday.</td>
</tr>
<tr>
<td>03 00 42 58</td>
<td>CC</td>
<td>You bet your life.</td>
</tr>
<tr>
<td>03 00 43 01</td>
<td>CDR</td>
<td>Good show.</td>
</tr>
<tr>
<td>03 00 43 41</td>
<td>CC</td>
<td>Apollo 7, Houston. You want to turn up your S-band volume? We are just about to lose you over Carnarvon here.</td>
</tr>
</tbody>
</table>
Roger.

And, 7, looks like that right now we observe the primary evaporator to have dried out again.

It figures. A direct hit.

Apollo 7, Houston. We're 1 minute LOS Honeysuckle; Hawaii in 15 minutes.

Apollo 7, Houston through Hawaii.

Houston, Apollo 7.

Roger. Five-by.

Aloha. We would like to ask you whether you were able to accomplish the switching ...

Jack, I have the tape recorder being rewound now. I'll give you a call when we're through rewinding; we'll be ready for dump. We did a P52 alignment in the last night pass; used Diphda and Aldebaran and got five balls, and the star angle difference should be on the tape.

Roger. Copy.

I mean the torquing angle should be on the tape.

Okay. Copy that. Walt, we would like to ask you whether you were able to accomplish the switching operation.

Do you read, Jack?

Apollo 7, do you read? Houston.
03 01 02 41 CC Apollo 7, do you read? Houston.
03 01 02 50 CC Apollo 7, Houston.
03 01 03 05 CC Hello, Apollo 7, Houston.
03 01 03 15 CC Apollo 7, do you read? Houston.
03 01 04 37 CC Apollo 7, how do you read? Houston.
03 01 05 21 CC Apollo 7, Houston.
03 01 06 12 CC Apollo 7, Houston.
03 01 06 15 CDR Go ahead.
03 01 06 17 CC Roger. Walt, we copied your transmission on
P52. We would like to know whether you were able to accomplish the switching operation for
the WSR rendezvous radar test during the TV operation.

03 01 06 32 LMP I had the heater on for only about 2 minutes.
We had not counted on performing that, and the whole sequence idea was a bit too rushed. We probably should not even attempted it, Jack.
However, we did turn the heater on for a couple of minutes, turned it to POWER; we read out the test meter readouts, and I don't know if we passed them down, but we got them logged on board here. The lockon - the signal strength never came up above about 1.4 volts, I think it was.

03 01 07 03 CC Okay. We copy that.
03 01 07 08 CDR Did you have any results from WSR?
03 01 07 11 CC Negative. There is no results from WSMR.
03 01 07 13 CDR Okay. And since we're up pretty well on fuel now, we'd like to try again on the second call-out.
03 01 07 20 CC Wally, it looks like we're gonna have a chance about - we may have a chance about 30 minutes after the burn to get - to try again over WSMR.
03 01 07 32 CDR Okay. And that might be pretty good. We'll have a burning attitude and can psych out on that one.
03 01 07 37 CC Right.
03 01 07 38 CDR We'll stay in burn attitude and listen to S-band.
03 01 07 40 CC Okay.
03 01 07 49 CC Okay. Wally, I wanted to ask you a question. Did you have a problem with your BIOMED harness one time?
03 01 07 57 CDR Yes, I did. Aren't you reading me now?
03 01 08 01 CC We're reading.
03 01 08 02 CDR You're reading center now, aren't you?
03 01 08 04 CC Yes, we're reading center now. You want to go to LMP?
03 01 08 09 CDR Okay. We have switched to LMP. You want LMP; center is LMP.
03 01 08 15 CC Okay. Real fine.
03 01 08 17 CDR Just to give you a cable connection: the CDR is in the right seat, LMP is in the center seat, and CMP is in the left seat.

03 01 08 38 CDR That is per flight plan burn 3.

03 01 08 39 CC Roger. We copy that.

03 01 08 40 CDR Roger.

03 01 08 41 LMP Jack, do you have enough time this pass for me to start a tape dump? It's rewound.

03 01 08 48 CC Negative, Walt. We'll hit you over the States for the tape dump.

03 01 08 54 CDR Okay. Are you people in a position to command those tape dumps?

03 01 08 57 CC Affirmative.

HUNTSVILLE (REV 46)

03 01 09 33 CT Huntsville AOS. A two-way lock.

03 01 10 52 CT Huntsville LOS.

03 01 11 20 CT Huntsville AOS, and downlink signal is very weak. Downlink signal very weak.

GOLDSTONE through BERMUDA (REV 46)

03 01 12 57 CC Apollo 7, Houston.

03 01 13 00 CDR Roger. Houston.

03 01 13 02 CC Roger. Wally, at your leisure, we'd like to get some command module RCS temperature readouts.

03 01 13 11 CDR Okay. Stand by. We'll be coming ...

03 01 13 15 CC Roger.
Roger. Jack, 5C reads 5 volts full scale. SD is 5 volts full scale. 6A is 4.9. 6B is 5.0. 6C is 4.8. 6D is 4.9 volts.

Real fine. We have some - due to this transponder problem, we'd like to reconfigure some switches there, and then we will be back in the normal configuration for our COMM switches. Could we get you to put your power PMP switch to NORMAL?

PMP is set.

Okay. Okay. Your forward rewind switch to FORWARD.

Forward rewind switch to FORWARD.

Your record play switch to RECORD.

RECORD.

Your telemetry input switch to LOW.

It's there; verifying.

Okay. Real fine. We're now back in normal configuration.

Okay. You asked about my BIOMED. I checked, and the lead was apart again.

Okay. Real fine.

It's too short. They've must have changed the thing since I tried it last. It was all right during flight preparations.
Hey, Jack, I still have the tape switch OFF.
Do you want the tape switch ON?
Okay. We want the switches just like you've got them.
Okay. The tape is OFF, and the tape is rewound.
No motion. Standing by for your dump. Could you summarize what you found wrong with the COMM system? Also, we should tell you that we could not get the glycol evaporator back on the line.
Roger. We copy that.
Okay. Apollo 7, did you try and reservice the primary evaporator?
That's affirm.
Roger.
Apollo 7, Houston.
Apollo 7, Houston.
Apollo 7, Houston.
Go ahead.
Roger. To summarize our findings on the COMM system: we have found that the secondary transponder has failed. We have normal operation on the primary transponder, and except for the secondary problem, our COMM system is operating normally.
Roger.
Apollo 7, Houston.
Go ahead.

Wally, on that BIOMED harness - that problem that you reported. Do you think you'll have time to do any repair work on it?

Afraid not.

The next time you are reading me, if you aren't getting it, ask and I can plug it back in. It seems to pull out when we exercise or during a sleep period.

Okay. We copy.

It's no problem to hook it up.

One of the sensors is leaking. You better leave it out or pull it off.

Canary LOS.

Houston, this is CDR. Let me give you a check on this. I got a light; check my lead. Houston, did you receive?

Stand by, Wally.

Apollo 7, Houston. We're reading LMP data in the center seat.

Roger. We switched it over, and now it's over in the right seat.

Okay. We copy the switch.

Okay. We're getting good data.

We're getting that radio station interference again.

Okay.
03 01 22 30 CC Apollo 7, opposite omni.
03 01 24 16 LMP Our magazine, O for Oboe.
03 01 24 21 CC Roger. Copy.
03 01 24 22 LMP Five, six, seven, and eight. Starting with Crestview - Pensacola area, Tallahassee, Jacksonville, St. John's river outlet to the Atlantic.
03 01 24 39 CC Okay. We copy magazine Oboe six, seven, and eight.
03 01 24 43 LMP Roger. That was five, six, seven, and eight.
03 01 24 45 CC Copy.
03 01 24 47 CMP Roger. Five, six, seven, and eight.
03 01 24 50 CMP Hey, Jack, we need a map update.
03 01 24 54 CC Okay. Coming up.
03 01 24 55 CMP Thank you.
03 01 25 10 CDR By the way, these five windows, almost every darn one of them is looking at something.
03 01 25 20 CC I didn't copy that, Wally. Could you say again?
03 01 25 21 CDR Roger. These five windows have a view almost all the time, except the center hatch window is useless for anything now.
03 01 25 30 CC Roger. Copy.
03 01 25 35 CDR That would be a beautiful window to have working.
03 01 25 40 CC Roger. We agree.
03 01 25 54 CC Okay. Apollo 7, I have your map update.
03 01 25 57  CDR  Roger. Go ahead.
03 01 25 59  CC  Okay. For REV 46, the GET of the node is 72
plus 57 plus 26. Longitude 178.7 degrees east,
right ascension 05 plus 28.
03 01 26 18  CDR  Thank you.
03 01 27 04  CDR  Jack, on frames 58 and 59, Bermuda.
03 01 27 17  CC  Say again, Apollo 7.
03 01 27 20  CDR  Frames 58 and 59 magazine Oboe, we're on
Bermuda loud and clear.
03 01 27 26  CC  Roger.
03 01 27 27  CDR  Complete stratus just north of us for an awful
long distance.
03 01 27 35  CDR  The Western Atlantic is pretty well clouded over.
03 01 27 38  CC  Okay. We copy that.
03 01 27 42  CDR  I would say about 40 miles east of Bermuda,
there's a long frontal line. It's running on
a line about north and south. The tops are
rather difficult to estimate. That's about all
I can see at this time.
03 01 27 55  CC  Okay. Copy.
03 01 29 24  CC  Apollo 7, Houston. We're 1 minute LOS Bermuda;
Antiguas not up now, so we'll pick you up over
Ascension in about 10 minutes.
03 01 29 34  CDR  Roger. Thank Bermuda for staying up for us;
will be glad to take their picture. Ready to
take a picture.
Apollo 7, Houston. It appears we got 85 degrees yaw. Do you concur?

ASCENSION (REV 47)

Apollo 7, Houston.

Apollo 7, Houston through Ascension.

Apollo 7, Houston. How do you read?

Houston, read you loud and clear. How we?

You're five-by. We copied coarse align.

Apollo 7. We are realigning.

Okay. You're going to need to do P51 and 52 again. You go through P51 and then P40 and then P52. As a reminder, it will not be necessary to go to P30; however, if you do, you will have to reload the targets.

Did you copy that, 7?

Apollo 7, Houston.

Say again.

Roger. Could you copy my message about the programs?

Say again, Jack.

Okay. You'll go through 51 then 40 and then P52. As a reminder, it won't be necessary to go to program 30; if you do, you will have to reload the target.

Understand.
Okay. Real fine. One question on the primary evaporator: did you - did the steam pressure come up to NORMAL? After the serve - reservice?

Jack, the steam pressure did not move one iota.

Okay. Copy that.

Apollo 7, Houston.

Go ahead, Houston.

Roger. Would you go INCREASE for 45 seconds on your steam pressure control valve switch?

Roger. We'll try it again.

Apollo 7, Houston. Thirty seconds LOS Ascension; we'll pick you up over Tananarive in about 18 minutes. We'd like to watch our reservice over Canavon.

Roger. Understand. No response on EVAP pressure valve.

Roger. We copy that.

TANANARIVE (REV 47)

Apollo 7, Houston through Tananarive.

Apollo 7, Houston through Tananarive.

Apollo 7, Houston through Tananarive.

Apollo 7, Houston through Tananarive.

Okay. Houston, do you read me now?

I read you five-by, Wally.

Roger ...

Roger.
03 02 01 11  CC  Apollo 7, Houston. Forty-five seconds LOS Tanaanarive; we will pick you up over Carnarvon in about 8 minutes.

CARNARVON (REV 47)

03 02 10 02  CDR  Houston, Apollo 7.
03 02 10 05  CC  Apollo 7, read you five-by.
03 02 10 08  CDR  Roger. We just resynchronized our MET of the MFC. It was running 5 seconds slow. The MET of the LEB is right on.
03 02 10 18  CC  Okay. Copy that. And, Wally, we are standing by to watch your primary evaporator reservice, if you're ready for it.
03 02 10 29  CDR  Jack, as you're reading it, the steam pressure has come up.
03 02 10 33  CC  Okay. We copy that now; we see it. The other thing is - the burn 3 flight plan activity - is of the SCS attitude reference check, and the SIA stamping - SCS SIA stamping we would just like to remind you of those.
03 02 10 48  CDR  Roger.
03 02 12 05  CC  Apollo 7, we copied your clock problems. We would like to give you a GET hack at 074 plus 12 plus 30 in about 15 seconds.
03 02 12 17  CDR  Here we've got a 16 65 off the board.
03 02 12 20  CC  Okay.
03 02 12 25  CMP  The water boiler light is on again.
03 02 12 29  CC  Copy. I passed up that check, due to your water boiler comment. I'll give it to you at 074 plus 13 plus 00.

03 02 12 42  CMP  We can take it any time.

03 02 12 43  CDR  13 is good.

03 02 12 51  CDR  Aren't you reading out DSKY?

03 02 12 54  CC  Yes, we have a delay here, Wally. There's - four, three, two, one.

03 02 12 59  CC  MARK.

03 02 13 00  CC  074 plus 13 plus 00. We're reading the DSKY, but we have a delay down here so we're not quite accurate.

03 02 13 09  CDR  After the simulation, we're 7/100 of a second off.

03 02 13 12  CC  Okay. Copy.

03 02 13 15  CDR  Okay. Jack, when you gave yours, I had 59 and 93.

03 02 14 53  CC  Apollo 7, Houston.

03 02 14 55  CDR  Go ahead.

03 02 14 56  CC  Do you have any thoughts on why the evaporator didn't reservice the time before this?

03 02 15 05  CDR  We gave it 5 minutes. This time, we gave it a little bit longer. That may be the variable.

03 02 15 11  CC  Okay. Copy.

03 02 15 14  CDR  If it was ... it happened between this one and the one you did; that may not be the answer.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 02 15 19</td>
<td>CMP</td>
<td>Jack, it came back spontaneously like it did once earlier in the flight.</td>
</tr>
<tr>
<td>03 02 15 26</td>
<td>CMP</td>
<td>...</td>
</tr>
<tr>
<td>03 02 15 29</td>
<td>CC</td>
<td>Roger. We copy that.</td>
</tr>
<tr>
<td>03 02 15 32</td>
<td>CMP</td>
<td>The EVAP pressure valve - or water control valve is frozen closed or something?</td>
</tr>
<tr>
<td>03 02 15 39</td>
<td>CMP</td>
<td>It more or less comes back on its own.</td>
</tr>
<tr>
<td>03 02 15 42</td>
<td>CC</td>
<td>Okay. We copy.</td>
</tr>
<tr>
<td>03 02 15 45</td>
<td>CMP</td>
<td>When I see it coming back, I generally help it along by throwing a little water on it.</td>
</tr>
<tr>
<td>03 02 16 00</td>
<td>CC</td>
<td>Walt, or Wally, do you think it might be a sticky solenoid in the water control valve?</td>
</tr>
<tr>
<td>03 02 16 08</td>
<td>LMP</td>
<td>Could be; it's that kind of a trouble.</td>
</tr>
<tr>
<td>03 02 16 11</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>03 02 17 53</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS Carnarvon; Hawaii in 18 minutes.</td>
</tr>
<tr>
<td>03 02 17 58</td>
<td>CDR</td>
<td>That's what we've got here.</td>
</tr>
<tr>
<td>03 02 18 00</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 02 18 00</td>
<td>LMP</td>
<td>HAWAII (REV 47)</td>
</tr>
<tr>
<td>03 02 18 00</td>
<td>CC</td>
<td>Apollo 7, Houston through Hawaii.</td>
</tr>
<tr>
<td>03 02 18 00</td>
<td>LMP</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>03 02 18 00</td>
<td>CC</td>
<td>You are loud and clear. We would like to pass up this WSMR rendezvous radar test data now - before we get all tied up with burn procedures.</td>
</tr>
<tr>
<td>03 02 18 00</td>
<td>LMP</td>
<td>Okay. We were just thinking about that ourselves. That's pretty close ESP.</td>
</tr>
</tbody>
</table>
03 02 37 44 CC  Okay. Let me know when you are ready to copy.
03 02 37 47 CCR Go ahead.
03 02 37 48 CC  Okay. Your roll attitude will be 349.3, pitch 305.8, yaw 061. Your GET AOS will be 76 plus 23. Estimated GET rendezvous radar lock 76 plus 25. There is a remark: the rendezvous transponder heater ON at 76 plus 00.
03 02 38 38 CDR  Roger. Understand. Attitude 349.3, 305.8, 061.0, AOS at 76 plus 23, lock on at 76 plus 25, heater ON at 76 plus 00.
03 02 38 57 CC  Roger. That yaw attitude would be better at 060.8.
03 02 39 04 CDR  We will get it pretty close to 060, Jack.
03 02 39 06 CC  Okay.
03 02 39 08 CDR  Roger.
03 02 39 12 LMP  Do you people have any druthers for S-band antennas covering this burn?
03 02 39 16 CC  Okay. Stand by. We'll get it to you.
03 02 39 21 CDR  Jack, on this slosh test - that's all the more reason to go to four jets. I want you to read the procedure during the burn.
03 02 39 33 CC  Roger. Wally, we copy.
03 02 39 36 CDR  Okay. I'm going down into attitude now.
03 02 39 58 LMP  Hey, Jack, is the S-IVB still up?
03 02 40 01 CC  Affirmative.
03 02 40 04 LMP  I don't know if we ever reported to you, but Wally and I observed it visually when it was
about 400 miles behind us. What's its relative position now?

03 02 40 14 CC Okay. Stand by. We will give it to you exactly.
03 02 40 20 CDR Within a mile or two would be good enough.
03 02 40 31 CC Apollo 7, the S-IVB appears to be about 700 and some odd miles ahead of you.
03 02 40 45 LMP Roger.

HUNTSVILLE through MILA (REV 47)
03 02 41 16 CT Huntsville AOG.
03 02 44 09 CT Huntsville. Two-way lock, solid range.

HUNTSVILLE through MILA (REV 48)
03 02 52 17 LMP Houston, Apollo 7. Over.
03 02 52 19 CC Go ahead.
03 02 52 21 LMP I think we are passing over Baja California again. I took frames on magazine 0: frames 55 and 56 Hawaiian Islands; 57 and 58 were Baja California, Gulf of California.
03 02 52 51 CC Roger. Copy that, Walt.
03 02 53 28 CC Apollo 7, Houston.
03 02 53 34 LMP Go, Houston.
03 02 53 35 CC Roger. We would like for you to turn your O₂ fan 1 to ON for 3 minutes here.
03 02 53 43 LMP Hey, Jack, every several hours, I've been switching fans like this.
03 02 53 47 CC Okay. Copy that.
03 02 54 01 CC Walt, when was the last time you did it on tank 17
On tank 1 - oh, maybe an hour and a half ago.

Okay. We would like you to do it again here if you would.

Done.

Jack, I gave you the wrong frame numbers a while ago. I just uncovered 65, and it looks like about 58 and 59 with the Hawaiian Islands and 60, 61, 62 coming across the Gulf Coast of Mexico.

Okay. Copy.

Houston, Apollo 7.

Go ahead.

Did you get the fuel usage on that backup alignment technique?

I'll see if I can get some figures on that for you to pass up.

Okay. The fuel we had before we tried the alignment up here ... the fuel we had when we came across the States on the TV pass.

Okay.

Apollo 7, Houston. You can turn O_2 tank 1 fan off.

Tank 1 fan is OFF. Is it your wish, Bill, only to have one running at a time so I never lose two buses, or do you intend to keep them both off and put them on for the ... DSKY once in a while?
Okay. Walt, what we're going to do - that's what we have been doing - is having only one fan on at a time. What we are going to do over Ascension here, we want you to turn the fans in tank 2 off, and then you'll have them both OFF; and after the burn, we'll turn the number 2 fan back on.

Okay. I got both of them OFF now. You want number 2 back ON?

Roger. Turn number 2 on right now; we'll turn it off at Ascension.

Roger. It's on. I just took frames 63 and 64 of magazine 0.

Okay.

APPROVED through BERMUDA (REV 18)

Apollo 7, Houston.

Roger. Go.

Roger. On that question about the RCS fuel usage: for the period across the States and including the backup alignment, we - about all we can accurately predict is about 5 pounds of RCS fuel usage.

You had to predict, Jack? You couldn't measure that, huh? ...

This —
Again, we would like to have an update to our onboard charts now if you have it, and then one after the burn, please.

Okay. Coming up.

Jack, while you're at it, I'd like to have you consider eliminating the chlorination of our water today. It took just about - oh, about 3 ... before it started tasting palatable again.

Okay. Copy.

And we'll put chlorine in tomorrow.

Okay. Stand by.

Apollo 7, are you in AUTO in the primary evaporator steam pressure?

That's affirmative, and I see ... thank you very much.

Okay.

This time I'm not going to try to increase it; I'm going to try to just turn the water on.

Okay, Apollo 7. We don't want you to do that.

Okay.

Must be dried out.

Okay. Stand by one.

Okay. I'm following malfunction procedures again; I'll attempt to increase it.

Okay. We concur on it.

It seems to be coming up.
<table>
<thead>
<tr>
<th>Time</th>
<th>ID</th>
<th>Tag</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 03 05 04</td>
<td>CC</td>
<td></td>
<td>Roger. We copy.</td>
</tr>
<tr>
<td>03 03 05 18</td>
<td>CC</td>
<td></td>
<td>And, Walt, we suggest that you leave the back pressure valve closed until after the burn, and then we'll think it out. We'll have the answer to Wally's chlorination question after the burn, also.</td>
</tr>
<tr>
<td>03 03 05 33</td>
<td>CDR</td>
<td></td>
<td>Last night, we had some pretty bad water; it was pretty disappointing.</td>
</tr>
<tr>
<td>03 03 05 37</td>
<td>CC</td>
<td></td>
<td>Okay. Copy.</td>
</tr>
<tr>
<td>03 03 05 39</td>
<td>IMP</td>
<td></td>
<td>I couldn't eat the last part of my last meal yesterday 'cause I didn't want to put that water in it.</td>
</tr>
<tr>
<td>03 03 05 43</td>
<td>CC</td>
<td></td>
<td>Roger.</td>
</tr>
<tr>
<td>03 03 05 46</td>
<td>CDR</td>
<td></td>
<td>A lift-off agreement was that if it tasted bad, we'd stop; we're just proposing to knock off 1 day.</td>
</tr>
<tr>
<td>03 03 05 53</td>
<td>CC</td>
<td></td>
<td>Okay. We copy.</td>
</tr>
<tr>
<td>03 03 05 55</td>
<td>CDR</td>
<td></td>
<td>Roger.</td>
</tr>
<tr>
<td>03 03 06 14</td>
<td>IMP</td>
<td></td>
<td>Houston, I've been able to get this up to a normal range so I suspect that with a little manipulation of the water flow, I can get this ... boiler operating again. That's the way I did it once before.</td>
</tr>
<tr>
<td>03 03 06 25</td>
<td>CC</td>
<td></td>
<td>Roger. Copy. And, Walt, the figure to update your onboard RCS chart is 800 pounds, 800.</td>
</tr>
</tbody>
</table>
03 03 06 33  LMP  Understand.  800 now and will be standing by for one after the burn. And what does quad C have now?

03 03 06 42  CC  Stand by.

03 03 07 04  CC  We will pick you up over Ascension in about 6 minutes, Walt.

03 03 07 17  LMP  Roger.

ASCENSION (REV B8)

03 03 13 40  CC  Hello, Apollo 7, Houston.

03 03 13 52  CC  Hello, Apollo 7, Houston.

03 03 14 04  CC  Hello, Apollo 7, Houston.

03 03 15 06  CC  Hello, Apollo 7, Houston.

03 03 15 09  CDR  Roger. Loud and clear.

03 03 15 10  CC  Roger. You're now coming in loud and clear. I'll again remind you on the star check that the sextant stars are not visible after 75 plus 35.

03 03 15 24  CDR  Roger. We're set up now.

03 03 15 27  CC  And I just wanted to recheck on what the stars look like, and also, Jack will talk to you now on the CRYO's.

03 03 15 36  LMP  Okay. We think we had a star check in daylight, but we're not sure.

03 03 15 40  CC  Okay.

03 03 15 41  LMP  The approximate attitude and - I looked for the star, and it came in with AUTO optics.

I'm pretty sure it was lined up, and I'm
<table>
<thead>
<tr>
<th>Time</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 03 15 52</td>
<td>CC</td>
</tr>
<tr>
<td>03 03 15 57</td>
<td>CC</td>
</tr>
<tr>
<td>03 03 15 58</td>
<td>SC</td>
</tr>
<tr>
<td>03 03 16 04</td>
<td>CC</td>
</tr>
<tr>
<td>03 03 16 26</td>
<td>LMF</td>
</tr>
<tr>
<td>03 03 16 31</td>
<td>CC</td>
</tr>
<tr>
<td>03 03 16 34</td>
<td>LMF</td>
</tr>
<tr>
<td>03 03 20 31</td>
<td>CC</td>
</tr>
<tr>
<td>03 03 20 37</td>
<td>CDR</td>
</tr>
<tr>
<td>03 03 31 13</td>
<td>CC</td>
</tr>
<tr>
<td>03 03 31 17</td>
<td>CDR</td>
</tr>
<tr>
<td>03 03 35 40</td>
<td>CC</td>
</tr>
<tr>
<td>03 03 45 02</td>
<td>CC</td>
</tr>
<tr>
<td>03 03 45 05</td>
<td>CDR</td>
</tr>
<tr>
<td>03 03 45 07</td>
<td>CC</td>
</tr>
</tbody>
</table>
03 03 45 10  CDR  Roger. Standing by.
03 03 45 47  CDR  The FDAI still five five.
03 03 45 50  CC  Okay. Ten seconds to time back. Six, five, four, three, two, one.
03 03 45 59  CC  MARK.
03 03 46 01  CC  T minus 2 minutes.
03 03 46 03  CDR  Speed NORMAL.
03 03 46 04  CMP  Key controllers ON.
03 03 46 07  CDR  One is ON.
03 03 46 09  CDR  Heat controller ON.
03 03 46 10  CMP  Limit cycle OFF.
03 03 46 12  CDR  Limit cycle OFF.
03 03 46 14  CMP  Standing by for 30 seconds.
03 03 46 15  CDR  Roger.
03 03 47 01  CDR  One minute.
03 03 47 27  CDR  ...
03 03 47 31  CMP  For ... ullage in 15 seconds.
03 03 47 33  CDR  Roger.
03 03 47 50  CC  Ten, nine, eight, seven, six, five, four, three, two, one, zero.
03 03 48 11  LMP  Beautiful cutoff.
03 03 48 15  CDR  Gimbal: cut it off one, two, three, and four.
03 03 48 34  CDR  Did you pick up that SLA stamping jazz?
03 03 48 38  CC  Roger. Copy.
03 03 48 40  CDR  Solid as a rock. Jack, are you picking up any residuals?
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 03 48 43</td>
<td>CC</td>
<td>Affirmative. We copy.</td>
</tr>
<tr>
<td>03 03 48 46</td>
<td>CDR</td>
<td>T .3 minus 13.3.</td>
</tr>
<tr>
<td>03 03 48 49</td>
<td>CC</td>
<td>Copy the DELTA-V counter.</td>
</tr>
<tr>
<td>03 03 48 53</td>
<td>CDR</td>
<td>Care if I turn my channels off?</td>
</tr>
<tr>
<td>03 03 49 59</td>
<td>CDR</td>
<td>A and B OFF.</td>
</tr>
<tr>
<td>03 03 50 07</td>
<td>CDR</td>
<td>... They're OFF. They're OFF.</td>
</tr>
<tr>
<td>03 03 50 27</td>
<td>CDR</td>
<td>... Stand by.</td>
</tr>
<tr>
<td>03 03 50 32</td>
<td>CDR</td>
<td>Locked and all channels are OFF.</td>
</tr>
<tr>
<td>03 03 50 35</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>03 03 50 38</td>
<td>CDR</td>
<td>That's a surprise every time. That thing really slaps us.</td>
</tr>
<tr>
<td>03 03 50 42</td>
<td>CC</td>
<td>Roger. I bet.</td>
</tr>
<tr>
<td>03 03 50 47</td>
<td>LMP</td>
<td>Jack, on that SLA stamp: we're getting absolutely no firings at all and 4 degree deadband.</td>
</tr>
<tr>
<td>03 03 50 55</td>
<td>CC</td>
<td>That's what we like to hear. That's good news.</td>
</tr>
<tr>
<td>03 03 50 57</td>
<td>CDR</td>
<td>Yes, that saves a lot of fuel.</td>
</tr>
</tbody>
</table>

GUAM (REV 48)

<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 02 57 24</td>
<td>CC</td>
<td>Apollo 7, Houston through Guam.</td>
</tr>
<tr>
<td>03 03 57 26</td>
<td>CDR</td>
<td>Roger. We're standing in attitude now.</td>
</tr>
<tr>
<td>03 03 57 29</td>
<td>CC</td>
<td>Roger. That was a real good burn, Wally. We confirmed your orbit on radar, 90 by 160.</td>
</tr>
<tr>
<td>03 03 57 38</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 03 57 39</td>
<td>CC</td>
<td>And we would like to have you turn your O &lt;sub&gt;2&lt;/sub&gt; fans tank 2 to AUTO.</td>
</tr>
<tr>
<td>03 03 57 48</td>
<td>LMP</td>
<td>Done.</td>
</tr>
<tr>
<td>03 03 57 49</td>
<td>CC</td>
<td>Okay. And O &lt;sub&gt;2&lt;/sub&gt; fans tank 1 to OFF, and remain in this configuration until ground cue.</td>
</tr>
</tbody>
</table>
Roger. Standing by.

Okay. After the WSMR radar test which is coming up, we will be ready to power down and set up housekeeping.

Roger.

Apollo 7, Houston. One minute LOS Guam; we pick you up at Hawaii in about 8 minutes.

Roger. We have our transponder heater on. We are working into attitude.

We couldn't copy that, Wally. Say again.

Roger. We have the transponder heater on; we are working into attitude.

Okay. Real fine. Real fine.

ARIA 3 (REV 48)

ARIA 3, go REMOTE.

Apollo 7, Houston through ARIA 3. Standing by.

HAWAII (REV 48)

Apollo 7, Houston through Hawaii. Standing by.

Roger.

Apollo 7, Houston through Hawaii.

Roger.

You're five-by, Wally. We had a real good look, close look at the SPS data, and it was right down the line. Real good operation.

Roger. Sounds like I got a good engine.

It sure does.
CC Apollo 7, Houston. Opposite omni.

03 04 16 37 CDR Apollo 7, Houston. Roger.

CC Okay. Wally, on your question on the chlorination: you may delete the chlorination for today. We'll ask you for some later data on the taste of your water as we go along.

03 04 16 53 CDR Roger. I gotta agree with you. Very good.

HUNTSVILLE (REV 48)

03 04 17 13 CT Huntsville AOS.

03 04 18 17 CDR Jack.

CC All right. Go ahead, Wally.

03 04 18 20 CC If there's a power down, I'd like to leave one of the blue bags there to check our speedup rate during drifting flight.

03 04 18 34 CDR I'd like to start drifting flight with our rates almost to zero, and then we'll see how they develop.

03 04 18 42 CC Roger. We concur.

03 04 18 44 CDR We heard a report last night that Lunney said it looked like we were very stable, but that turned out not to be true.

03 04 18 56 CC Which one do you plan to leave on, Wally?

03 04 19 13 CDR ... DSKY lifters, we could get a check on this control board, we're another 2 ... deadband rate high, SCS attitude hold.

03 04 19 29 CC Roger. We copy.
03 04 19 31 CDR Roger.
03 04 19 33 CDR ... Got to prepare that square for the GTO.
03 04 22 12 CT ...
03 04 22 32 CT ...

GOLDSTONE through MILA (REV b8)

03 04 25 01 CC Apollo 7, Houston. We should be getting the estimated radar lockon at this time.
03 04 25 08 CDR Roger. We're still reading zero.
03 04 25 13 CC Roger. Still reading zero on the meter.
03 04 25 17 CDR Roger.
03 04 25 18 CDR Tune it just a little bit. It's coming up a little bit now.
03 04 25 30 CC Roger. Understand. The meter is coming up.
03 04 25 31 CDR Roger. Came up about .1. It came up 1 volt.
03 04 25 36 CC Roger. One volt.
03 04 25 37 CDR Good deal, terrific. Then it went down to zero. Yes, 'cause that is about 1.4 volts.
03 04 25 47 CC Roger.
03 04 25 48 CDR It's solid on 1.5. Right at 1.5 volts.
03 04 26 02 CC Roger. Understand. Solid at 1.5.
03 04 26 05 CDR Roger. That's good news. Set on 1.7.
03 04 26 14 CDR Set on 1.7 there.
03 04 26 17 CC Roger.
03 04 26 24 CDR 1.7, almost 1.8.
03 04 26 32 CDR 1.7.
03 04 26 46 CDR It's dropping off now; I think we're making lock.
03 04 26 48  CC  Roger.
03 04 26 50  CDR  She came back up - about 1.6.
03 04 27 22  CDR  We're holding lock about 1.4.
03 04 27 31  CDR  ... decide to use that radar, setup sure a lot better.
03 04 27 36  CC  Okay.  ... now.
03 04 27 40  CDR  Looks like we beat the Gemini VI, Tom.
03 04 27 42  CC  Roger.
03 04 27 52  CDR  Still holding lock 1.5.  That's pretty spectacular.
03 04 27 55  CC  Okay.  1.5.
03 04 27 57  CDR  Just dropped off - and she's zero.  Tom, I'd say it's a good job.  I think it's come to the end of the lock.
03 04 28 07  CC  Okay.  It's back to zero then, Wally?
03 04 28 11  CDR  Affirm.
03 04 28 13  CC  Okay.
03 04 28 14  CDR  Pretty far down the pike by now.
03 04 28 15  CC  Yes, you're gonna be cutting across down around Mexico City shortly.
03 04 28 18  CDR  Si.
03 04 28 24  CC  Okay.  As soon as we find out the data, Wally, we'll call it back to you.
03 04 28 28  CDR  Okay.  I'm sure glad to see you got that one.
03 04 28 31  CC  Roger.
03 04 28 45  CC  Apollo 7, Houston.
Go ahead, Tom.

Roger. White Sands said they got locked on solid, had good data; they had you at 450 miles for 50 seconds.

Magnifico! Give them my compliments. You mean they copied it?

Yes, right - radar sounds pretty good, doesn't it?

Great news.

Good show.

...

Yes.

There's nothing on TV that'll stop me from making the big trip.

(Laughter)

Some kind of small success there.

Yes, the DTO's are looking pretty good.

Roger.

They sure looked good on that SCS burn, too; that looked tight as the dickens.

It looked better to me than the G&W.

Yes.

It was as good, at least.

Roger. We have yaw 70 degrees at this time.

We're going to PAD down shortly so we won't worry about Saturday night ...
03 04 29 50  CC Roger. I'll give your regards to MIT.
03 04 29 53  CDR Say again?
03 04 29 57  CMP We'll drop another gimbal on me ... 
03 04 29 59  LMP Give them mine, too.
03 04 30 01  CC Okay.
03 04 30 13  CDR Tom, we're planning to power down here; does 
that jive with your revised?
03 04 30 16  CC That's right; we're going to power down shortly.
03 04 30 19  CDR Okay. We'll leave the B bag up.
03 04 30 21  CC Okay.

GOLDSTONE through MILA (REV b9)

03 04 34 44  CDR Tom, we'd like to go ahead and power down to G\&N.
03 04 34 47  CC Say again?
03 04 34 49  CDR - power down to G\&N now.
03 04 34 50  CC Okay. We're ready. You can go ahead and power 
it down.

ANTIGUA (REV b9)

03 04 37 47  CC Apollo 7, Houston.
03 04 37 56  CC Apollo 7, Houston.
03 04 38 26  CC Apollo 7, Houston.

ASCENSION (REV b9)

03 04 50 38  CC Apollo 7, Houston through Ascension.
03 04 50 42  SC Roger.
03 04 50 51  CC Apollo 7, Houston. Your waste quantity is 
now about 77 percent, and you have a GO to 
dump at your convenience.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 04 50 03</td>
<td>LMP</td>
<td>Roger. We will probably wait until it's closer to 90, Ron.</td>
</tr>
<tr>
<td>03 04 50 08</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 05 06 05</td>
<td>CC</td>
<td>TANANARIVE (REV 49)</td>
</tr>
<tr>
<td>03 05 06 12</td>
<td>CDR</td>
<td>Apollo 7, Houston. TANANARIVE standing by.</td>
</tr>
<tr>
<td>03 05 06 13</td>
<td>CC</td>
<td>Roger, TANANARIVE.</td>
</tr>
<tr>
<td>03 05 06 24</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 05 06 28</td>
<td>CC</td>
<td>Good afternoon, Ron.</td>
</tr>
<tr>
<td>03 05 06 34</td>
<td>CDR</td>
<td>Yes, watched the tail end of your burn there, it looked real good.</td>
</tr>
<tr>
<td>03 05 10 22</td>
<td>CC</td>
<td>Apollo 7, Houston. About 1 minute LOS; we'll have your block data at Hawaii.</td>
</tr>
<tr>
<td>03 05 32 27</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>03 05 32 32</td>
<td>CDR</td>
<td>Loud and clear, Ron.</td>
</tr>
<tr>
<td>03 05 32 34</td>
<td>CC</td>
<td>Roger. I have your block data in number 9 to give you.</td>
</tr>
<tr>
<td>03 05 32 55</td>
<td>CDR</td>
<td>Ready to copy.</td>
</tr>
<tr>
<td>03 05 32 58</td>
<td>CC</td>
<td>Roger. 051 dash 3 Bravo plus 308 plus 1380 080 plus 22 plus 36 2420, 052 dash 3 Bravo plus 308 plus 1380 082 plus 00 plus 15 3731, 053 dash 3 Alfa plus 266 plus 1370 083 plus 36 plus 27 4280, 054 dash Alfa Charlie minus 069, minus 0150 084 plus 22 plus 07 4800.</td>
</tr>
<tr>
<td>03 05 34 39</td>
<td>CDR</td>
<td>Are you ready for readback?</td>
</tr>
</tbody>
</table>
03 05 34 41 CC Negative. Opposite omni.

03 05 34 53 CC I'll start again with 055 now. 055 dash Alfa Charlie plus 026 minus 0220 085 plus 55 plus 07 3988, 056 dash Alfa Charlie plus 118 minus 0300 087 plus 28 plus 31 3674. Over.

03 05 35 50 CDR Roger. Readback: 051 dash 3 Bravo plus 308 plus 1380 080 plus 23 plus 36 2420, 052 dash 3 Bravo plus 308 plus 1380 082 00 15 3731 053 - 3 Alfa plus 266 plus 1370 083 36 27 4280, 054 Alfa Charlie minus 069 minus 0150 084 22 07 4400, 055 Alfa Charlie plus 026 minus 0220 085 55 07 3988, 056 Alfa Charlie plus 118 minus 0300 087 28 31 3674. Over.

03 05 37 01 CC Apollo 7, Houston. Your readback correct.

03 05 37 09 CDR ... Roger, Ron.

03 05 37 17 CC Apollo 7, Houston. Let's check the one on fifty-first rev. The DELTA-V should be 34 20.

03 05 37 29 CDR On 51 3 Bravo.

03 05 37 35 CC Roger. On area 051 3 Bravo.

03 05 37 41 CDR 342 Bravo, 34 20. Roger.

03 05 37 45 CC Roger. Just about LOC. We would like to start battery B charging over Hawaii after we pick up data.

03 05 37 54 CDR Okay.

HAWAII (REV 49)

03 05 46 44 CC Apollo 7, Houston through Hawaii.
LMP 03 05 46 47  Roger.
CC 03 05 46 49  Roger. We have data; you can commence batt B charge any time.
LMP 03 05 46 56  Roger. Commencing now. Is there anything in particular you're observing there for starting this charge?
CC 03 05 47 11  Okay.
CC 03 05 47 14  Apollo 7, Houston. We just want to look at the voltage and the current. We would also like to get your onboard reading of the current when you start it up.
LMP 03 05 47 26  Roger. It's kind of interesting. The charger is showing DC amps zero.
CC 03 05 47 35  That is interesting.
LMP 03 05 47 36  Not what you expected, is it?
CC 03 05 47 37  Not quite.
LMP 03 05 47 43  Now that I'm on battery B, it's showing 2.2 amps. Do you read ... 2.2 amps?
CC 05 05 48 07  I don't want a keyhole now, Walt. I can't compare it.
LMP 03 05 48 10  Say again.
CC 03 05 48 11  I don't want a keyhole over Hawaii; we can't compare it. We'll pick up data here shortly.
LMP 03 05 48 16  Okay. On 37 volts, 2.25 amps.
CC 03 05 48 20  Roger.
CC 03 05 50 15  Walt, we're showing the 2.18 amps now and 37.4 volts.
HUNTSVILLE through GUAYMAS (REV 49)

03 05 52 06 CT Huntsville, two-wheel log, valid range.
03 05 52 52 CC Apollo 7, Houston.
03 06 00 31 CC Apollo 7, Houston. About 1 minute to LOS.
03 06 00 38 LMF Roger. We ... real production now on interior
photography.
03 06 00 46 CC Roger.
03 06 00 49 LMF We're trying to show just how mobile you can
be inside of this thing.
03 06 00 53 CC Very good. Walt, for your information there,
the cutoff on that charge will be .4 amp or
ampere hours replaced.
03 06 01 09 CC Roger.

TANANARIVE (REV 50)

03 06 01 03 LMF Roger. Understand. Sounds like try to get to
.4.4 amps first, or ... by batt A, right?
03 06 01 09 CC Roger.
03 06 01 09 LMF Roger.
03 06 01 09 CC Roger. Understan... sounds like try to get to
.4.4 amps first, or ... by batt A, right?
03 06 01 09 CC Roger.

MERCURY (REV 50)

03 06 39 13 CC Apollo 7, Houston. Tananarive standing by.
03 06 46 22 CC Apollo 7, Houston. One minute LOS.

03 07 02 24 CC Apollo 7, Houston, Mercury.
03 07 02 31 CDR Houston, Apollo 7. Do you read?
03 07 02 39 CDR Houston, Apollo 7. Over.
03 07 02 42 CC Apollo 7, Houston. Roger. We read you, and we
request your battery charger current.
03 07 02 50 CDR Okay. That can wait. We had a minor problem
when we left you awhile ago. We could hear you
call us over Tananarive, but we couldn't raise you. The SPS burn left a large puddle of water on the aft bulkhead. At first, we were very concerned about whether it was water glycol or water. We tasted it; it was water. We checked further and discovered it was underneath the suit bags. Since that time, we mopped it using the water-hose dump system. The water came from the coolant lines that we used to use and the water coolant lines and its condensation. We took a panel off - the small perforators panel - to determine how to work the problem. Houston, Apollo.

Roger. We copied part of that, I think, Wally. Looks like you've got water on your aft bulkhead, and it came from the water coolant line. I'm not sure of your condition at the present time - if it's still coming in or not. We have it all mopped up. It's condensate water, we're positive. It will probably occur again. We have given a full story on the tape for the dump.

Roger.

...Roger. I understand it's all on the voice tape for the dump, also.
Right. And the battery charge occurred. I'm showing about .6 amps. Looked to me like it jumped up real fast here and then takes a long time on the plateau.

Roger. We concur. We're reading .55 now, Walt.

Okay. I'll have to expect you keep me posted because I never got below .5 last time, and you got down to about .41.

Roger. We understand. We're estimating about 10 hours to get down to .41.

Okay. Why don't you and the rest of the gang have a drink for us to celebrate Donn and my fifth anniversary in the program today.

Hey, great! By golly, will do.

At this rate, I'll be an old man by my second flight.

Walt, we could also use your service module RCS quantity readings, and then we will correct them for you.

Roger. I'll give them to you. We haven't been too concerned with onboard readouts since we're going with your quantities.

Roger.

... reading ... 54. RCS-B is reading — well, the same as it was. RCS-C is reading 60. RCS-D is reading 65. Over.
03 07 06 09  CC  Roger. Say again Charlie.
03 07 06 18  LMP  Roger. Charlie is reading 60.
03 07 06 18  CC  Roger. Fifty-four, nothing or 93, and 60, and 65.
03 07 06 26  LMP  Roger. We have it. I think we'd be interested in your quantities for each of our quads.
03 07 06 34  CC  Roger. We'll work it out and send it back.
03 07 06 37  LMP  And I don't think we ever got a total quantity for our ... I need A numbers to put on my RCS profile as I carry in my checklist.
03 07 06 50  CC  Roger. We're working up on all that, and we've got a status coming up to you. It'll be coming up a little later.
03 07 06 58  LMP  We thank you. And we have our own estimate of the new service module RCS redline. Interesting to see what you guys come up with.
03 07 07 08  CC  Roger. Wally, you might like to know that parts of your BIOMED harness has probably become disconnected again. We don't read the heart rate down there.
03 07 07 22  CDR  Roger.
03 07 21 52  CC  Apollo 7, Houston. Opposite omni.
03 07 22 14  CC  Apollo 7, Houston.
03 07 22 17  LMP  Roger. Opposite omni.
03 07 22 24  CC  Roger. Walt, we'd like to request O_2 tank 1 fans ON for about 5 minutes now, then OFF.
Roger. Tank 1 fans ON.

If you get a chance, look down on the ground there. You might be able to see a big fire.

Where at?

I think you may not see it till the next pass; it's over in Hawaii.

Roger.

You say that big fire is to the west?

Yes. That's affirmative. We'll try to give you some pointing data for the next pass over.

Roger. Thank you.

Huntsville two-way lock. Downlink weak, too weak for valid range.

Huntsville two-way lock; valid range.

Houston, Apollo 7.

Houston. Go.

Roger. We also just discovered water coming out of our blue hoses, at least the one in the center couch. I haven't checked the other two yet, but we've got quite a bit of visible moisture flowing out of it.

Roger. Coming out of the blue O₂ hose. Is that what you said?

Affirmative. And we've temporarily turned off the suit compressor so we could clean up - clean it up.
03 07 29 45  CC  Roger.
03 07 29 55  CDR  The anomaly is going to be a problem here, but I can see the solution to the problem.
03 07 30 07  CC  Roger.
03 07 31 26  CT  Huntsville LOS. TANANARIVE (REV 51)
03 08 14 10  CC  Apollo 7, Houston.
03 08 14 53  CC  Apollo 7, Houston through TANANARIVE.
03 08 15 00  LMP  Roger. We read you five-by, Ron.
03 08 15 03  CC  Roger. We sure could use your battery manifold pressure, systems test 4A.
03 08 15 11  LMP  We read the temperature about a half an hour ago when we used it to dump something, and it reads 1.4 until you open the vent; and when you open the vent, it reads about .5.
03 08 15 22  CC  Roger.
03 08 15 27  LMP  Did you read? Did you read that, Ron?
03 08 15 34  CC  Apollo 7, Houston. Roger. Read 1.4 and 0.5 when you opened the vent.
03 08 15 40  LMP  Roger. And we checked our lithium hydroxide canisters. They are dry. We have checked the suit circuit water ... and it's functioning in AUTO 1 and AUTO 2. It's remaining in AUTO 2.
03 08 15 56  CC  Roger. Have you come to any specific point in the malfunction procedures?
03 08 16 06  LMP  Not yet.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 08 17 18</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>03 08 17 48</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>03 08 17 52</td>
<td>LMF</td>
<td>Go.</td>
</tr>
<tr>
<td>03 08 17 54</td>
<td>CC</td>
<td>Roger. Looks like our battery charging current is decreasing a little faster than predicted, and we would like your onboard reading.</td>
</tr>
<tr>
<td>03 08 18 06</td>
<td>LMF</td>
<td>Roger. I am reading .5 amps.</td>
</tr>
<tr>
<td>03 08 18 10</td>
<td>CC</td>
<td>Roger. .5. We will keep you advised on it.</td>
</tr>
<tr>
<td>03 08 18 28</td>
<td>CC</td>
<td>Walt, that volcano should be about 30 degrees down and 20 degrees left of local vertical at 80 plus 57.</td>
</tr>
<tr>
<td>03 08 18 42</td>
<td>LMF</td>
<td>Eighty plus 57 and 30 degrees down and 20 degrees left.</td>
</tr>
<tr>
<td>03 08 18 46</td>
<td>CC</td>
<td>Roger. ...</td>
</tr>
<tr>
<td>03 08 18 49</td>
<td>LMF</td>
<td>What?</td>
</tr>
<tr>
<td>03 08 18 50</td>
<td>CC</td>
<td>Roger. Thirty degrees left, 20 down, and 30 left. No, belay that. Thirty degrees down and 20 left of local vertical.</td>
</tr>
<tr>
<td>03 08 19 02</td>
<td>LMF</td>
<td>Thirty down and 20 left at 80 hours and 57 minutes.</td>
</tr>
<tr>
<td>03 08 19 06</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>03 08 19 47</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS; Mercury at 35.</td>
</tr>
<tr>
<td>03 08 19 54</td>
<td>LMF</td>
<td>Roger. Mercury 35.</td>
</tr>
<tr>
<td>03 08 36 39</td>
<td>CC</td>
<td>Apollo 7, Houston through Mercury.</td>
</tr>
<tr>
<td>03 08 36 44</td>
<td>LMF</td>
<td>Roger. Loud and clear.</td>
</tr>
</tbody>
</table>
03 08 36 48  CC  Roger. I have flight plan update for you. One line.
03 08 37 04  LMP  Go ahead.
03 08 37 06  CC  Roger. Eighty-two plus 00; fuel cell oxygen purge.
03 08 37 20  CDR  Roger. We read you, Ron.
03 08 37 23  CC  Roger.
03 08 37 27  CDR  ... that volcano, was that at 80 57?  
03 08 37 h2  CC  Roger. Volcano time 80 plus 57.
03 08 37 47  CDR  Roger.
03 08 38 17  CC  Apollo 7, Houston. Based on the trend, it looks like we'll terminate batt B charge, probably over Hawaii.
03 08 38 26  CDR  Roger.
03 08 38 47  CDR  We are still getting water out of our three hoses.
03 08 38 51  CC  Roger. I understand.
03 08 39 04  CC  Wally, is there any way you can maybe give us an estimate of how much water is coming out there?
03 08 39 10  CDR  Ron, the first time we hacked out of there, about a spoonful from the center one, and we were getting about - that's a teaspoonful - we're getting about half of that out of the left one, and just a little moisture out of the right one.
03 08 39 28  CC  Roger. Copy.
03 08 40 09  CC  Apollo 7, Houston. While we're at it, any estimate on the quantity that was on the bulkhead?
03 08 40 16  CDR  About a pint. Quite a large amount.
03 08 40 20  CC  Yes, I'd say so.
03 08 41 54  CC  Apollo 7, Houston. Request BIOMED to position 3.
03 08 42 00  CDR  Roger.
03 08 42 33  CC  Thirty seconds LOS; Hawaii at 53.
03 08 42 43  CDR  Hawaii 53. What islands are we going by?
03 08 42 54  CC  Roger. Be going south of the big islands.
03 08 43 01  CDR  Roger.

HAWAII (RBV 51)

03 08 54 33  CC  Apollo 7, Houston, Hawaii via S-band.
03 08 54 50  CC  Apollo 7, Houston. Hawaii M and O VHF for a bit.
03 08 55 08  CC  Apollo 7, Houston.
03 08 55 10  LMP  Roger.
03 08 55 12  CC  Roger. S-band volume up.
03 08 55 23  LMP  Roger. On S-band.
03 08 55 26  CC  Roger. Hawaii M and O VHF OFF now.
03 08 55 40  CC  We're standing by this pass.
03 08 55 53  CC  Apollo 7, Houston. I recommend terminate battery charging on B.
03 08 56 02  LMP  Roger. Terminate. I'd like to get a report from you on how much we have in B, if you get a chance - and also on A.
03 08 56 11  CC  Wilco.
03 08 56 16  LMP  Roger. Ron, we got a good sweep down the entire chain. The big island itself is pretty well clobered with clouds, and you don't actually see Kilauea.
**Roger.** That's a heck of a note.

It's the clearest we've ever seen it out here over Hawaii, though. We've got very nice pictures of the entire chain. We took some movies, but we don't know how good they are.

**Roger.**

**Apollo 7, Houston.** Thirty seconds LOS; Mercury at 82 plus 10.

**Roger.** Mercury at 82 plus 10.

**Houston, this is Apollo 7.**

**Go.**

**Houston CAP COMM, Apollo 7.**

**Say again.**

**...**

**Go.**

**Apollo 7, Houston. Did you call?**

**Apollo 7, Houston.**

**MERCURY (REV 52)**

**Apollo 7, Houston through Mercury.**

**Roger. Ron, read you loud and clear. How me?**

**Roger.** Loud and clear.

**When we left Hawaii --**

**I ended up with a failed switch in the number 2 handcontroller in pitch down. We discovered it in acceleration command. I will troubleshoot it when we get the computer back on the line after we power up.**
<table>
<thead>
<tr>
<th>Time</th>
<th>Source</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 10 12 07</td>
<td>CC</td>
<td>Roger. A lot of static, Wally; say again.</td>
</tr>
<tr>
<td>03 10 12 11</td>
<td>CDR</td>
<td>Okay. Over Hawaii, just as we went by the big island, the number 2 handcontroller failed in the pitch-down direction in ACCEL COMMAND and pulsed.</td>
</tr>
<tr>
<td>03 10 12 26</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>03 10 12 30</td>
<td>CDR</td>
<td>I only got one pulse in pitch down, but I got continual pitch-down command and ACCEL COMMAND. I'd like to try to troubleshoot that. We'll try it in RATE COMMAND. I will troubleshoot that in the computer bulb when we power up.</td>
</tr>
<tr>
<td>03 10 12 48</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>03 10 12 51</td>
<td>LMP</td>
<td>Say, Ron, do you have time to give us a map update?</td>
</tr>
<tr>
<td>03 10 12 55</td>
<td>CC</td>
<td>Roger. Stand by. I'll get you one.</td>
</tr>
<tr>
<td>03 10 12 58</td>
<td>LMP</td>
<td>Okay. And have the doctors done any talking down there about the possibility of one or all of us having a cold and stopped up ears on reentry?</td>
</tr>
<tr>
<td>03 10 13 12</td>
<td>CC</td>
<td>Roger. They've been thinking about it, and they will advise.</td>
</tr>
<tr>
<td>03 10 13 16</td>
<td>LMP</td>
<td>Okay. We've got something on board here in a medical kit called antibiotic. I was wondering if we ought to be taking it, or what? So far, Wally's, I guess, about holding his own on his ears. Donn may be getting a little bit worse, and I think my ears are still clearing up fairly well.</td>
</tr>
</tbody>
</table>
Roger. I think before antibiotics, they're concerned about temperature. Do you have a temperature? You know, before you go into the antibiotics.

We'll start wearing the oral thermometer a little bit and see where we stand, just for the experience.

Roger.

7, Houston.

Go ahead.

Roger. We'd like you to proceed with the waste water dump.

Roger.

We're reading 80 percent. What do you show?

Roger. We read 82.9.

Roger. We'll dump just after we LOS.

Roger. And any further water problems out of the hoses there, or any results of the humidity survey?

We haven't had any more water coming out the hoses for about the last 40 minutes. The humidity survey indicates that ... water is going to condense out.

Roger.

We'll give you the readings on the last run if we can go ...

Roger. Our last humidity reading. Are you ready to copy?
03 10 15 13 CC Affirmative.
03 10 15 17 LMF At Wally's suit inlet hose, I'll give you wet then dry, 54/66. The inlet to the cabin heat exchanger 58/68. At the condensate pipe, we had a temperature on the pipe of 52. The wet bulb in the area was 58. The dry bulb in the area was 73. Over by the right-hand window, we had a 68/72. Over.

03 10 15 53 CC Roger. We copy.
03 10 16 16 CC 7, I have your map update.
03 10 16 19 CDR Go.
03 10 16 22 CC REV 52, GET node 81 plus 52 plus 02, longitude 42.4 east, right ascension 05 plus 19.

03 10 16 46 CDR Roger.

HAWAII (REV 52)
03 10 30 10 CC Apollo 7, Houston. Hawaii standing by.
03 10 30 18 CDR This is Apollo 7.
03 10 30 24 CC Apollo 7, Houston. You're real weak.
03 10 30 27 CDR Roger. Read you loud and clear.
03 10 30 29 CC Roger.
03 10 30 30 CDR - adjust our sleep cycle here. This 5 and 1/2 hours is not too appealing with burn 3 already out of the way.
03 10 30 42 CC Roger.
03 10 30 43 CDR We would like to add an hour and a half to each of our sleep cycles.
03 10 30 55  CC  Go. May I copy that, Wally?
03 10 30 57  CDR  Okay. That will give us each 7 hours. So we'll
stay on watch for an hour and a half here and
sack it out with Donn tomorrow or later.
03 10 31 06  CC  Okay.
03 10 31 08  CDR  Very good. What we'll do is just add an hour
and a half to each of our sleep schedules.
03 10 31 20  CC  So far it looks good down here.
03 10 31 23  CDR  Roger.

REDSTONE (REV 52)
03 10 42 46  CC  Apollo 7, Houston through Redstone.
03 10 42 50  LMP  Roger, Ron.
03 10 42 52  CC  Roger.
03 10 42 53  LMP  We're standing by for an RCS quantity update.
03 10 42 59  CC  Roger. We had it just about all fixed, and then
you guys used some over Hawaii. We're working
on it.
03 10 43 07  LMP  Sorry about that.
03 10 43 09  CC  Roger.
03 10 47 23  CC  Apollo 7, Houston. Opposite omni.
03 10 48 41  CC  Apollo 7, -
03 10 48 48  LMP  - update tomorrow afternoon sometime.
03 10 48 52  CC  Say again, Walt.
03 10 48 55  LMP  Why don't you see if Jack can pass us up a Lima
Sierra update tomorrow afternoon sometime.
03 10 49 01  CC  Wilco.
03 10 49 07 CDR Ron, it's completely dry underneath the suit bag at this time.

03 10 49 12 CC Roger. That's good to hear that. I was a little curious how it stayed in one place down there.

03 10 49 30 CDR ...

03 10 49 40 CC I missed that. Ascension at 08.

03 10 49 49 CDR ... stuck in there by adhesive.

03 10 49 56 CC Roger. I understand.

03 10 49 58 CDR ... stuck between the two.

ASCENSION (REV 53)

03 11 09 44 CC Apollo 7, Houston through Ascension.

03 11 09 48 CDR Roger. Loud and clear.

03 11 09 50 CC Roger. I have some data for you if you are ready to copy.

03 11 10 03 CDR Go ahead.

03 11 10 05 CC Roger. Your total usable service module RCS fuel is quad A 48 percent, Bravo 57 percent, Charlie 48 percent, and Delta 57 percent.

03 11 10 31 CDR What does that all total up to in pounds, Ron? Do you have that?

03 11 10 34 CC Roger. For your chart update, it's 687 pounds at 83 hours. I have your new redlines if you'd like those also.

03 11 10 48 LMP Forty-eight percent usable - that's a number I have - I'm not sure that is - how much do I have in that quad that's usable?
03 11 11 05  CC  Walt, say again.
03 11 11 07  CDR  ...
03 11 11 12  LMF  We also have to switch at 43 percent, and I don't think it's 43 percent usable. It's 43 percent --
03 11 11 27  CC  Apollo 7, Houston. Are you saying when to switch to secondaries?
03 11 11 32  CDR  Negative.
03 11 11 34  LMF  We switched to secondaries at 43 percent, and I need to know an absolute percent in the quad - not a percent usable - if you have that number.
03 11 11 47  CC  Roger. We'll get it for you.
03 11 11 50  LMF  And the number for the chart you said was 683°?
03 11 11 54  CC  687.
03 11 11 57  LMF  687. Thank you.
03 11 12 05  CC  And I have your battery totals.
03 11 12 10  LMF  Go ahead with the battery.
03 11 12 12  CC  Roger. Batt A 33.2, batt B 30.8, batt C 39.5.
03 11 12 28  LMF  Roger. You're getting low, low there. I hope you are still considering a different chart sometime, around six or so.
03 11 12 39  CC  Roger. Walt, we're still evaluating this. We're working very closely with the manufacturer, and we should have some information probably sometime tomorrow.
03 11 12 51  LMF  Roger. Thank you, Ron.
03 11 12 55  CC  And he advised the voice quality of the DCE is still good.
Roger. Understand. Thank you. Were you giving me usable or a number to go on my chart when you gave me the chart update?

The chart update is what you go on the chart with on the poundage. The percentage was the total usable, as calculated on the ground, not a correction factor for your gages.

Roger. Our chart includes 58 pounds unusable. Do we add that to the number you gave, or did you give us the number for the ordinate there?

The number for the ordinate.

Apollo 7, Houston. We're reading about 84 percent on the waste water to quantity. Just about LOS now.

Roger. We are going to commence dumping in 5 minutes.

Roger. We will pick you up at Mercury at 44.

Say again, Wally.

The last number we had was 808; looks like I missed 20 pounds less than 43.

Roger. I understand.

Apollo 7, Houston through Mercury. Standing by.

Apollo 7, Houston through Mercury. Standing by.

Roger. We read you loud and clear.
03 11 47 30 CC Roger. Same here.

GUM (REV 53)

03 11 54 40 CC Apollo 7, Houston. One minute till LOS; Redstone at 15.

03 11 54 46 LMP Roger. We're just breaking down now, and we'll be changing crews. Wally and I are getting off here.

03 11 54 56 CC Roger.

03 11 54 57 LMP We get off here.

03 11 55 01 CC Say again, Walt.

03 11 55 03 LMP I was just repeating we get off here.

REDSTONE (REV 53)

03 12 16 15 CC Apollo 7, Houston through Redstone.

03 12 17 46 CC Apollo 7, Redstone. Standing by.

03 12 17 53 CMP Roger. Ron.

03 12 17 55 CC Hey, good morning.

03 12 17 57 CMP How are you?

03 12 17 59 CC Getting along great. Yourself?

03 12 18 03 CMP Oh, just fine; I just got up. Had a good night's rest. Wally and Walt are sacking out now.

03 12 18 08 CC Okay. Good.

03 12 19 27 CC Apollo 7, Houston.

03 12 19 30 CMP Go, Ron.

03 12 19 32 CC Roger. We want to cycle the O2 tank 1 fans at this time. Turn them on and -- for 5 minutes and then off.
03 12 19 44  CMP  Roger. I've got 1 ON at the moment; 2 OFF. You want me to turn 2 ON for a bit?
03 12 19 52  CC  Negative. We thought 02 tank 1 fan was OFF. We would like to turn on tank 1 fan at this time.
03 12 20 05  CMP  Okay. Well, they're just the other way around.
03 12 20 10  CC  Okay. Stand by, then.
03 12 20 34  CC  Okay. Donn, let's go ahead and cycle tank 2 fans ON for 5 minutes and then OFF.
03 12 20 41  CMP  Roger. We've got a couple of reports for you.
03 12 20 45  CC  Roger. Go.
03 12 20 46  CMP  Roger. We had canister change number 7, at around 82 30, and we - Wally and Walt - checked the command module RCS temperatures at around 83 hours, and they were all 5 volts. All except 6A, and that was 4.9.
03 12 21 08  CC  Roger. Copy.
03 12 21 23  CMP  Ron, we have a number of 687 pounds RCS. Now is that total, or is that just the usable?
03 12 21 38  CC  Donn, that is usable propellant.
03 12 21 42  CMP  Okay. So I can add - for our chart up here, I can add the 58 pounds that we've got included in it?
03 12 21 55  CC  That's affirmative. You can.
03 12 22 00  CMP  Roger. In the future, when you give us the totals, would you please have the usable added in because that's what we plotting on this little card we've got.
Roger. You want the ordinate when I give you the update. Is that correct?

Roger.

That makes us feel better. We wondered what happened to all the fuel all of a sudden.

Okay.

Donn, I want to make sure you save three of your decongestants for use prior to reentry.

Roger. We got you on that.

Roger.

I've got about 1 minute to LOS, Donn.

Understand.

You might be interested to know that the little TV yesterday morning was much, much better than any ground testing I had ever seen.

Is that right? Boy, that's great! Did you see it on the commercial?

That's affirmative, and it was really great.

Outstanding.

ASCENSION (REV 54)

Apollo 7, Houston. Ascension standing by.

Apollo 7, Houston. Opposite omni.

Roger.

Apollo 7, Houston. One minute LOS; Mercury at 18.
Apollo 7, Houston.

Houston, Apollo 7.

Roger. Apollo 7, Houston. Acquisition Mercury. I would like to brief you on a USB test. It involves a couple of switches.

Okay. Go ahead.

Roger. Just about time LOS Mercury, we would like power TMP to AUX and the S-band volume up for that Guam pass; and this will be at about 25 minutes, 85 hours and 25 minutes.

Okay. Will do. You want power TMP to AUX and S-band volume up?

Right. And if the test doesn't work out, I will try and come back on VHF. Otherwise, at LOS Guam, you can put the power TMP back to NORMAL.

Roger. Understand.

Roger.

Apollo 7, Houston. We would like power TMP to AUX any time now.

Roger.

Houston, Apollo 7.

Go.

Roger. Would you confirm the H₂ fuel cell purge that is in the flight plan?

Stand by.
03 13 22 46  CC  Apollo 7, Houston. Negative. We are updating
that real time. You can disregard that entry.

03 13 22 54  CMP  Roger. That is what I thought; the heaters are
off. I've got a couple of reports I would like
to make.

03 13 23 00  CC  Go.

03 13 23 02  CMP  Okay. When Wally went to sleep, which was about
84 hours, he took two aspirins and 20 clicks of
water; and when I went to sleep about 77 hours,
I took two aspirins and an Actifed and 20 clicks
of water.

03 13 23 22  CC  Roger. Understand. Wally at 84 hours: two
aspirins and 20 clicks. Donn at 77 hours: two
aspirins, one Actifed, and 20 clicks.

03 13 23 31  CMP  That is affirmative.

   GUAM (REV 5

03 13 27 31  CC  Thank you.

03 13 27 32  CC  Apollo 7, Houston. I'll have a block data at
Redstone.

03 13 27 36  CMP  Roger. Understand. Block data at Redstone.

03 13 27 39  CC  Roger.

03 13 29 52  CC  Apollo 7, Houston. One minute LOS Guam; Redstone
at 50.

03 13 29 58  CMP  Roger. Understand.

   REDSTONE (REV 5

03 13 50 13  CC  Apollo 7, Houston.
03 13 50 16  CMP  Houston, Apollo 7. Go.
03 13 50 18  CC  Roger. I have a block data when you are ready to copy.
03 13 51 22  CMP  Go ahead, Bill.
03 13 51 23  CC  Roger. Before I start, we would like to confirm the TMP power back to NORMAL.
03 13 51 44  CMP  Roger. It is NORMAL.
03 13 51 45  CC  Okay. Block data, starting to read: 057 dash 2 Alfa plus 242 minus 0270 089 0620 3382, 58 dash 1 Charlie plus 200 minus 0600 090 3041 3332, 059 dash 1 Alfa plus 270 minus 0640 092 0654 3349, 060 dash 1 Alfa plus 310 minus 0644 093 4329 3409, 061 dash 1 Alfa plus 306 minus 0645 095 2000 3659, 062 dash 1 Alfa plus 254 minus 0640 096 5238 2888. Read back, please.
03 13 54 39  CMP  Roger. 57 dash 2 Alfa plus 242 minus 0270 089 0620 3382, 058 dash 1 Charlie plus 200 minus 0600 090 3041 3332, 059 dash 1 Alfa plus 270 minus 0640 092 0654 3349, 060 dash 1 Alfa plus 310 minus 0644 093 4329 3409, 061 dash 1 Alfa plus 306 minus 0645 095 2000 3659, 062 dash 1 Alfa plus 254 minus 0640 096 5238 2888.
03 13 55 50  CC  Readback is correct.
03 13 55 54  CMP  Roger.
03 13 56 16  CC  Apollo 7, Houston. We are still showing real time on SM, and would you check TMP power NORMAL again?
03 13 56 29 CMP  Oh. Roger. I got it now.
03 13 56 34 CC  Roger.
03 13 57 40 CC  Apollo 7, Houston. One minute LOS Redstone; Ascension at 17.
03 13 57 49 CMP  Roger. Houston.
ASCENSION (REV 55)
03 14 18 02 CC  Apollo 7, Houston. Acquisition Ascension. Standing by.
03 14 18 30 CC  Apollo 7, Houston. Acquisition Ascension. Standing by.
03 14 18 36 CMP  Roger. You're very garbled, Houston.
03 14 18 39 CC  Roger. Understand.
03 14 22 18 CC  Apollo 7, Houston. Coming up on LOS Mercury at 53.
MERCURY (REV 55)
03 14 55 13 CC  Apollo 7, Houston. Acquisition Mercury standing by.
03 14 55 19 CMP  Roger. Houston, Apollo 7.
03 14 55 28 CMP  Bill, could you get me the static vent update for our orbital map?
03 14 55 32 CC  Stand by.
03 14 56 16 CC  Apollo 7, Houston. The GET for the nodal crossing is 84 plus 49 plus 48.
03 14 56 35 CMP  Roger. Understand. 84 plus 49 plus 48.
03 14 56 39 CC  Right. And it will be 3.1 west --
03 14 56 46 CMP  Roger. Thank you.
-- and it is REV 54.

Roger.

Okay.

GUAM (REV 55)

Apollo 7, Houston. Acquisition Guam. I will have a flight plan update at Redstone, and it has several items.

Roger. Understand.

REDSTONE (REV 55)

Apollo 7, Houston.

Houston, stand by one. I'll be with you in 1 minute.

Houston ...

Apollo 7, Houston.

Roger. Houston, Apollo 7. Go.

Roger. Donn, I have a rather extensive flight plan update; and what I'd like for you to do is just follow me with the flight plan, and we'll go through here from about 88 hours right on through up to 100 hours.

Apollo 7, Houston. Opposite omni.

Apollo 7, Houston. Just let me know when you're ready to copy.

Roger. Go ahead, Bill. I'm ready.

Donn, do you have the flight plan there?

Roger.
CC: Okay.

CC: Roger. I've got it right in front of me.

CC: Right. Good. Because I didn't want you to have to write it on anything else. At 88 hours, delete the reference to P30.

CC: Roger.

CC: Okay. Now on the next half of the page, from 88 to 90, you can delete everything on that page, and there'll be two additions so you can just draw a line through all of those if you want.

CC: Should be what?

CC: We'll delete, cancel all the actions listed from 88 hours to 90 hours.

CC: Right. I got that.

CC: Okay. At 89 hours, there'll be a CMC power up, program 5.

CC: What time?

CC: 89 plus 00.

CC: Roger. 89 hours power up?

CC: Roger. At 89 plus 30, you'll get an update for RAD degradation test; that'll be a state vector and time of ignition.

CC: Okay. Are you ready for 90 hours?

CC: Bill, you're cutting in and out. I'm only getting about half of this.

CC: Okay. I'll say again. Did you get those two additions? Did you get the one at — — —
03 15 31 13 CMP Negative. All I got was delete everything from 88 through 90 and then power up at 89.

03 15 31 19 CC Roger. Okay. At 89 plus 30, there will be an update for radiator degradation.

03 15 31 29 CMP Just a minute.

03 15 31 36 CC Okay. At - are you still reading?

03 15 31 42 CMP Roger. You want the whole G&N up at that time or just the computer?

03 15 31 47 CC Well, let's see. Right, that's correct, that's a complete power up at 89 hours.

03 15 31 56 LMF Okay.

03 15 32 02 CC And at 89 plus 30, the update will be for the radiator degradation test. Starting at 90 hours, you can delete everything on that page.

03 15 32 21 CMP Roger.

03 15 32 23 CC And at 90 hours and about 10 minutes, you can put in there P51.

03 15 32 35 CMP Roger.

03 15 32 36 CC At 91 hours and 42 minutes, a P52.

03 15 32 48 CMP Wait a minute; 91 hours is in the daytime.

03 15 32 52 CC 91 42. Donn, we're getting ready for LOS here. I'll talk to you at Antigua.

CANARY (REV 56)

03 15 54 57 CC Apollo 7, Houston.

03 15 55 11 CC Apollo 7, Houston. Acquisition Canary.
Apollo 7, Houston. We'd like to continue with the flight plan update when you're ready.

Roger. Go ahead, Bill.

Roger. I think we were talking about 91 hours and 42 minutes, a P52, and you were questioning nighttime; and the nighttime is starting to move back a little bit because of the change in the orbit, and that should be all right just after sunset.

Roger. I didn't get the minutes on that: 91 42 for a P52?

Roger. That's right: 91 plus 42. Okay. On the second column of page 2-36, starting at 92 hours: at 92 25 23, we have an MCC update. You can scratch through everything except the GO/WO-GO. And at 92 plus 35, add "Initiate radiator degradation test".

Roger. Say again that time for that.

92 plus 35.

Okay. Got it.

Right. You can delete the P30 - all the references to preparation for the burn, of course; you can delete those. At 93 plus 15, add "$H_2$ strat test (percent)" is what they'll estimate you have at that time.

So that will be at 93 plus 15, $H_2$ strat test (60 percent).
Roger. Got it.

And the canister change does stay in.

Okay.

At 94 hours, fuel cell O₂ purge.

Okay.

Next page. 9½ hours plus 30, unstow and set up TV.

Roger.

And, of course, the - you can delete the items in there about the radiator degradation test and H₂ heaters ON at 95 hours.

Okay.

At 95 plus 25, TV ON. That will be at Texas AOS; 95 plus 25, TV ON.

Roger. I got you.

Okay. On the next column, at 96 plus 40, delete the reference to the ECS radiator degradation test.

Roger.

At 97 hours, add "End radiator degradation test". You will have started it up about 92 35.

Okay.

Also, at 97 hours, you'll receive update for scanning telescope star count. That'll be at 97 hours, update SCT star count.

Okay.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 16 00 25</td>
<td>CC</td>
<td>And for that, the sun line of sight (LOS) will be 70 degrees.</td>
</tr>
<tr>
<td>03 16 00 39</td>
<td>CMP</td>
<td>Roger</td>
</tr>
<tr>
<td>03 16 00 40</td>
<td>CC</td>
<td>At 97 plus 40, program 52.</td>
</tr>
<tr>
<td>03 16 00 52</td>
<td>CMP</td>
<td>Roger. Is that option 3?</td>
</tr>
<tr>
<td>03 16 00 55</td>
<td>CC</td>
<td>Stand by. Be at C align time. At 98 hours, the test - the SCT star count will be performed.</td>
</tr>
<tr>
<td>03 16 01 20</td>
<td>CMP</td>
<td>At what time?</td>
</tr>
<tr>
<td>03 16 01 21</td>
<td>CC</td>
<td>98 hours</td>
</tr>
<tr>
<td>03 16 01 25</td>
<td>CMP</td>
<td>98 even?</td>
</tr>
<tr>
<td>03 16 01 26</td>
<td>CC</td>
<td>Affirmative</td>
</tr>
<tr>
<td>03 16 01 30</td>
<td>CMP</td>
<td>I don't understand that. That's right in the middle of the night pass, isn't it?</td>
</tr>
<tr>
<td>03 16 01 36</td>
<td>CC</td>
<td>Roger. And it continues into the day.</td>
</tr>
<tr>
<td>03 16 01 45</td>
<td>CMP</td>
<td>... that's going to be a little hard to - you going to realign at 97 40 and then do the test at --</td>
</tr>
<tr>
<td>03 16 01 52</td>
<td>CC</td>
<td>Roger. Just on the further edge of LOS. If you read, that is affirmative.</td>
</tr>
<tr>
<td>03 16 01 58</td>
<td>CMP</td>
<td>Roger</td>
</tr>
<tr>
<td>03 16 58 13</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>03 16 58 16</td>
<td>CMP</td>
<td>Roger, Houston. Go.</td>
</tr>
<tr>
<td>03 16 58 18</td>
<td>CC</td>
<td>Roger. Acquisition Redstone. I have one final item here on the flight plan update.</td>
</tr>
<tr>
<td>03 16 58 31</td>
<td>CMP</td>
<td>Ready to go.</td>
</tr>
</tbody>
</table>
03 16 58 34 CC Roger. At 99 plus 30, we will have a G&N, N and
SOS power down.

03 16 58 45 CMP Roger.

03 17 06 05 CC Apollo 7, Houston. One minute LOS Redstone;
Antigua at 17. And when we come up on Antigua,
we would like for you to be in POO. We'll have
a state vector for you at that time.

ANTIGUA (REV 57)

03 17 18 00 CC Apollo 7, Houston.

03 17 18 07 CMP Roger. Go.

03 17 18 08 CC Roger. We have a state vector to send to you
if you could go to POO, please.

03 17 18 16 CMP Stand by one.

03 17 19 10 CC Apollo 7, Houston. If you don't get your com-
puter up here, it's all right. We can give this
to you at Canary, but I do have a NAV check I
can give you when you're ready to copy it.

03 17 19 22 CMP Roger. Stand by. I'm still on a 51 here.

03 17 19 26 CC Okay.

03 17 20 49 CMP ... Houston, Apollo 7.

03 17 20 50 CC Go.

03 17 20 52 CMP Roger. I'll take that update now if you can
send it up.

03 17 20 54 CC Roger.

03 17 20 56 CMP Go to ACCEPT if you want to uplink.

03 17 20 58 CC Roger.
03 17 21 15  CC  And, Donn, while it's coming up, I have a NAV check here when you're ready to copy.

03 17 21 21  CMP  Roger.

03 17 21 46  CMP  Go ahead with your NAV check, Bill.

03 17 21 48  CC  Roger. 092 05 0000 minus 1796 minus 14661 1566. Read back.

03 17 22 18  CMP  Roger. 092 05 0000 minus 1796 minus 14661 1566. Readback is correct.

03 17 22 29  CC  Apollo 7, Houston. About 1 minute LOS Antigua.

03 17 23 21  CMP  Roger.

03 17 23 22  CC  And it will be Canary at 28.

03 17 23 24  CMP  Roger.

03 17 28 08  CC  Apollo 7, Houston.

03 17 28 12  CMP  Apollo 7. Go.

03 17 28 14  CC  Roger. We would like for you to cycle the - stand by.

03 17 28 52  CC  Apollo 7, Houston. Which of your O_2 tank fans is OFF?

03 17 28 58  CMP  Number 2 is OFF.

03 17 28 59  CC  Number 2 is OFF. Roger. That's what we thought.

03 17 29 55  CC  Apollo 7, Houston. We are through with the computer.

03 17 29 58  CMP  Roger.

03 17 32 37  CC  Apollo 7, Houston. We'd like for you to cycle your O_2 tank 2 fans ON for 5 minutes, then OFF.
03 17 32 49  
CMP  Roger.
03 17 34 51  
CC  Apollo 7, Houston. One minute LOS Canary; Carnarvon at 05. Just for a time hack, you can turn those fans back off about 36.
03 17 35 06  
CMP  Roger.

03 18 05 30  
CC  Apollo 7, Houston.
03 18 05 34  
CMP  Houston, Apollo 7. Go.
03 18 05 36  
CC  Roger. Acquisition Carnarvon. Standing by.
03 18 05 40  
CMP  Roger.
03 18 05 43  
CC  Donn, I noticed you were going through the malfunction procedure there - appeared to be just about the time we were losing you at Canary. Did you find out anything in that?
03 18 05 54  
CMP  Roger. I found out whatever it was went away, I think, at least up to now.
03 18 06 03  
CC  Whatever it was went away, huh?
03 18 06 06  
CMP  Right.
03 18 06 13  
CC  Did you arrive at that just from going through this malfunction procedure? Is that how you did that?
03 18 06 19  
CMP  Well, not totally.
03 18 06 21  
CC  Okay. Disregard.
03 18 06 23  
CMP  Wait until Wally gets up here. He may want to do it again.
03 18 06 26  
CC  Okay.
HONEYSUCKLE (REV 57)

03 18 18 42 CC Apollo 7, Houston. One minute LOS Honeysuckle; Redstone at 32.

REDSTONE (REV 57)

03 18 32 52 CC Apollo 7, Houston. Acquisition Redstone. Standing by.

03 18 39 15 CC Apollo 7, Houston. One minute LOS Redstone; Antigua at 50.

03 18 39 24 LMP Apollo 7. Roger.

03 18 39 28 CDR I gather you were in kind of a hurry to get us to work down there today.

03 18 39 34 CC We have a few things. Roger.

03 18 39 41 CDR I suggest somebody for tomorrow get to work on the sleep plan. You've cut us out of an hour's sleep already.

03 18 39 49 CC Roger.

03 18 39 55 CDR And three have colds. I asked for an hour and a half sleep for each of us last night, and that apparently was ignored.

03 18 40 28 CDR Houston, Apollo 7.

03 18 40 30 CC Roger. Go. We're just about to LOS.

ANTIGUA (REV 58)

03 18 51 11 CC Apollo 7, Houston.

03 18 51 19 CMP Houston, Apollo 7.

03 18 51 21 CC Roger. I just checked in the flight plan here regarding Wally's query there over Redstone, and
I didn't get all of it, but it was something about the sleep cycle being shortened. And when I came on, the time line showed the commander's and LMP's sleep cycle extended to 91 hours. Is that the way you understood it?

That's affirmative. But you did have ... someone moved up the radiator test right in the middle of it.

We got the radiator test initiated at 92 30. Right?

Roger. Stand by.

We're just gonna have to put on our headsets and go to work up here.

Apollo 7, Houston. We acknowledge the error on the ground here.

Okay. Let's have the ground get to work and look at the sleep/rest cycles. We had to initiate the request as it was to get only 5 hours per shift sleep scheduled this last night. I asked for an extension and got it. I want the rest of these work periods worked out now. Apparently, we can move up burn 3. How about giving us a chance to get some sleep?

Apollo 7, Houston. Understand.

Houston, Apollo 7.

Go.
Roger. Bill, can you check – I think I'd like to go ahead and try to activate our primary water boiler before we commence the radiator degradation test. And then if the – we have any problems while doing the radiator degradation test, such as our primary water boiler goes down, find out if it's okay to activate the secondary loop with the radiator bypass. Over.

Roger. Stand by.

Roger. Walt, I have something here, and I think it's pretty close to what you said. I'll go through a recommended procedure here.

Okay. Is it something I have to write down or not?

No. Why don't you listen to it first? I think it's just what you wanted there.

Go ahead.

Step 1, prior to test, reservice evaporator, if not already reserviced. Step 2, begin the actual test. Three, activate primary evaporator in AUTO mode. Four, if evaporator dries out, close back pressure control valve and wait 15 minutes. Five, then reservice evaporator and reactivate in AUTO mode. Six, if evaporator dries out again, close back pressure control valve and shut down evaporator. Seven, continue test. Eight, if evaporator
out count exceeds 80 degrees Fahrenheit, activate secondary loop with radiators bypassed and continue test.

03 18 55 14 LMP Only one question with that. The 80 degrees Fahrenheit - the rule in the past has been activate secondary loop if the temperature of the glycol evaporator outlet exceeded 60. Can you confirm that?

03 18 55 26 CC Stand by.

03 18 56 29 CC Apollo 7, Houston. Regarding the 80-degree count, they say they are willing to go that high. If you activate the secondary lower than that, it compromises the test. I said that I thought that we ought to go ahead and look at working it at 60, and they're checking into it.

03 18 56 50 LMP Okay. Understand. I don't think there's any great big problem with letting it go a little higher, Ron. I think we've got a good chance of not having to activate it anyway, but that's just a conjecture now.

03 18 57 00 CC Okay.

03 18 57 01 LMP Bill, I mean, sorry.

03 18 58 03 CC Apollo 7, Houston.

03 18 58 07 LMP Roger. Go ahead, Bill.

03 18 58 08 CC Hey, Walt, I have a DSE recording plan for this radiator degradation test, and I'd like to pass
it to you over CANARY at a time that it would be convenient.

It has to do with leaving it in high bit rate for portions of the test.

CANARY (REV 58)

Apollo 7, Houston.

Roger, Houston. Go ahead.

Roger. Acquisition CANARY.

Roger. Did the O\textsubscript{2} partial pressure this morning about almost 33 minutes ago was 240 mm of Mercury. Ready to copy your recording update.

Roger.

Houston, Apollo 7.

Go.

Houston, Apollo 7.

Apollo 7, Houston. Go.

Roger. We can now report that the handcontroller is GO.

Roger. Handcontrol is GO.

That's affirmative. The anomaly has disappeared, and I'm quite surprised you all weren't somewhat concerned about that; that wiped out our hybrid deorbit for awhile.

We were concerned.

You'll have to clear some time for me before I get a critical test.
Roger. There was quite a lot of concern down here.

Roger. Well, it takes awhile to check those things out.

Roger. Also --

Let's go.

Okay. On the DSE recording for radiator degradation test, I'll read a few comments first. For radiator degradation test, spacecraft will be left in high bit rate. Spacecraft COMM system will be set up for high bit rate record by command. At the following time, place the tape recorder forward switch to FORWARD for 3 minutes, then to OFF. Ready to copy times? At 92 plus 57, 93 plus 37, 94 plus 29, 95 plus 08, 96 plus 01, 96 plus 33. Comment: do not use up telemetry command RESET switch during radiator degradation test. Note: you can only record voice while tape is running as scheduled above.

Okay. I've got the time in, and I'd like you to repeat the last comment. The attention is to - I assume you people are going to rewind and leave us with a fresh roll of tape to start with? And, we'll put it to FORWARD; I also assume you were going to leave it with my command here, and I'll have to hit COMMAND RESET switch
at the start of test. I will go to FORWARD for
3 minutes and then to OFF at the following times:
92 plus 57, 93 plus 57, 94 plus 29, 95 plus 08,
96 plus 01, 96 plus 33. Over.

03 19 06 41 CC Roger. The second time was 93 plus 37, and also
you do not go to COMMAND RESET.

03 19 06 55 LMP Okay. Understand you are going to have every-
thing set up, and all I will use is tape recorder
motion switch going to FORWARD at those times.

03 19 07 04 CC That's affirmative.

03 19 07 07 LMP And we can record at the time the tape is run-
ning. Was there anything else in that last
comment?

03 19 07 12 CC Negative. That's correct. You can only record
voice while tape is running as scheduled at
these times, and you did get --

03 19 07 21 LMP Roger. And I assume you got a plan to dump all
that out and give us a fresh tape as soon as pos-
sible afterwards. Did you read my comment that,
at 91 hours into the flight, O₂ partial pressure
was 240mm of Mercury?

03 19 07 36 CC Roger. At 91 hours, O₂ partial pressure 240mm.
Also, we're setting up for a 10-hour sleep cycle
for tonight.

03 19 07 49 LMP Ten hours is - How about eight?
03 19 07 53  CDR  Bill, we can't do that, sleep five one time and ten the next. Try to get nearer an average of eight. We'll go for eight tonight, and that will be plenty.

03 19 08 02  CC  Okay.

CARNARVON (REV 58)

03 19 37 24  CC  Apollo 7, Houston. Acquisition Carnarvon.

03 19 37 41  CMP  Roger, Houston.

03 19 37 46  CC  Apollo 7. I have a couple of items. First, in reference to the secondary loop activation during the radiator tests, we have confirmed that 80 degrees EVAP OUT TEMP is an acceptable hardware limit. However, secondary loop may be activated before 80 degrees Fahrenheit as physical comfort dictates. Two, in reference to the handcontroller anomaly, we would like to know which check or test did you use to verify the acceptable performance?

03 19 38 26  CMP  Roger. We used the standard malfunction procedure starting with the CMC troubleshooting technique. If the thing passed that test, then we went on with the rest of it - it's on page 15 - page - it's item 2, page 14 - and the final was the time itself in there where the anomaly occurred. It did not occur there again.

03 19 38 51  CC  Roger.
... zero.

And there was a discrepancy with the malfunction only implied. This is the failure where the controls are stuck ON. Where the malfunction occurs, the function will not occur.

Roger.

And in that same case, the final two digits on number 1 register of the DSKY would be 75 for pitch down. If the thing was stuck on 75, it saw immediately; it could not show.

Roger.

And, Bill, do you want me to follow the procedure that was passed up the first time we reactivated the primary water boiler? I had several steps here. I think you were probably there when you passed it up even.

Stand by on that.

Do you recall the one?

Yes, we know; we want to confirm.

And when you get it, we can use a chart update, please.

Roger.

Apollo 7, Houston. I have a chart update.

Go.

Live 57 node at 89 plus 16 plus 24, 71.4 degrees west.
Roger.

Okay.

Apollo 7, Houston. Yes, we would like for you to activate it just as you did yesterday.

Okay. And if it checks down, you want to wait 15 minutes again, right?

Affirmative.

All right. Just for my own information, what is a 15-minute wait, if it shuts down like that?

Stand by.

Apollo 7, Houston. We will get that answer. It will take a few minutes.

Okay. Thanks, but you understand I just wondered why we wait 15 minutes before we try to reservice the thing. I don't quite understand it.

Okay.

Apollo 7, Houston. I've been informed that flash freezing is the reason for waiting 15 minutes.

Roger. Thank you.

Bill, is that any relation to Flash Gordon?

Oh, boy.

That's the first "oh, boy" for the flight.

Roger. You got me again.

That's the first "oh, boy" we've logged for the flight.
I'm having bacon and toast and peaches and --

Apollo 7, Houston. Coming up on LOS Carnarvon.
S-band volume up, please.

HONEY Suckle (Rev 58)

Apollo 7, Houston. We are working on it.

Apollo 7, Houston. The antenna for the radiator degradation test will be omni Alfa. There may possibly be a switch to B Bravo, but now it looks like A is the good one.

Roger, Bill.

We've got some beautiful pictures of the great barrier reef in New Zealand this morning.


It was about 5 frames - some frames 43 to 47.

We weren't quite sure where we were until we got that chart update. It was frames 38 to - 43 to 47 on magazine F.

Roger.

Apollo 7, Houston. One minute until LOS; Texas at 19.

Roger.
**TEXAS through ANTIGUA (REV 58)**

<table>
<thead>
<tr>
<th>Time</th>
<th>CC</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 20 21 03</td>
<td>Apollo 7, Houston through Texas.</td>
<td></td>
</tr>
<tr>
<td>03 20 21 10</td>
<td>CMP</td>
<td>Roger, Jack. Go.</td>
</tr>
<tr>
<td>03 20 21 12</td>
<td>CC</td>
<td>Roger. Standing by. Down, how are you this morning?</td>
</tr>
<tr>
<td>03 20 21 15</td>
<td>CMP</td>
<td>Just fine, Jack.</td>
</tr>
</tbody>
</table>

**TEXAS through BERMUDA (REV 59)**

<table>
<thead>
<tr>
<th>Time</th>
<th>CC</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 20 25 12</td>
<td>Apollo 7, Houston.</td>
<td></td>
</tr>
<tr>
<td>03 20 25 21</td>
<td>LMP</td>
<td>Roger. Go ahead.</td>
</tr>
<tr>
<td>03 20 25 22</td>
<td>CC</td>
<td>Roger. We'd like to know whether you have shown any restarts on the computers since we last talked to you at Carnarvon.</td>
</tr>
<tr>
<td>03 20 25 29</td>
<td>LMP</td>
<td>That's affirmative. We're now flying to attitude for the radiator degradation. I had loaded P30 incorrectly the first time. In loading P30 - trying to load it correctly - we ended up giving it an insoluble problem here and got a restart on it.</td>
</tr>
<tr>
<td>03 20 25 49</td>
<td>CC</td>
<td>Okay. Thanks, Walt.</td>
</tr>
<tr>
<td>03 20 25 54</td>
<td>LMP</td>
<td>We may be just a tad late getting the attitude. Why don't we give you a hack at the start time when we start the radiator degradation test? It may be a few minutes after 92 35.</td>
</tr>
<tr>
<td>03 20 26 05</td>
<td>CC</td>
<td>Okay. That's fine.</td>
</tr>
<tr>
<td>03 20 26 28</td>
<td>CC</td>
<td>Walt, we show two restarts here since we last saw you at Carnarvon.</td>
</tr>
</tbody>
</table>
03 20 26 37 LMP We did it twice.
03 20 26 39 CC Ah so.
03 20 26 47 LMP We're still in the P40, and we proceeded to the end - trying to proceed to the end of P40, and it still didn't light the answer, and then we just reselected POO.
03 20 26 58 CC Okay. Fine.
03 20 29 29 CC Apollo 7, Houston. We're not receiving any BIOMED data. Do you have the harness hooked up?
03 20 29 42 LMP Roger. We have the CDR connected, and he's busy with his own radiator test.
03 20 29 51 CC Roger. Understand.
03 20 29 55 LMP We have other things happening right now.
03 20 29 58 CC Say again, Walt?
03 20 30 05 LMP He'll be back on BIOMED in about - shortly.
03 20 30 09 CC Okay. We'll be standing by.
03 20 32 22 CC Apollo 7, Houston. You have a GO for 77 dash 1.
03 20 32 28 LMP Roger. Go 77-1. And we will be in attitude and starting radiator degradation test on time.
03 20 32 35 CC Roger. Copy. We're about to lose you over Bermuda; pick you up Canaries at 92 36.
03 20 32 42 LMP Roger.
03 20 36 39 CC Apollo 7, Houston through Canary.
03 20 36 43 LMP That was 92 35, and we have manually selected radiator 2.
03 20 36 49 CC Roger. Copy that.
03 20 36 52 IMP The evaporator seems to be working for now. I wouldn't - I don't know how long we can count on it.
03 20 36 57 CC Roger.

TANANARIVE (REV 59)

03 20 40 20 CC Apollo 7, Houston. We would like tape recorder forward switch to OFF, and then your DSE will be configured for this test.
03 20 40 31 IMP Tape recorder forward is OFF.
03 20 40 57 IMP Hey, Jack, we have the water boiler operating, but it - in very fact - seems to be driving us against the stops here. Looks like it is going to cost us more than we had thought it would.

03 20 41 13 CC Roger. I'm watching it.
03 20 42 25 CC Apollo 7, 1 minute LOS Tananarive; Carnarvon at 93 11.
03 20 42 31 IMP Roger.

CARNARVON (REV 59)

03 21 11 46 CC Apollo 7, Houston through Carnarvon. Standing by.
03 21 11 51 IMP Roger, houston. We've been in this - we've been in this mode now for about 36 minutes, Jack, and we were in ATTITUDE HOLD and pitch and yaw, and the machine was spitting out pulses at the rate about nine to ten a minute and - which was pretty
expensive. Donn has now gone to - with the pulse
mode no ATTITUDE HOLD on all three axes and seems
to be doing better on the thing, but you might
take a look. We would like to have a figure on
board here - if you can get it to us - how many
pulses to the pound of fuel?

Roger. Stand by.

Apollo 7, Houston.

Go, Jack.

Okay. Wait, on your question on the fuel usage
and minimum impulse: fuel usage is about
.01 pounds for each engine that pulses, so if
you are using two jets for each axis, it's
.02 pounds every time it pulses.

A hundred pulses to a pound.

Yes, so you are going to get - you can get
100 jet firings per pound.

CARNARVON (REV 59)

Roger. Understand. Thank you very much. We
had 35 minutes worth at about ten pulses - nine
to ten pulses a minute.

Okay. Copy that.

Now we are down to two to four pulses a minute.

Roger. Understand. And we have got about
30 seconds till we lose you here. Do you want
to turn up your S-band volume? And we'll pick
you up over Honeysuckle.
HONEYSUCKLE (REV 59)

03 21 26 58 CC Apollo 7, Houston. One minute LOS Honeysuckle; Guaymas at 93 plus 49.

03 21 27 06 LMP Roger, Houston.

GUAYMAS through BERMUDA (REV 59)

03 21 50 17 CC Apollo 7, Houston through Guaymas.

03 21 50 21 LMP Roger, Jack.

03 21 50 24 CC Roger. I hear you five-by.

03 21 50 25 LMP Roger.

03 21 50 26 CC I would like to ask you how the H₂ stratification test went.

03 21 50 32 LMP I haven't done that test yet. If things get pretty well settled down, I will go ahead and run it; but it's not critical, and I'm not at 60 percent yet on either gage.

03 21 50 41 CC Roger. Understand. And, also, I would like to verify the position of - that the hand control power switch is at BOTH.

03 21 50 49 LMP That is correct.

03 21 50 51 CC Okay. Fine.

03 21 53 06 CMP Houston, Apollo 7.

03 21 53 09 CC Go ahead, 7.

03 21 53 11 CMP Can you verify with your individual temps that we actually are selected radiator 2?

03 21 53 32 CC Apollo 7, affirmative. We can verify that. We are watching it.
Also, if everything is running nominal on this thing, we obviously don't have any battery degradation. Is there any reason for --

Say again, 7. You got cut out.

Stand by. Is there any reason for running it the full 4 and 1/2 hours if we find that the radiators are working good? It would be nice if we could save the fuel if we could draw conclusions earlier.

Roger, 7. If it's at all possible when we look at that thing, we will try to cut it off early.

Roger. Understand. You know what I'm getting at, Jack.

Yes, I do.

GUAYMAS through BERMUDA (REV 60)

Apollo 7, Houston. We would like you to place your O₂ fans and tank 2 ON for the next 5 minutes.

Wait one.

Apollo 7, Houston.

Go ahead.

Roger. We would like to send you a new state vector. Would you go to ACCEPT?

Okay. Let me take a little check. We're trying to monitor something on it, but ...
<table>
<thead>
<tr>
<th>Time</th>
<th>Station</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 22 03 03</td>
<td>CDR</td>
<td>Jack, can you uplink to that ... display? We're using that to fly by.</td>
</tr>
<tr>
<td>03 22 03 08</td>
<td>CC</td>
<td>Roger. I figured that, but what we would like to do is to give you a --</td>
</tr>
<tr>
<td>03 22 03 14</td>
<td>LMP</td>
<td>That's okay, Jack. I'll turn loose ...</td>
</tr>
<tr>
<td>03 22 03 16</td>
<td>CC</td>
<td>Okay. We can send this at Canary if you would rather wait.</td>
</tr>
<tr>
<td>03 22 03 24</td>
<td>LMP</td>
<td>It's clear now.</td>
</tr>
<tr>
<td>03 22 03 25</td>
<td>CC</td>
<td>Okay. Coming up.</td>
</tr>
<tr>
<td>03 22 04 06</td>
<td>CC</td>
<td>Apollo 7, I'm ready to give you the NAV check PAD when you are ready to copy.</td>
</tr>
<tr>
<td>03 22 04 13</td>
<td>LMP</td>
<td>Wait one.</td>
</tr>
<tr>
<td>03 22 04 26</td>
<td>LMP</td>
<td>We'll take it later.</td>
</tr>
<tr>
<td>03 22 04 28</td>
<td>CC</td>
<td>Okay. Just let me know when you are ready.</td>
</tr>
<tr>
<td>03 22 05 02</td>
<td>CC</td>
<td>Apollo 7, Houston. We are through with the update; the computer is yours.</td>
</tr>
<tr>
<td>03 22 05 10</td>
<td>LMP</td>
<td>Right.</td>
</tr>
<tr>
<td>03 22 06 42</td>
<td>CC</td>
<td>Apollo 7, Houston. You can turn your O_2 tank 2 fans off.</td>
</tr>
<tr>
<td>03 22 11 23</td>
<td>CC</td>
<td>Apollo 7, Houston through the Canaries. Standing by.</td>
</tr>
<tr>
<td>03 22 11 28</td>
<td>CDR</td>
<td>Do you want tank 2 fans on for 5 minutes?</td>
</tr>
<tr>
<td>03 22 11 37</td>
<td>CC</td>
<td>Roger. You can turn them off now. Did you have them on for 5 minutes, Wally?</td>
</tr>
</tbody>
</table>
03 22 14 03  CC  Apollo 7, Houston. We are not reading the
CDR's BIOMED data. Would you switch to IMP?

03 22 14 13  CC  Oh, 7, we just got CDR data.

03 22 14 17  CDR  Roger. I just came on the line.

03 22 14 21  CC  And I have this NAV check data PAD to pass up
to you whenever you are ready.

03 22 15 07  CDR  Go ahead.

03 22 15 15  CDR  Go ahead, Jack.

03 22 15 16  CC  Okay. The NAV check GET is 09h plus 15 plus 00
00 plus 2310 minus 01215 089.8.

03 22 15 41  CDR  Repeat the whole thing, will you please, Jack?

03 22 15 44  CC  Roger. GET is 09h plus 15 plus 00 00 plus
2310 minus 01215 089.8.
03 22 16 11  CDR  Roger. 094 15 four balls plus 2310 minus 01215 089.8.
03 22 16 19  CC  Roger. That's got it.
03 22 16 26  CDR  What's the hot scoop in Houston today?
03 22 16 30  CC  Roger. We're about 30 seconds LOS Canary;  Tananarive at 94 plus 30.
03 22 16 38  CDR  Roger. Do you have news in Houston?
03 22 16 42  CC  Oh, it was real fine this morning.
03 22 16 48  CDR  ...

TANANARIVE (REV 60)
03 22 30 32  CC  Apollo 7, Houston through Tananarive.
03 22 30 40  CDR  ... just crossing the States here up around  ... Madagascar ...
03 22 30 45  CC  Roger. You're loud and clear. We monitored  your fuel real closely during that first rev  in the radiator degradation test, and we show  a usage of approximately 5 pounds. We are  really watching it. We'll let you know. And  I'll let Gino read you the morning news.
03 22 31 07  CC  Good morning up there.
03 22 31 12  CDR  Roger. This is ... of the coast between  Madagascar and Africa.
03 22 31 27  CC  Wally, this is Gino. I've got a little news  if you want to read - listen.
03 22 31 40  CDR  ... off the harbor at Dar Es Salam.
03 22 32 11  CC  7, this is Houston.
This is Apollo 7. Go.

Walt, I got a little morning news here if you would like us to send it up.

Yes, go ahead. Go ahead.

Okay. This morning the headlines have described your burn yesterday - your last burn, as "perfect." However, it goes on to say there was a 9-minute burn.

Beautiful.

Randy Matson won an Olympic Gold Medal in his shot yesterday and so did Houston's sprinter Jim Hines who won the 100-meter dash in 9.9.

That's moving!

And the Astro's lost four ballplayers to Montreal in the expansion draft in the National Baseball League.

Who did they lose?

Stand by. We'll get that for you later; I'm not sure. Wire services also picked Southern Cal as the number 1 college team in the nation, and I think Donn will appreciate this next statement. Somehow, when Ohio State managed to slip by the Boilermakers last Saturday, they slipped into the second ranking.

Roger. I'm surprised they are not first.
I don't know how they won that Saturday. Hey, it looks like your cards and letters are coming in here real strong over the past 24 hours, and your TV ratings on the Monday morning show are pretty high.

Was it announced on the Today Show, or were we on it?

You are going to have a couple hundred million people standing by. As a matter of fact, with a little work, we have managed to book you for another week.

We've got our straw hats; we'll try to make a show.

Okay. Wally, it was really a good show yesterday. The Astros lost Bateman, Brand, Dukes, and Herrera.

... catcher.

The weather looks real – looks good today in the Madagascar area.

Roger.

Gene, frame 49 was a small island on the north side of Madagascar.

Roger, Wally.

A small island similar to an atoll type.

Sounds like you guys are riding a real Cadillac up there. Things have been going real good from where we sit.
03 22 35 25  CDR  We've had some traumatic experiences with
    the AC 1 and AC bus 2 slipping out. Water all
    over the place, but it looks to be in good shape
    now if nothing goes wrong.

03 22 35 47  CDR  Actually, we've found the most uncomfortable suit
    was ... material.

03 22 35 56  CC    You are 1 minute LOS Tananarive; we'll see you
    at Carnarvon.

CARNARVON (REV 60)

03 22 46 32  CC    Apollo 7, Houston through Carnarvon.
03 22 46 35  LMP   Roger.
03 22 46 49  LMP   Jack, we were a little late on that last 3-minute
    tape dump business. It shouldn't be that clean.
    I don't think, though.
03 22 47 04  CC    Roger. Copy that, Walt.
03 22 47 45  LMP   Jack, can we have a chart update, please?
03 22 47 51  CC    Coming up; stand by.
03 22 47 54  LMP   Roger.
03 22 48 14  CC    Okay. Ready for your map update?
03 22 48 17  LMP   Go.
03 22 48 18  CC    Okay. For REV 60, the time of the node is
    95 plus 11 plus 44, longitude 162.3 west,
    right ascension of 05 plus 02.
03 22 48 40  LMP   Thanks, Jack.
03 22 48 42  CDR   Give them a call; that's real great the way they
    come up with it in a hurry. I appreciate it.
Roger.

Jack, we're going to need an update on the sleep cycle here. We can't let Donn go to sleep for the next hour.

Okay. We'll figure that out, Wally.

Calm or not, we're going to regroup on him. At 9:00 a.m. Cape time, we've caught him in our bed.

Roger.

No rush; we'll just hang in here.

Okay.

Jack, do we have a TV pass today?

Roger. You have a TV pass, Wally.

Okay. We'll be on top.

Okay. The time of TV will be about 95 plus 25, which is about - oh, about 45 minutes from now.

Roger.

Apollo 7, Houston. Do you want to turn up your S-band so we can pick you up over Honeysuckle?

Roger.

Houston, Apollo 7.

Go ahead, 7.

Roger. I had to use that gray tape that ... and taped that BIONED lead together that kept coming apart. I also used it to tape the microphone together and the lightweight head set, which started coming apart. The gray tape is pretty good gear.
03 22 52 15 CC Roger. Copy that.

HONEYSCULLE (REV 60)

03 22 54 24 CC Apollo 7, Houston.

03 22 54 26 CDR Go ahead, Houston.

03 22 54 28 CC Wally, on the sleep cycle there, we have 96 to 116 blocked out for a crew sleep cycle. This can be used in any way that the crew sees fit for sleeping arrangements.

03 22 54 45 CDR Very good.

03 22 55 58 CDR Well, Jack, good ole scene in sight here again. I have Perth at night.

03 22 56 14 CDR Houston, did you read?

03 22 56 19 CDR Houston, Apollo 7.

03 22 56 23 CC Apollo 7, Houston. Copy that.

03 22 56 24 CDR Roger.

03 22 56 29 CDR That's the home of Sloans Lager where I have my good beer these days.

03 22 56 33 CC Roger. Wally, they had an earthquake at Perth 2 days ago.

03 22 56 38 CDR Oh, really? That's terrible.

03 22 59 00 CC Apollo 7, Houston. We are about 1 minute from LOS Honeysuckle; we'll pick you up at Huntsville at 95 17.

03 22 59 09 CDR Roger. Out.

HUNTSVILLE (REV 60)

03 23 17 06 CT Huntsville AOS.
03 23 17 09 CC Apollo 7, Houston through the Huntsville. Standing by.
03 23 17 41 CT Huntsville two-wheel log, valid range.
03 23 18 03 CC Apollo 7, Houston through the Huntsville. Standing by.
03 23 19 26 CC Apollo 7, Houston through the Huntsville.
03 23 19 30 CDR Roger. Loud and clear.
03 23 19 32 CC Roger. Reading you five-by, Wally.
03 23 19 43 CDR ... Jack?
03 23 19 46 CC Go ahead.
03 23 19 49 CDR I could not hear your last transmission.
03 23 19 52 CC Okay. You're a little garbled - a little background noise, but readable.
03 23 20 02 LMP Hey, Jack. Understand TV coming on at 95 plus 25. Over.
03 23 20 07 CC Roger. Your TV time is 95 plus 25.
03 23 20 48 LMP Jack, if we start transmitting the TV at 25, how soon do you people see that in the Center?
03 23 21 08 CC Wait, it has to go through the scan converter, and it doesn't take too long. We get it fairly soon.
03 23 21 17 LMP When we initially ... started, we're coming down to Texas; and in the end, we end up coming through the Cape. That right?
03 23 21 29 CC I couldn't get that, Walt. Huntsville isn't real good, but we will catch you at California here.
03 23 21 37 IMP Roger. Do our first TV transmissions go through Texas, and then in the end, we are transmitting through the Cape?

03 23 21 43 CC That is affirmative.

03 23 25 02 CC Apollo 7, Houston.
03 23 25 06 CMP Roger, Houston. Go.
03 23 25 08 CC Roger. We'd like you to switch your S-band AUX switch.

03 23 25 15 CMP Switch S-band AUX to what?
03 23 25 16 CC S-band AUX to TV.
03 23 25 20 CMP Roger. Going to TV.
03 23 25 24 CMP It's ON.
03 23 25 26 CC Roger.

03 23 25 49 CMP How's it going, Jack. Do you read?
03 23 25 51 CC Not yet, Donn.
03 23 25 53 CMP Okay.

03 23 26 04 CC Starting to come through now, Donn.
03 23 26 06 CMP Okay.

03 23 26 13 CMP Can you see anything yet?
03 23 26 16 CC We're just getting - just starting to pick you up now.

03 23 26 28 CC Okay. We're starting to pick you up. You're looking good. It's a good picture. Looks like we can see the straps in the center seat zero g.

03 23 26 41 CMP Roger. Can you see me? I'm in the left seat.
<table>
<thead>
<tr>
<th>Time</th>
<th>Caller</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 23 26 44</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>03 23 26 45</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>03 23 26 51</td>
<td>CC</td>
<td>Looks like &quot;From the lovely Apollo Room, high stop everything.&quot;</td>
</tr>
<tr>
<td>03 23 26 56</td>
<td>CMP</td>
<td>That's right. Coming to you live from outer space, the one and only original Apollo orbiting road show, starring those great acrobats of outer space, Wally Schirra and Walt Cunningham.</td>
</tr>
<tr>
<td>03 23 27 20</td>
<td>CC</td>
<td>Just a minute, Wally. Let's see. Oh, it's a little message to Deke Slayton. A little bit closer, Wally. Kind of looks like something about &quot;Are you a, are you a -- That's right.</td>
</tr>
<tr>
<td>03 23 27 41</td>
<td>CDR</td>
<td>Looks like it says &quot;Are you a turtle, Deke Slayton?&quot;</td>
</tr>
<tr>
<td>03 23 27 42</td>
<td>CC</td>
<td>That's right.</td>
</tr>
<tr>
<td>03 23 27 46</td>
<td>CDR</td>
<td>You get A for reading today, Jack.</td>
</tr>
<tr>
<td>03 23 27 54</td>
<td>CMP</td>
<td>Here comes another one. Walt, oh, that-a-way, that's the way to turn it. It says, &quot;Paul Haney, are you a turtle?&quot;</td>
</tr>
<tr>
<td>03 23 28 13</td>
<td>LMP</td>
<td>You'll get a gold star; perfect score!</td>
</tr>
<tr>
<td>03 23 28 16</td>
<td>CC</td>
<td>And there is no reply from Paul Haney there.</td>
</tr>
<tr>
<td>03 23 28 21</td>
<td>CMP</td>
<td>You mean he's speechless?</td>
</tr>
<tr>
<td>03 23 28 37</td>
<td>CC</td>
<td>Apollo 7, Houston. Would you close the back pressure valves and go to INCREASE?</td>
</tr>
<tr>
<td>03 23 28 43</td>
<td>CMP</td>
<td>Roger. Stand by.</td>
</tr>
</tbody>
</table>
03 23 28 49 CC It's a real good picture.
03 23 28 52 CMP Roger.
03 23 28 53 CC You might take us on a little tour of your castle there if you have a chance.
03 23 29 01 CDR Okay. Stand by.
03 23 29 05 IMP I think we can work that out. Let's take it off the bracket and pan the cockpit a little bit.
03 23 29 17 CDR At this point, we are looking across the cockpit over Walt Cunningham's chest toward Donn Eisele, who's controlling the spacecraft ... for the radiator degradation test. There you see a pen cruising by, and I need to make some notes, obviously. From there, we concentrate on the left seat's attitude control. You can see possibly two of the instruments for attitude control over there. In the center panel, we have many of the switches that position the machine, that are complicated to fly, and we monitor our systems on this side. At this point, Walt Cunningham is working on the glycol evaporator steam pressure and the waterboiler. We've had quite a few problems on this, but we've a few of them solved with a little extra special attention.
03 23 30 13 CDR Looking across the cockpit to the right, we have most of our electrical power controls, fuel cell controls. Then, as we continue across the cockpit,
we'll come to the right side and that window where you can see the Gulf Coast outside, and with the weather and winds, we've got surf galore.

The outside doesn't show too well due to the ORB rate, Wally.

I am now going to work my way down into the lower equipment bay where we have our navigation station. Here you can see the heart of the navigation system of the Apollo spacecraft - the command module, that is - the sextant and telescope. The near large object is a monocular type device - is the telescope, and adjacent to it - the small instrument - is the sextant. We acquire a known star in the telescope, put it in the center of the telescope, and then acquire in the sextant where it can be marked on a rather carefully graduated set of gimbals to give us the exact position of the star.

GOLDSTONE through ANTIGUA (REV 61)

I'm now panning over to Wally who is going to get the telephoto lens out of its stowage compartment, and we'll attempt to do a little out-the-window photography.

Walt, the out-the-window doesn't show up very well, Walt, due to the ORB rate --

Do you want to skip the out-the-window?
<table>
<thead>
<tr>
<th>Time</th>
<th>CALL</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>03 23 32 01</td>
<td>CC</td>
<td>No, we'd like you to keep it inside. The ORB rate just makes it impossible to see much outside.</td>
</tr>
<tr>
<td>03 23 32 07</td>
<td>IMP</td>
<td>Roger. Understand. Okay.</td>
</tr>
<tr>
<td>03 23 32 12</td>
<td>CC</td>
<td>Wally, this is Gene. Deke just called in, and we've got your answer, and we've got it recorded for your return.</td>
</tr>
<tr>
<td>03 23 32 18</td>
<td>CDR</td>
<td>Roger. Real fine.</td>
</tr>
<tr>
<td>03 23 32 19</td>
<td>CDR</td>
<td>We'll now show you the lower equipment bay where we have the water control and oxygen control panels and one panel where we can also change the lithium hydroxide in flight - to change out carbon dioxide removal.</td>
</tr>
<tr>
<td>03 23 32 48</td>
<td>CDR</td>
<td>I've just opened one of our food bays, and when I pulled the curtain down, you'll notice that we have a real good package that is portable. This bay is near empty. We'll switch to another bay starting tomorrow.</td>
</tr>
<tr>
<td>03 23 33 07</td>
<td>CDR</td>
<td>This is an empty food bay with food rolled up rather tightly for the first 4 days of consumption. Our dietitian, Rita Rapp, will appreciate how tightly we repackaged the empty, torn-up packets of food.</td>
</tr>
<tr>
<td>03 23 33 35</td>
<td>CDR</td>
<td>And now, we will rotate the camera around through the lower equipment bay back out towards the cockpit. I'm sure - the spaghetti that you see, which is the CO2S cable, that I'm holding.</td>
</tr>
</tbody>
</table>
Walt Cunningham is working with our exercise device, using a bicycle motion to stimulate his cardiovascular system. You can take the same device in all the ... and use the arms in a curling motion to create an exercise in the upper torso. I'm going to swing now to the other side of the cockpit where you can see Donn is still maintaining the attitude of rather a tight deadband to prepare for our radiator degradation test.

You might say we have our lighter moments.

Have you got Haney's answer yet?

No, Haney isn't talking, Wally.

Roger. And how much more time do you want on this machine?

Somebody tells me he isn't talking, but just buying.

He is buying. Thank you very much. Very good.

We will now take you down below the couches to our storage area. This bottom opens up to be a sleep station. The object below is a headrest - swings off and stows. The large bulky bag that you see off to the camera left is where our surface suits are stowed at this time.

Jack, do you still have the picture working pretty well?
03 23 35 43 CC The picture quality isn't as good now after the
handover to the Cape, but we can still make it out.

03 23 35 51 CDR I'm going to take you through the area where the
water is collecting.

03 23 36 19 CDR This is the area where water was condensing on
the pipes, just below the commander's left shoul-
der. You will notice that the panel here was
refrigerated, and with the ... there is water
condensation on the pipe. We vacuumed it off
periodically, and it forms a large ball of about
the size of a ping pong or golf ball.

03 23 36 50 CC Okay. Wally, we've lost the picture now. We
copied the water condensation, and we saw the
beginning of your transmission on the water
condensation there.

03 23 36 58 CDR Very good.

03 23 37 01 CC That was a real good pass.

03 23 37 06 LMP Say, Jack, we've got the steam pressure off the
peg, but we don't seem to be able to put it back
up in the boiling range, and we are not boiling
now.

03 23 37 18 CC Walt, we would like you to reservice the primary
evaporator at 45 over the Canaries.

03 23 37 27 LMP Reservice - you want 2 minutes of water flow?

03 23 37 33 CC That is affirmative, Walt; 2 minutes of water
flow.
03 23 37 37 LMP Roger. I treasure mine, Deke; it took me 6 years to get that back to even.

03 23 37 44 CC I couldn't copy that, Walt.

03 23 37 46 LMP Remind Deke it took 6 years to get that question back to him.

03 23 37 52 CC Roger.

03 23 37 56 LMP It's almost sixth anniversary.

03 23 38 46 CC Apollo 7, Houston. One minute LOS Bermuda; we'll pick you up at Canary at 95 plus 46.

That was a real good tour of your castle there.

03 23 38 57 CDR Very good.

03 23 38 58 CMP Roger. Welcome aboard.

03 23 39 01 LMP Hey, Jack, does that go out live?

03 23 39 02 CC That went out live.

03 23 39 09 CMP Is Deke Slayton out of the press conference now?

03 23 39 29 CC Deke isn't here right now, Donn, but Harriet's in the Control Room and watches all.

03 23 39 36 CDR Roger. Very good. (Laughter)

03 23 39 41 CMP Roger. Understand. Tell her hello for me.

03 23 39 47 CC You just did; she's nodding her head.

03 23 39 50 CMP Okay.

CANYAR (REV 61)

03 23 46 20 CC Apollo 7, Houston through Canary.

03 23 47 36 CC Apollo 7, Houston.

03 23 47 43 LMP Go ahead, Houston.
Roger. You're 1 minute LOS Canaries; Tananarive 96 plus 01. And, Walt, when you get the evaporator reserviced, you can put it back on the line and put the switch in AUTO.

Okay. I'll give it 2 minutes of water now.
TANANARIVE (REV 61)

04 00 03 44  CC  Apollo 7, Houston through Tananarive.
04 00 04 21  CC  Apollo 7, Houston through Tananarive. Standing by.
04 00 04 24  SC  Houston, Apollo 7.
04 00 04 29  CDR  Houston, Apollo 7. Do you read?
04 00 04 30  CC  Read you five-by. We're standing by here.
04 00 04 33  CDR  Roger. Think we better knock this run off here and calculate the amount of fuel usage.
04 00 04 38  CDR  We've got over 3 hours in the bank of this test which is a lot better ... I expected.
04 00 04 46  CC  Wally, we are not reading COMM very well through Tananarive here.
04 00 04 54  CDR  We are terminating this test.
04 00 05 18  CDR  Houston, how do you read? Apollo 7.
04 00 05 22  CC  Okay, Apollo 7. Houston.
04 00 05 25  CDR  Roger. We've terminated the evaporator test.
04 00 05 29  CC  Wally, we have been monitoring the fuel usage very closely. They find the fuel usage is nominal for this test. We would like to continue the test and use the secondary evaporator if required to lower the EVAP OUT temperature.
04 00 05 55  CC  COMM is very bad here over Tananarive; we will have a real good pass with you through Carnarvon.
04 00 06 05  LMP  Roger. The primary evaporator is working fine again.
04 00 06 11  CC  Okay. Copy that, Walt.
04 00 10 22 CC Apollo 7, Houston. We're 1 minute LOS Taurus-side. We'll pick up ARIA 1 in about 2 minutes.
Monitor you there through Carnarvon.
04 00 10 33 CMP Roger. We'll continue with the transmit.
04 00 10 37 CC Roger. Copy.
04 00 10 51 CMP Hey, Jack, this is Walt. Give me 30 clicks on the water gun in the last 3 hours.
04 00 10 57 CC How many clicks, Walt?
04 00 10 59 CMP Thirty.
04 00 11 00 CC Roger. Thirty clicks.
04 00 11 02 CMP And CDR: 25.
04 00 11 05 CC Twenty-five to CDR.
04 00 11 07 CMP Thirty for CMP.
04 00 11 10 CC Thirty for CMP.

ARIA 1 (REV 61)

04 00 11 11 CC ARIA 1. Go REMOTE.
04 00 11 59 LMP Houston, Apollo 7. Stand by.
04 00 15 22 CC Apollo 7, Houston through ARIA.
04 00 16 04 CC Apollo 7, Houston through ARIA. Standing by.
04 00 18 38 CT ARIA 1, AOS. You may lock.
04 00 18 44 CC Apollo 7, Houston through ARIA.
04 00 19 05 CC Apollo 7, Houston through ARIA.
CARNARVON (REV 61)

04 00 19 50 CC Apollo 7, Houston through Carnarvon.
04 00 19 57 CMP Houston, Apollo 7. How do you read?
04 00 19 59  CC  You're reading — I'm reading you five-by, and I have your block data number 11 whenever you're ready to copy.

04 00 20 09  CMP  Roger. Stand by for the copy. Jack, on the Hasselblad magazines: now they have the modified slide in it, and it's possible to take pictures with the slide still in place on the back. I think we'd probably be better off with a safety on those. We just got through taking four pictures with the back in place and wasted — Slide.

— slide in place, excuse me, and we wasted four shots there, and probably three or four other ones through the flight at random.

04 00 20 35  CDR  Okay. I copy that, Walt.

04 00 20 36  CMP  Jack, go ahead with your updates.

04 00 21 27  CMP  Roger. Block data 11: 063 dash 4 A plus 305 minus 1599 099 plus 36 plus 59 3402, 064 dash 4 A plus 309 minus 1600 101 plus 13 plus 24 3578, 065 dash 4 A plus 269 minus 1600 102 plus 46 plus 04 2888, 066 dash 3 A plus 309 plus 1363 104 plus 04 plus 38 3403 plus, 067 dash 3 A plus 306 plus 1362 105 plus 41 plus 04 3607, 068 dash 3 Baker plus 261 plus 13 17 plus 13 plus 10 2888.

04 00 21 32  CC  Roger. That's complete, your block update, Jack? affirmative.

04 00 23 34  CMP

04 00 24 37  CC
04 00 24 39  CMP  A readback as follows. Did you start with 62 or 63?
04 00 24 49  CC  063 dash 4 A.
04 00 24 52  CMP  You're 063 dash 4 A plus 305 minus 1599 099
                  3659 3402, 063 dash 4 A plus 309 minus 1600
                  101 13 24 3578, 065 dash 4 A plus 269 minus
                  1600 102 46 04 2888, 066 dash 3 Alfa plus 309
                  plus 1363 104 04 38 3403, 067 dash 3 Alfa plus
                  306 plus 1362 105 41 04 3607, 068 dash 3 Bravo
                  plus 261 plus 1348 107 13 10 2888.
04 00 25 59  CC  Roger. That's correct.
04 00 26 23  CC  Apollo 7, Houston. Did you purge 02?
04 00 26 29  CMP  I purged 02 at the regular scheduled time, which
                  was several hours ago, I think. Wasn't it?
04 00 26 35  CC  Roger. We copy.
04 00 26 37  CMP  Check the time on that, will you, Jack?
04 00 26 40  CC  Roger. That should have been at 94 hours.
04 00 26 44  CMP  That's right; we purged at 94 hours.
04 00 26 47  CC  Okay. Thank you.
04 00 26 49  CDR  We're going through a meal now and probably have
                  a gripe. The cracker-type food, chicken sand-
                  wiches: they are all crumbly, and we have a
                  lot of problem with crumbs all over the cockpit.
                  We have been rejecting a lot of this.
04 00 27 10  CC  Okay. Wally, we copy that. You are about 1 min-
                  ute LOS Carnarvon, and we won't get you again
till Hawaii at 96 plus 45.
04 00 27 26  CDR  Roger.

HAWAII through BERMUDA (REV 61)

04 00 45 30  CC  Apollo 7, Houston through Hawaii.

04 00 45 38  CMP  We've completed all our data recording through
you. Are you going to be dumping that tape now?

04 00 45 49  CC  Apollo 7, Houston. We are going to rewind the
tape here. We will dump it over the States.

04 00 45 56  CMP  Roger. And can we secure this test?

04 00 46 03  CDR  We will continue for 30 more minutes.

04 00 46 06  CC  Okay. We are going to secure at 97 hours, Wally.

04 00 46 09  CDR  Roger.

04 00 47 45  CDR  Jack, this is Wally.

04 00 47 47  CC  Go ahead.

04 00 47 49  CDR  This is really a thrilling flight control task.
One slow roll in an hour and a half.

04 00 47 56  CC  (Laughter) Roger. Copy that.

04 00 51 10  CC  Apollo 7, Houston.

04 00 51 16  CMP  Say again.

04 00 51 16  CC  Walt, I have this daylight scanning telescope
star count PAD to give you whenever you are
ready to copy.

04 00 52 01  CMP  Okay. It's the daylight scanning telescope star
count or the sextant star count, Jack?

04 00 52 16  CDR  Jack, how much fuel did we blow on that one that
is impossible to use?

04 00 52 27  CDR  Houston, Apollo 7.
We will give you a hack on your fuel use on this - the fuel usage we have copied so far has been between 17 and 18 pounds, which is right on the nominal for this test.

Jack, I'm ready to copy the update chart.

Houston, Apollo 7.

Okay. Walt, stand by one.

Jack, on some of these ... let's assume we've learned something up here in 5 days that somebody else hasn't learned yet.

Say again, Wally. I missed that.

Let's assume we have learned something up here in the last 5 days that we didn't know before we came up.

Okay. I have this daylight star count PAD to pass up.

Okay. We will take it.

Okay. GET of sunrise 98 plus 15, roll 000, pitch 097, yaw 000. GET of sunset minus 12 98 plus 56, roll 000, pitch 327, yaw 000. Your T align will be 98 plus 15, and the only remark —

Do we have to do this T align for these angles? We have a REGISTER now.

Roger. The T align is for those angles, and the other change on this is that the shaft will be 90 degrees and a trunnion of zero degrees.
04 00 56 02  IMP  Okay. Zero shaft 90. Donn has got something to report.

04 00 56 10  CMP  Jack, we did this test a couple of days ago with a 120-degrees angle up, and I just didn't see much point in it. Your ability to see stars is not so much the function of light transmission of the telescope as it is a matter of stray light you got coming in from loose particles flying around outside that look like stars and also in stray light that comes up from the earth and whatnot, distorting the telescope picture. Jack, the point is I don't think you are going to learn a lot from this. We know already that the stars aren't all the same, aren't all the same ...

04 00 56 55  CC  Okay. Donn, we've got real poor COMM. I can't quite copy. Let's wait until we get over the coast, and we will have a little better COMM.

04 00 57 03  CMP  Roger. Copy.

04 01 00 01  CC  Apollo 7, Houston.

04 01 00 05  CDR  Go ahead.

04 01 00 06  CC  Roger. Appears to us that the evaporator might be drying out again.

04 01 00 11  CDR  Darn right.

04 01 00 19  CDR  Jack, I've been trying to tell you that with realignment we lose fuel, get into a new attitude, fly at two different attitudes to prove
what we have already discovered in this flight:
that you can't see stars in the telescope except
just after sunrise ... or just after ... sunset
which we have been trying to tell the Project
Office for about 5 years.

Roger. Copy that. Wally, this test here has
the telescope sunlight of sight at 70 degrees,
which is the worst case, and we would kind of
like to get this one in.

That's what I've been trying to tell you. With
the best case, we didn't do any good. If you
want us to do the test, all right; we will do
it, but we are kind of tired of arguing with
people who tell us to do this. I'm not talking
about you, but the various things you don't
know about telescopes.

It's a quarter after 12 00, Cape time.

Houston, is the radiator degradation test over
yet?

Apollo 7, Houston. You can discontinue the
radiator degradation test.

Roger.

You appear wide open from here today.

Go ahead, Apollo 7.

Roger. You look like you are pretty wide open
on weather today.
That's affirmative.
We remember last time. Over.

HAWAII through BERMUDA (REB 62)
Apollo 7, Houston.
Go ahead, Jack.
Donn, while you are taking photographs during either this stateside pass or the next one, if you can fit it in, we would like to get a picture of Tucson and a picture of a tropical storm which is presently just south of Cuba.

Understand. Tucson and a storm south of Cuba.
Roger. Tropical storm Gladys just south of Cuba.

Which end, Jack? South of Haiti or south of the ...?

If you could give us latitude and longitude, that would help us.
Stand by, Wally.
Okay. Wally, the present position of this storm is south of the eastern tip of Cuba and east-western tip of Cuba and east of the Yucatan Peninsula.

... up through the Cuban Islands? Okay. We got a pretty good fix on it. It will be on the next two passes, and we should get a cut of it.
Next pass, it looks like you would be in a little better position; it looks like you might even pass right over it.

Jack, this is Donn. Would you log me ten clicks on the water gun?

Roger. Copy that.

Give Walt 15 clicks.

Fifteen for Walt.

And Schirra will take 20.

Okay.

Apollo 7, we show you are approaching Guaymas LOS.

That's what you call skirting the issue, just going by the edge.

Roger.

Jack, on that Tucson-Phoenix, did you want the Pan-X or the 121?

Stand by.

We'll get you that by the next pass.

Roger. Plenty of time.

Jack, on that tropical storm coming up there: do you expect that to come up into the Gulf of Mexico?

Right now, the forecast that is past, it is up into the west coast of Florida.

I see.
<table>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>04 01 09 15</td>
<td>CMP</td>
<td>Jack, on that pass, would you log the following pictures, magazine 8? Starting down around about 55, I got two good pictures of Houston, two of New Orleans, Mobile Bay, Pensacola. Wally got the Mississippi Delta, the Fort Walter area, and that was about it. The Cape was cloudy, patchy, broken.</td>
</tr>
<tr>
<td>04 01 09 41</td>
<td>CC</td>
<td>Okay. Copy that.</td>
</tr>
<tr>
<td>04 01 09 48</td>
<td>CDR</td>
<td>Jack, I would recommend to the next crew that they try to eliminate as much bite-size food; that's bothering all of us already.</td>
</tr>
<tr>
<td>04 01 10 00</td>
<td>CDR</td>
<td>Okay. We copy.</td>
</tr>
<tr>
<td>04 01 10 17</td>
<td>CDR</td>
<td>The hot one ...</td>
</tr>
<tr>
<td>04 01 10 27</td>
<td>CC</td>
<td>Okay. Copy. I think he - wait till I get my sheet out now.</td>
</tr>
<tr>
<td>04 01 11 08</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 01 11 34</td>
<td>CC</td>
<td>Apollo 7, Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 01 11 40</td>
<td>SC</td>
<td>Go ahead.</td>
</tr>
</tbody>
</table>
| 04 01 11 42 | CC  | Apollo 7, Houston. Regarding this daylight scanning telescope start count: we're not going to be able to do it with the present REFSTMAT because of a gimbal lock problem. We understood yesterday that we saw more stars than we anticipated at the 120-degree line of sight, and we
would like very much to get this test in at the 70-degree line of sight. Over.

Apollo 7, Apollo 7, Houston. Did you copy?

Yes, we read you.

ASCENSION (REV 62)

Apollo 7, Houston through Ascension.

Roger.

Roger. You are five-by. Could you copy our conversation on the scanning telescope star count that we were giving you over Bermuda?

I got you. Roger, Jack.

Okay.

I've got some information for you. In minimum impulse and roll, if the stick is released, it will fire a jet in the opposite direction exactly as in the simulator.

Could you go over that again, please?

Okay. In pulse mode, minimum impulse —

Roger.

— if one pulse is entered — say roll right — the stick is released and brought to neutral; it will cross neutral and roll left one pulse.

Roger. Copy that.

It's the same as the sticks in the simulator; it's not unique.
04 01 24 06  CC  Okay. The other thing we wanted to ask you to
do: you could do the H₂ stratification test
whenever you can fit it in there.

04 01 24 18  CDR  Roger. Thank you. That's inside the next
half hour.

04 01 24 22  CC  Okay. We'd like you to put your tape recorder
forward switch to FORWARD.

04 01 24 29  IMP  Roger. Are you through dumping?

04 01 24 31  CC  Affirmative.

04 01 24 34  IMP  It is in FORWARD.

04 01 24 36  CC  Okay. The other thing we'd like to get is the
general crew status with a status on each man.
Could you give us kind of a complete rundown on
each man, how they're feeling today?

04 01 24 59  CDR  This is CDR. I still have a rather thick mucous
nose cold, but none of us are coughing. We're
very well rested although last night was rather
a short night; and we'll take advantage of the
longer hours tonight to catch up again. We've
all had plenty to eat and to drink, if not too
much. The sight of the food is just too rich
for us. I'm still on aspirin, and I'm off Actifed
at this time, and all of us are getting out
of Actifed. We don't have enough left to keep
taking it for the length of the mission. We'll
use it prior to reentry.
This is the CMP. My only complaint is a head cold, just like Wally. I find that my ears plug up now and then. I would take the Actifed except for running out, and I want to save it for reentry in case we need it then. Other than that, I'm in good shape. I've had plenty to eat and drink, had plenty of sleep. No problems.

Are you still reading, Jack?

Roger.

Okay. I'm in good shape. I've been sleeping a little better every night, and my ears are just barely clear some mornings and sometimes not. I don't feel bad; I don't feel like I have a cold. I just feel like I'm pretty well stuffed up and on the verge of getting one.

Okay. Copied that.

Apollo 7, have any of you had indications of a temperature rise?

Negative.

Okay. Fine. Sometime - no hurry on it - you might give us a count on your medication remaining. We kind of lost track here.

Okay. We've been logging it and calling it down, Jim, if you haven't gotten a report on every bit of it. One interesting observation, with a head cold, the fluids do not flow down the throat
and cause any lung problems. It stays up in the sinuses. This is due to zero gravity, I'm sure.

Okay. Copy that.

Jack, this is Donn. I just did a daylight P52. How it happened, we rolled over so that we're staring up to the stars. I did P52 and picked a pair that worked, so I lucked out. It turns out that you can, in general, see stars in the sextant provided it's not too close to the sun and provided all the optics will pull them in for you, but of course, it's impossible to see anything through the telescope under these conditions.

Understand —

— by the stars I marked on explicitly. I assume they are right because the star difference angles was proper.

Okay. Real fine.

I wouldn't want to hang my hat on that if I were going to the moon, however.

Roger. Understand.

I'd like to make the point; he confirmed the two stars by the star angle difference, like four balls 1.

Okay.

And by the pick a pair.
04 01 28 35 CC Okay. Apollo 7, Houston. We show that one panel is still isolated, and we're about to lose you over Ascension. We'll pick you up at Tananarive here at 497 plus 38.

04 01 28 50 CDR Roger. That's a good call down there. Thank you.

TANANARIVE (REV 62)

04 01 38 50 CC Apollo 7, Houston through Tananarive.

04 01 38 55 IMP I read you, Jack.

04 01 39 00 CC Roger. We're standing by.

04 01 44 08 CC Apollo 7, Houston. One minute LOS Tananarive. We'll try ARIA 1 at 97 51; Carnarvon at 97 53.

04 01 44 20 IMP Roger.

ARIO 1 (REV 62)

04 01 47 01 CT ARIA 1, go REMOTE.

04 01 50 42 CT ARIA 1, go REMOTE.

04 01 51 39 CC Apollo 7, Houston through ARIA 1.

04 01 52 01 CC Apollo 7 - Apollo 7, Houston through ARIA 1. Over.

04 01 52 30 CT AOS, ARIA 1 AOS.

04 01 52 41 CC Apollo 7, Houston through ARIA 1.

CARNARVON (REV 62)

04 01 53 16 CC Apollo 7, Houston through Carnarvon.

04 01 53 21 IMP Roger. Jack, I tried to put the primary evaporator back on the line, and it didn't make it.

04 01 53 27 CC Okay. I was trying to reach you through ARIA 1 to do that S-band DTO for ARIA.
We didn't hear you.
Roger. I didn't hear you, either. On your question about the film over the stateside pass for the pictures of Tucson: the film to use is 80121.
Roger. Thank you.
Jack, out of curiosity, how many different kinds of S-band passes are there? I'll give you time to figure that one out.
7, it appears to be about 20 or 30 different types of modes and conditions for S-band communications tries here.
Roger.
Apollo 7, Houston. On the primary evaporator: did you reservice it before your attempts to put it back on the line?
Sure did. We serviced it over Canaries.
Okay. Copy.
Temperatures are even running pretty hot. Can you confirm that both of my radiator panels are flowing now with the individual temperatures, please?
7, both of your RAD panels look good.
Roger. Thank you.
Houston, Apollo 7.
Go ahead, 7.
I'll give you a medication count. There are three categories: Actifed, aspirin, and one more pill...

Apollo 7, I didn't - I copy that you are going to give us the quantity remaining of the three medications.

Negative; the quantity used per crewman.

Okay. Go ahead with the quantity used.

Roger. CDR: Actifed six, aspirin 17, Lomotil two; CMP: Actifed two, aspirin two.

Copy.

IMP: one Actifed.

Roger. Copy that. Thank you very much.

Roger.

Apollo 7, Houston. Thirty seconds LOS Carnarvon; a short pass at Guam at 98 07; Hawaii at 98 18.

Okay. ...

GUAM (REV 62)

Apollo 7, Houston through Guam.

Roger.

7, we haven't had a window status check in a while. How are they doing?

Roger. They're - why don't we give you a check the next daylight, Jack?

Okay. Real fine. And the other thing I was kind of curious about, Wally, can you hear the thruster - the RCS thrusters - fire?
<table>
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<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
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<tbody>
<tr>
<td>04 02 09 33</td>
<td>CDR</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>04 02 09 35</td>
<td>CC</td>
<td>Okay. Real fine.</td>
</tr>
<tr>
<td>04 02 09 37</td>
<td>CDR</td>
<td>Only when they light off; we can't hear them when they're burning.</td>
</tr>
<tr>
<td>04 02 09 41</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 02 09 44</td>
<td>CDR</td>
<td>Right now, the main thing is you can hear a pulse. It sounds like your hearing - as Donn describes it - a water barrel, a thump, a clunk.</td>
</tr>
<tr>
<td>04 02 09 53</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>04 02 10 09</td>
<td>CDR</td>
<td>However, the thing seems to have almost a surge of power. It fluctuates back and forth on a sort of a cyclic beat, rather than a steady, smooth application of power.</td>
</tr>
<tr>
<td>04 02 10 26</td>
<td>CC</td>
<td>Okay. Copy. We're about 40 seconds from LOS Guam; Hawaii at 98 18.</td>
</tr>
<tr>
<td>04 02 10 34</td>
<td>CDR</td>
<td>Roger. You might pass that description down to John Healy.</td>
</tr>
<tr>
<td>04 02 10 39</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 02 19 47</td>
<td>CC</td>
<td>HAWAII (REV 62)</td>
</tr>
<tr>
<td>04 02 19 47</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 02 19 50</td>
<td>CDR</td>
<td>Roger. That set of angles was very good this time. We found the moon right in the middle of the telescope.</td>
</tr>
<tr>
<td>04 02 19 58</td>
<td>CC</td>
<td>Roger. Copy. We would like to send you up a HAV load, and I'm ready with a HAV check when you're ready to copy. Would you go to ACCEPT??</td>
</tr>
</tbody>
</table>
04 02 20 20  CDR  Okay on the NAV check.
04 02 20 22  CC  Okay. Coming up. The NAV check as follows: 102 plus 30 plus 0000 minus 1154 plus 06596 1522.
04 02 20 50  LMP  Roger. Readback as follows: 102 30 four balls minus 1154 plus 06596 1522. Over.
04 02 21 00  CC  That's correct.
04 02 21 05  CDR  Jack, did you get the impact of the moon being in the telescope?
04 02 21 09  CC  Roger. We're discussing that now.
04 02 21 11  CDR  Yes, you don't count stars when you look at the moon.
04 02 21 17  CC  Roger. We're scratching our heads.
04 02 21 19  CDR  And it's inertial like we are.
04 02 21 31  CC  Apollo 7, Houston. The load is in; we're finished; the computer is yours.
04 02 21 40  CDR  Roger.
04 02 22 30  CDR  Looks good enough to us.

Huntsville through ANTIGUA (Rev 62)

04 02 27 10  CT  Huntsville two-wheel lock; no ranging.
04 02 29 51  LMP  Houston, Apollo 7. We should be able to hack the star count on the next pass. The moon will not be in the next attitude.
04 02 29 59  CC  Roger. We copy.
04 02 31 10  CC  Apollo 7, Houston. We're all ready for the keying test.
<table>
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<tr>
<th>Time</th>
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<th>Message</th>
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<tr>
<td>04 02 31 19</td>
<td>IMP</td>
<td>Wait one on that keying test.</td>
</tr>
<tr>
<td>04 02 31 21</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 02 31 29</td>
<td>IMP</td>
<td>Okay. I'll go ahead and give you a keying test. We're coming up on a photo shortly.</td>
</tr>
<tr>
<td>04 02 31 36</td>
<td>CC</td>
<td>Roger, 7. Could you stand by one? We lost ...</td>
</tr>
<tr>
<td>04 02 31 40</td>
<td>IMP</td>
<td>Okay. I'll stand by.</td>
</tr>
<tr>
<td>04 02 32 31</td>
<td>IMP</td>
<td>Ready to go on the keying?</td>
</tr>
<tr>
<td>04 02 32 34</td>
<td>CC</td>
<td>Not yet. We're still standing by.</td>
</tr>
<tr>
<td>04 02 32 57</td>
<td>CC</td>
<td>Apollo 7, Houston. We're ready for the keying test.</td>
</tr>
<tr>
<td>04 02 34 03</td>
<td>IMP</td>
<td>Keying test over.</td>
</tr>
<tr>
<td>04 02 34 06</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 02 34 18</td>
<td>CC</td>
<td>Apollo 7, Houston. We are through with the keying test. You can reconfigure your spacecraft per the flight plan, and you only made two mistakes.</td>
</tr>
<tr>
<td>04 02 34 27</td>
<td>IMP</td>
<td>Yes, I put a couple of dits instead of dahs, didn't I?</td>
</tr>
<tr>
<td>04 02 34 30</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 02 34 33</td>
<td>IMP</td>
<td>Back to configuration.</td>
</tr>
<tr>
<td>04 02 34 35</td>
<td>CC</td>
<td>Okay. Copy.</td>
</tr>
</tbody>
</table>
04 02 37 42 CDR Last shot crossing States was 67, and Corpus
    Christi magazine 0.
04 02 37 49 CC  Okay. Copy that.
04 02 37 52 CDR We are crossing the Gulf now, looking for the
    storm.
04 02 38 04 CDR You might give us a MARK when you think we are
    adjacent to it.
04 02 38 08 CC  Okay. Will do, Wally. You got a little ways
    to go yet.
04 02 39 25 CDR Jack, that looks like one big white overcast
    about 12 o'clock.
04 02 39 29 CC  That should be it. The tropical storm will
    be south of your flight path here; your flight
    path should take you right over Cuba, and the
    tropical storm will be south of the western
    tip of Cuba.
04 02 39 43 CDR Okay.
04 02 39 45 CDR We'll take a strip going into it; I think that's
    the best bet.
04 02 39 48 CC  Okay.
04 02 40 23 LMP We've got one big stormy area out here, Jack.
    I don't pick up a characteristic tropical storm.
04 02 40 31 CC  Okay. Right now, the wind speeds are about
    45 knots. Tomorrow sometime, the winds are
    forecast to pick up to 70.
If it comes up in the Gulf, you can all go down and bail my boat out.

Roger. There are a few other people with the same problem.

Understand. They've got a better chance of getting to their boat than I have right now.

I think you're right.

I think that is part of the duties of the support crew; we'll take care of it, Wally.

I think ... Jack.

Jack, frame 68 was the cloud cover that - not really a storm I could discern.

Roger. Copy.

Could you get our rates down there, Jack?

Roger. Stand by.

Roger. That pitch rate now is not something I put in. It just comes from coupling with that little atmosphere of convective air.

Wally, right now, it looks like we've got a pitch rate of plus .3.

Roger. I don't really think we have anything to worry about on one or two pulses, and the spacecraft actually is torquing itself in pitch, that's all. It's costing us earlier on the radiator degradation test. We think it's just
the way it goes through an attitude at a certain
atmospheric affect, what little there is.

Okay.

That's a pretty good track of our attitude
there, and I had - oh, less than one pulse
in that direction in pitch, and you can see
what happened.

Okay. We'll get a little more accurate back
at it when we take a look at this strip chart.

Right. That's what I'd like to have you take
note of.

Okay.

Apollo 7, Houston. We'd like to have you turn
your O₂ fans tank 2 ON for 3 minutes.

Roger. ON.

I finished the hydrogen stratification test, and
it was about like the first one. There was a
slightly noticeable pressure decrease when I
turned the fans on, on the order of maybe 2 psi,
something like that, and it's stabilized out
right here.

Okay. Real fine, Walt.

Jack, note the pitch rate right now. It is
decreasing, yet I have not turned any pitch
pulses in, and there are no thrusters firing.
It's a good pass to make note of what we're
talking about.
Okay. We got it. We'll look at it real close.

Okay. There were no pitch pulses at that point.

We've been noting this all during the flight
and thought on this pass to get a record on it.
Note the pitch rate is decreasing all the time.

Okay. We'll really take a good look at it.

Okay. This is something we had a heck of a time
trying to explain to ourselves. It was pitching
in the right direction, so I wasn't going to take
it out. It's almost going to pitch zero.

There was no IVA during that either, by the way.

Okay. Copy that. It sounds like you got a
built-in ORB rate torquer there.

Yes. See there. It's almost zero-pitch. I
haven't done a thing to it. In fact, I've got
to do some more pitching to get up to the 326.

Roger. That's what we're looking -

... That's two more.

We knew what was heating us up during the
 radiator degradation test. We were going
through these kind of attitudes and had to work
to get through them.

Copy. We still were nominal on fuel during that
whole test.

Roger. Understand. But what we're telling you
is about like this. I put three pulses, and
it's back to zero again.
Roger. —

Hey, Jack, being nominal on that test implies that the three points were present. Donn and I — on numerous tries, the simulator ran well below the nominal fuel usage on that thing where there were no torques.

That's real fine information, Walt.

I put three more pulses in.

Houston, do you still read?

Roger. We are still reading you, Wally.

That's a zero again with no pulses.

You'll have some fun reading this one. Over.

Say again.

You'll have some fun reducing the data on this one.

We have people busy on it, and we are watching it right here.

That's it. We think it is kind of an interesting phenomenon. I'm back to zero again. ... The best exercise in rocketed direction ...

Two more pulses.

And it's back to zero again. ...

You might know it's not precise. Canary is much more precise than it is in a similar area.

Roger.
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<td>04 02 18 54</td>
<td>CDR</td>
<td>If you call I'll ... give it to you.</td>
</tr>
<tr>
<td>04 02 49 11</td>
<td>IMP</td>
<td>Well, I notice from the flight plan that 60 percent hydrogen test is nominally at 102 to 103 hours. Are we running pretty much nominal there or a little behind or what?</td>
</tr>
<tr>
<td>04 02 49 24</td>
<td>CC</td>
<td>We are about to lose you here over Antigua. We will pick you up at Ascension at 56.</td>
</tr>
<tr>
<td>04 02 56 46</td>
<td>CC</td>
<td>ASCENSION (REV 63) Apollo 7, Houston through Ascension.</td>
</tr>
<tr>
<td>04 02 57 59</td>
<td>CC</td>
<td>Apollo 7, Houston through Ascension.</td>
</tr>
<tr>
<td>04 02 58 06</td>
<td>CDR</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>04 02 58 07</td>
<td>CC</td>
<td>Okay. You're loud and clear. Wally, on this pitch rate: it would help us out a little bit - we could get a little bit more data - if you would put your GDC on FDL number 1.</td>
</tr>
<tr>
<td>04 02 58 19</td>
<td>CDR</td>
<td>What we had was right at 90 degrees. We're only locked into a deadband now, Jack. We're right about - pitched up at 090, straight up.</td>
</tr>
<tr>
<td>04 02 58 35</td>
<td>CC</td>
<td>Okay. Copy. We get better data on that pitch rate for - on telemetry if we can put the GDC on FDL number 1.</td>
</tr>
<tr>
<td>04 02 58 46</td>
<td>CDR</td>
<td>I see. Okay. Next time we see it, we'll do that.</td>
</tr>
<tr>
<td>04 02 58 50</td>
<td>CC</td>
<td>Okay, and -</td>
</tr>
</tbody>
</table>
| 04 02 58 56 | CDR | It appears that, apparently, we had the spacecraft pointed straight up, the command on the
I-axis this morning, away from the earth on the radial.

04 02 59 05 CC You say that's when it occurred, when the I-axis was pointed away from the earth?
04 02 59 09 CDR That's the way it was this time, and that's the way it seems to be in the past.
04 02 59 13 CC Okay. Real fine. That gives us a good clue.
04 02 59 15 SC It's not active now, CAP COMM?
04 02 59 18 CDR No. It's rotated around now.
04 02 59 22 CC Okay. Has it quit now, Wally?
04 02 59 26 CDR That's affirm. We're now about 140 degrees local vertical.
04 02 59 30 CC Okay. Real fine. And relative to Walt's question on the hydrogen usage, we figure you're about 1 pound above nominal.
04 02 59 42 LMP Roger. And we look like we are even better off with oxygen.
04 02 59 46 CC That's affirmative.
04 03 02 21 CC Apollo 7, Houston. One minute LOS Ascension; Tannarive at 99 plus 13.
04 03 02 28 LMP Roger. Jack, did the doctor ever say anything about using this antibiotic as a preventative medicine up here?
04 03 02 33 CC Stand by.
04 03 02 38 CC Okay. Walt, on that question: there is really not any need to use any of the antibiotic; they don't feel that would help or cure a cold.
Well, so far, I've been able to resist pretty much getting one, but Donn's coming down -- if there's some way I could hold it off, I would just as soon take the pill. Or do they just want me to go ahead and catch it, then treat it?

Okay. We'll pick you up over Tananarive.

Apollo 7, Houston through Tananarive.

Roger. Jack, --

You're five-by --

We're powered down in the drifting flight configuration.

Roger. Copy that. We'll be standing by.

We're going to activate the evaporator again ...

Apollo 7, Houston through Carnarvon.

Roger. Loud and clear.

Roger. Five-by. We've been going over some of the results of the keying test we did over the States. It leads us to two questions we would like to ask. One, was the LMP in AUXILIARY?

Negative.

And the next question, was the keying done with the panel switch or the mike button?

I keyed with the mike button on my control head.
04 03 29 55  CC  Okay. Thank you.
04 03 29 58  CDR  Jack, we have one for you.
04 03 30 00  CC  Go ahead.
04 03 30 02  CDR  Okay. We powered down, and just checking over my CAL's, it would appear that the SPS logic bus 3 switch might help. Does it?
04 03 30 14  CC  Would you say again? we didn't copy, Wally.
04 03 30 18  CDR  Okay. I said I've got the SPS powered down.
04 03 30 20  CC  Roger.
04 03 30 21  CDR  Does the SPS logic bus 3 save us any power?
04 03 30 27  CC  Okay. Stand by.
04 03 30 28  CDR  — when added to the rest?
04 03 30 33  CC  Okay. Stand by. We'll get you the answer.
04 03 30 46  CDR  Roger. Log 15 clicks of water for the CMP.
04 03 30 51  CC  Okay. Will do.
04 03 30 54  IMP  And, Jack, when you get a chance, can we get an update on the RCS profile I have on board?
04 03 31 04  CC  Okay. In work.
04 03 31 07  IMP  Thank you.
04 03 31 51  CC  Wait, your RCS reading on your plot will be 71°.
04 03 32 00  IMP  Roger. 71°.
04 03 32 36  CC  Apollo 7, could you get us some results of your scanning telescope test —
04 03 32 37  IMP  — when we operate the IMP on AUXILIARY, we seem to be ... a pretty good check on that, haven't we?
04 03 32 48  CC  I'm sorry, Walt, I was transmitting something to you at the same time. Can you say again?

04 03 32 54  LMP  Roger. We have, coming up over Carnarvon, FMP powered AUXILIARY with an S-band check. Have we already satisfied any of those by an earlier operation in AUXILIARY for some time?

04 03 33 18  LMP  I guess I'm asking do you want to continue that test; should I plan on FMP AUXILIARY; and what were you saying when I transmitted?

04 03 33 27  CC  Okay. Walt, we do want to put the FMP to AUXILIARY. That puts us in our PCM down on the FM.

04 03 33 38  CC  Put your —

04 03 33 40  LMP  ... a long time early in the flight like that?

04 03 33 58  CC  Walt, we'll hit you at Guam at 99 plus 39 and Hawaii at 99 plus 53.

04 03 34 07  LMP  Okay. And give me a call if you want FMP powered AUXILIARY.

04 03 34 12  CC  Roger. We want the FMP on AUXILIARY. That's just the configuration for the test.

GUAM (REV 63)

04 03 39 46  CC  Apollo 7, Houston through Guam.

04 03 39 57  CDR  Roger. I read you.

04 03 39 58  CC  Roger. Five-by. We would like you to put your FMP power to AUX.

04 03 40 06  SC  Roger. AUX ...
I didn't copy that last one. Say again.

Apollo 7, Houston. Looks like we're getting about two-by on the COMM here at Guam. After the COMM test at Hawaii, we would like to have you comment briefly on the results of the scanning telescopes star count.

Guam M and 0, Houston CAP COMM.

Apollo 7, Houston.

Roger. How do you read AUXILIARY FMP?

I read you five-by, Walt; and relative to Wally's question on a SCS logic bus, it will save us about 2 amps, and you can turn that switch off if you'd like.

Okay. We'll turn it off; it'll cool it down in here a little bit. It's been getting warm and stuffy.

Roger. Copy that.

You wouldn't believe the way we're eating today.

I bet I would.

When things get boring, we play IVA.

Roger. Copy that. You're 1 minute LOS Guam; Hawaii at 99 plus 53.

Roger.

HAWAII through TEXAS (REV 63)

Apollo 7, Houston through Hawaii.

Apollo 7, Houston through Hawaii.
Apollo 7, Houston through Hawaii.

Roger. Loud and clear. We just got ...

Okay. You're loud and clear here. Go ahead.

Number 2 window is in real good shape, but the perimeter—it's fogging around the perimeter particularly in the upper portion. About—oh, it's very thick ... about half an inch in from the perimeter and thins out to a perfectly good, clear window. The hatch window has never been usable since shortly after insertion into orbit. Large condensation inside now in the inner surface of the inner pane; and the center of the window, a circle about 5 inches in diameter, looks like snowflake crystals all across it; it's actually opaque.

Window number 4 ... fogging ... right around the edge, toward the inner surface of the inner pane—outer pane towards the minus 2 axes, primarily, including from the edge, and it's ... half inch in worst spots, but it's still a perfectly —

Okay. Apollo 7, Houston. We lost you on the handover there. We will pick you up with the last half of window 4 when we get good contact with the Huntsville.
04 04 00 14 CDR You got one through three?
04 04 00 16 CC Roger. We copy window 3. We got cut off just as you started to give us window 4.
04 04 00 26 CDR Roger. We just broke the century hour.
04 04 00 39 LMF Do you read, Houston?
04 04 00 40 CC Okay. Read you five-by. We are ready to copy window 4.
04 04 00 45 LMF Okay. Did you hear Wally's remark? We just broke 100 hours.
04 04 00 50 CC Roger. We got that.
04 04 00 53 LMF Okay. Window number 4 has started to occlude. It's on the edge and working its way inward.
04 04 01 10 CC Okay. Three-eighths to one-half --
04 04 01 13 CDR Okay ... photography. The window number 5 starting to get some kind of a film on the inner surface of the outer pane, but you have to look pretty close to see it. It is still perfectly visible for photography.
04 04 01 34 LMF Okay. Windows 2 and 4 are sufficient for star work, but the other ones are not.
04 04 01 41 CC Okay. Copy that.
04 04 01 47 CDR Jack, yesterday was the fifth anniversary of the entry of D. Eisele and W. Cunningham into this program.
04 04 01 58 CC We copy that anniversary.
<table>
<thead>
<tr>
<th>Time</th>
<th>Cdr</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 04 02 04</td>
<td>IMP</td>
<td>Is it safe for champagne?</td>
</tr>
<tr>
<td>04 04 02 09</td>
<td>CC</td>
<td>Say again.</td>
</tr>
<tr>
<td>04 04 02 12</td>
<td>CDR</td>
<td>...</td>
</tr>
<tr>
<td>04 04 02 16</td>
<td>CC</td>
<td>We didn't copy that, Wally. Could you give us window number 1 again?</td>
</tr>
<tr>
<td>04 04 02 23</td>
<td>CDR</td>
<td>I think the window is getting worse, clouding the vision due to the overboard dump. The particles depending on the spacecraft attitude seemed to bounce off it or collect on it.</td>
</tr>
<tr>
<td>04 04 02 42</td>
<td>CDR</td>
<td>Do you read?</td>
</tr>
<tr>
<td>04 04 02 43</td>
<td>CC</td>
<td>Okay. Got it.</td>
</tr>
<tr>
<td>04 04 02 46</td>
<td>CDR</td>
<td>My question was is Deke Slayton still in town?</td>
</tr>
<tr>
<td>04 04 02 51</td>
<td>CC</td>
<td>Okay. Our COMM with Huntsville is deteriorated. We're not reading you too well. We'll pick you up over the States.</td>
</tr>
<tr>
<td>04 04 02 58</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 04 05 52</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 04 05 55</td>
<td>CDR</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>04 04 05 56</td>
<td>CC</td>
<td>You're loud and clear, too. Would you get your PMP switch to NORMAL?</td>
</tr>
<tr>
<td>04 04 06 20</td>
<td>CC</td>
<td>And then we would like to have you configure for the relay mode.</td>
</tr>
<tr>
<td>04 04 06 24</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 04 07 01</td>
<td>CDR</td>
<td>Like to get a readout on the GRC versus CMC.</td>
</tr>
<tr>
<td>04 04 07 08</td>
<td>CC</td>
<td>Apollo 7, Houston. Are you configured for the relay test here at Guaymas?</td>
</tr>
<tr>
<td>Time</td>
<td>Code</td>
<td>Text</td>
</tr>
<tr>
<td>-------</td>
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<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>04 04 07 13</td>
<td>IMP</td>
<td>Apollo 7, do you read?</td>
</tr>
<tr>
<td>04 04 07 17</td>
<td>CC</td>
<td>Roger. Apollo 7, do you read? Houston.</td>
</tr>
<tr>
<td>04 04 07 25</td>
<td>IMP</td>
<td>Houston, Apollo 7. Over.</td>
</tr>
<tr>
<td>04 04 07 30</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>04 04 07 42</td>
<td>IMP</td>
<td>We haven't configured yet, Houston.</td>
</tr>
<tr>
<td>04 04 07 46</td>
<td>CC</td>
<td>Roger. Copy. I understand you have not configured for the relay test.</td>
</tr>
<tr>
<td>04 04 07 49</td>
<td>IMP</td>
<td>Roger. I haven't had the cue yet.</td>
</tr>
<tr>
<td>04 04 07 53</td>
<td>CC</td>
<td>Okay. Would you put your PMP power switch to NORMAL and configure for the relay test.</td>
</tr>
<tr>
<td>04 04 07 58</td>
<td>IMP</td>
<td>Roger. Configured.</td>
</tr>
</tbody>
</table>

**Hawaii through Texas (Rev 6a)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 04 08 00</td>
<td>CDR</td>
<td>Power PMP NORMAL and is configured for relay test. I ran out of it in order to get the contact with you again. I'm at Duplex A now and configured to relay.</td>
</tr>
<tr>
<td>04 04 08 09</td>
<td>CC</td>
<td>Roger. I understand, Apollo 7. You're configured for relay test. We're not performing the relay test.</td>
</tr>
<tr>
<td>04 04 08 35</td>
<td>CC</td>
<td>Roger. Apollo 7, Houston. Counting one, two, three, four, five - five, four, three, two, one. Performing the relay test.</td>
</tr>
<tr>
<td>04 04 09 10</td>
<td>CC</td>
<td>Houston performing the relay test - one, two, three, four, five - five, four, three, two, one.</td>
</tr>
</tbody>
</table>
04 04 10 22  CC  This is Houston performing the relay test. One, two, three, four, five, six, seven, eight, nine, nine, eight, seven, six, five, four, three, two, one.

04 04 11 44  CC  Apollo 7, Houston.

04 04 11 46  LMP  Roger. We copied your RELAY mode check. How did it work?

04 04 11 50  CC  Well, there is some question on it. Can you confirm that you were in the RELAY mode per your COMM slide rule?

04 04 11 57  CDR  That's affirmative.

04 04 11 59  CC  Okay. Fine. Thank you.

04 04 12 03  LMP  Did it work, or did it not?

04 04 12 07  CC  Ground didn't copy the relay so we had some question there.

04 04 12 10  CDR  Roger. We read you.

04 04 13 11  LMP  Magazine 8 frame 69: west coast of Southern Mexico.

04 04 13 18  CC  Okay. Copy that.

04 04 18 21  CC  Apollo 7, Houston.

04 04 18 59  CC  Apollo 7, Houston.

04 04 50 02  CC  Apollo 7, Houston.

04 04 50 27  CC  Apollo 7, Houston.

04 04 51 16  CC  Apollo 7, Houston.
04 04 51 44 CC Apollo 7, Houston. Transmitting in the blind. We're trying to find a piece of the data for the radiator degradation test around 96 hours. This was when we were considering terminating the test, and Walt, can you confirm tape recorder ON at that time?

04 04 52 33 LMP Apollo 7. Stand by.

04 04 52 41 CT Tamanarive M and O. They rogered, Houston CAP COMM.

04 04 52 50 LMP ... right on the minute.

04 04 52 55 CC Roger. Understand you did have it on. Thank you.

04 04 52 59 LMP That's affirmative.

04 04 53 23 CC Apollo 7, Houston. One minute LOS; Mercury at 11.

MERCURY (REV 64)

04 05 11 52 CC Apollo 7, Houston, Mercury. Standing by.

04 05 11 57 CDR Roger.

04 05 11 59 LMP Say, Ron, I wanted to confirm that we rechecked our switches for the RELAY mode, and everything was configured appropriately. We have --

04 05 12 20 CC Apollo 7, Houston.

04 05 12 26 LMP Do you read, Ron?

04 05 12 27 CC I missed part of your comments there, but the RELAY mode worked okay.

04 05 12 33 LMP Oh, it did work okay? Jack indicated that it wasn't conclusive.

04 05 12 40 CC No, that was our mistake; it worked okay.
04 05 12 44 IMP Okay. And I understand we have the same check coming up in a couple of hours?

04 05 12 53 CC Say again. What check?

04 05 12 55 IMP We have the same thing coming up for another check over Hawaii in a couple of hours, and I wanted to confirm that we did turn on the tape recorder for all those data points. And one of them - we were 3 or 4 minutes late on the radiator test, but the one in question that you asked about I believe we turned on right on the dot.

04 05 13 15 CC Okay. Roger. Thank you.

GUAM (REV 6A)

Apollo 7, Houston. Opposite omni.

04 05 14 46 CC We're on the frame 75 magazine ... 0. Orion at sunrise. Props by Eisele.

04 05 15 46 CDR Say again, Wally. Not too clear there.

04 05 16 00 CC Frame 75 magazine negative ... 0, Sierra ... constellation Orion at sunrise. Props by Eisele.

04 05 16 08 CDR Roger. Copy.

HAWAII (REV 6A)

04 05 16 22 CC Apollo 7, Houston. One line flight plan update.

04 05 29 26 CC Go ahead.

04 05 29 37 CDR Roger. At 102 plus 20, delete CRYPTO test at this time.
04 05 29 51  CDR  Roger. We did it earlier at 50 percent.
04 05 29 55  CC   Roger. We're estimating 60 - you'll have about
                   60 percent O₂ at about 13½ hours, something like
                   that. We'll update later on.
04 05 30 06  CDR  Roger. The O₂ will be done later, you mean?
04 05 30 08  CC   That's affirmative.
04 05 30 10  IMP  Hey, Ron, we can just have a standing flight
                   plan item on that. It's supposed to be done
                   at 60 percent, so we'll just do it when it gets
                   to 60 plus or minus 5.
04 05 30 19  CC   Sounds good.
04 05 30 25  CDR  Can we have a chart update too, Ron?
04 05 30 29  CC   Say again.
04 05 30 32  CDR  A chart update.
04 05 30 35  CC   Wilco. Stand by.
04 05 31 29  CC   Apollo 7, Houston. I have your map update.
04 05 31 34  CDR  Go ahead.
04 05 31 35  CC   Roger. REEV 64, GET 101 plus 06 plus 52,
                   longitude 106.8 east, right ascension 04 plus
                   54.
04 05 31 59  CDR  Roger. Thank you.
04 05 32 57  CC   Apollo 7, Houston. We found the data in question
                   on the RAD test.
04 05 33 03  IMP  Roger. Thank you.
                   HUNTSVILLE (REV 64)
04 05 34 37  CT   Huntsville. Two-way lock signal too weak for
                   valid range.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 05 34 53</td>
<td>CT</td>
<td>Huntsville. Two-way lock. Valid range.</td>
</tr>
<tr>
<td>04 05 38 48</td>
<td>IMP</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>04 05 38 50</td>
<td>CC</td>
<td>Houston. Go.</td>
</tr>
<tr>
<td>04 05 38 52</td>
<td>IMP</td>
<td>Roger. Log the CMP 15 clicks on the water gun; the IMP, 30 clicks.</td>
</tr>
<tr>
<td>04 05 39 03</td>
<td>CC</td>
<td>Awful garbled, Walt. Say again.</td>
</tr>
<tr>
<td>04 05 39 08</td>
<td>IMP</td>
<td>Roger. Give the CMP 15 clicks on the water gun and the IMP 30 clicks.</td>
</tr>
<tr>
<td>04 05 39 17</td>
<td>CC</td>
<td>I can't read you here. We'll pick that - pick you up in Guaymas in about 2 minutes.</td>
</tr>
<tr>
<td>04 05 40 08</td>
<td>CC</td>
<td>Apollo 7, Houston. Say again your last translation now.</td>
</tr>
<tr>
<td>04 05 40 13</td>
<td>IMP</td>
<td>Roger. Ron, I was just logging some water; 15 clicks for IMP and 30 clicks for the - excuse me, 15 clicks for the CMP and 30 clicks for the IMP.</td>
</tr>
<tr>
<td>04 05 40 26</td>
<td>CC</td>
<td>Roger. Thank you.</td>
</tr>
<tr>
<td>04 05 42 59</td>
<td>CC</td>
<td>Thirty seconds LOS; Tananarive at 20.</td>
</tr>
<tr>
<td>04 06 21 15</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive. Standing by.</td>
</tr>
<tr>
<td>04 06 27 46</td>
<td>CC</td>
<td>Apollo 7, Houston. Two minutes to LOS Tananarive; Mercury at 43.</td>
</tr>
</tbody>
</table>
04 06 44 26  CC  Apollo 7, Houston, Mercury. Standing by.
04 06 44 30  CDR  Roger. Loud and clear.
04 06 44 32  CC  Roger. The same.
04 06 45 57  CDR  Houston, Apollo 7.
04 06 45 58  CC  Houston. Go.
04 06 46 00  CDR  Roger. You can give Walt credit for 12 clicks of water and give me 30.
04 06 46 08  CC  Wilco.
04 06 46 10  CDR  And the water's tasting very good, so we'll chlorinate one more time and see how bad it gets, and that may be the last dose.
04 06 46 19  CC  I understand what you're saying.
04 06 46 22  CDR  Okay. Thank you.
04 06 46 31  CC  Apollo 7, Houston.
04 06 46 51  CDR  ... and see where we stand.
04 06 47 04  CC  Apollo 7, Houston. You're unreadable.
04 06 47 08  CDR  We predict that we should chlorinate every other day so we'll see how that works out.
04 06 47 18  IMP  Is Hawaii in the RELAY mode?
04 06 47 22  CC  Walt, that's affirmative. Configure for RELAY mode prior to 103 plus 02.
04 06 47 31  IMP  Wilco. Okay. We'll be on Duplex A as we go over the hill now.
04 06 47 37  CC  Affirmative. And Walt, we'd like you to cycle 02 tank 2 fans ON for 5 minutes, then OFF.
Then what?
Apollo 7, Houston. Opposite omni.
Ron, we just made a big discovery. I just
turned the $O_2$ fan number 2 down ON, and it
started our DET in the lower equipment bay.
Beautiful.
Did you read that?
Affirmative. DET in the LEB started when you
turned the fans on.
That's correct.
Always excitement up here. That lends credence
to the theory that it does touch the spacecraft.
Say your last comment, Wally.
That lends credence to the theory that the fans
do pulse the spacecraft.
Roger. We - we'll read it back on the tape. I
still didn't get you.
Apollo 7, Houston.
Go ahead.
Opposite omni.
Apollo 7, Houston. Thirty seconds LOS; Hawaii
at 02.
Roger.
HAWAII (REV 65)
Apollo 7, Houston.
Roger. We read you five square.
04 07 02 29    CC    Roger. You're a little weak.
04 07 02 38    CC    Apollo 7, Houston. Would you like to try it again? How do you read?
04 07 03 05    CC    Apollo 7, Houston.
04 07 03 15    CC    Apollo 7, Houston.
04 07 03 20    CDR   Roger.
04 07 03 23    CC    Roger. You're not coming back very well.
04 07 03 40    CC    Break Hawaii M and O. S-band uplink inhibit.
04 07 04 31    CC    Apollo 7, Houston for a backup voice check.
04 07 04 31    CC    I'm transmitting up to you on 259.7. You should be transmitting my voice back down to Hawaii USB link.
04 07 05 11    CC    Apollo 7, Houston CAP COMM transmitting for a voice RELAY mode. Transmitting up to you on 259.7. My voice should be coming back through the spacecraft and back down to Hawaii on the USB.
04 07 05 11    CC    Apollo 7, Houston. Request up-telemetry COMMAND to RESET momentarily and then NORMAL at LOS.
04 07 05 21    CDR   Roger. Do you read, Ron?
04 07 05 23    CC    Affirmative. Loud and clear now.
04 07 05 25    CDR   Okay. You're transmitting okay. Did you get a relay check?
04 07 05 31    CC    I still haven't got a reading here yet. I think it's okay.
04 07 05 34    CDR   Okay. We heard you. I'll call. Hello, this is Wally. Hello, this is Wally.
04 07 05 43  CC  Go ahead.
04 07 05 44  CDR  Did you call it a CONSAT?
04 07 05 50  CC  A time check?
04 07 05 52  CDR  No, did you call it a CONSAT?
04 07 06 00  CC  I can't understand. Say again, Wally.
04 07 06 03  CDR  Did you call it CONSAT?
04 07 06 06  CC  Roger. You are a CONSAT.
04 07 06 10  CDR  Roger.
04 07 06 13  CC  I'm a little dense.

HUNTSVILLE (REV 65)
04 07 09 05  CT  Huntsville two-way lock valid range.
04 07 09 13  CC  Apollo 7, Houston. One minute LOS break. Be
advised voice relay quality was good.
04 07 12 33  CC  Apollo 7, Houston. Tananarive at 54.

TANANARIVE (REV 66)
04 07 55 12  CC  Apollo 7, Houston through Tananarive. Standing
by.
04 07 56 55  CC  Apollo 7, Houston. Standing by.
04 07 58 15  CC  Apollo 7, Houston through Tananarive.
04 08 01 10  CC  Apollo 7, Houston, Tananarive. Mercury at 18.
04 08 02 20  CC  Apollo 7, Houston. No joy Tananarive; Mercury
at 18.

MERCURY (REV 66)
04 08 18 34  CC  Apollo 7, Houston through Mercury.
04 08 19 04  CC  Apollo 7, Houston.
04 08 19 46  CC  Apollo 7, Houston.
04 08 19 59 CC Mercury #1 and 0, Houston CAP COMM. Are we getting out to you?

04 08 20 38 CC Apollo 7, Houston.

04 08 21 14 CC Apollo 7, Houston. Transmitting in the blind.

04 08 23 18 CC Flight plan update at 106 plus 00, 02 fuel cell purge.

04 08 24 56 CC Apollo 7, Houston.

04 08 25 56 CC Apollo 7, Houston. LOS Mercury; Hawaii at 36.

HAWAII (REV 66)

04 08 36 42 CC Apollo 7, Houston through Hawaii.

04 08 37 23 CC Apollo 7, Houston through Hawaii.

04 08 37 47 CC Apollo 7, Houston.

04 08 38 09 CC Apollo 7, Houston.

04 08 38 47 CC Apollo 7, Houston.

04 08 38 49 IMP Roger. Houston, Apollo 7. Do you read me?

04 08 38 52 CC Roger. Read you loud and clear now.

04 08 38 56 IMP Okay. Did you try to contact us over Mercury?

04 08 38 59 CC Affirmative.

04 08 39 02 IMP Sorry about that. I didn’t get back in the right configuration after that real check.

04 08 39 07 CC Yes, we were switching around here and were going to try that in the air at Hawaii if we didn’t catch you. Okay. Walt, I’ve got a block data for you and also would like some onboard readouts.

04 08 40 02 CC Apollo 7, Houston. Do you read?
<table>
<thead>
<tr>
<th>Time</th>
<th>CC/IMP</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 08 40 29</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 08 40 59</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 08 41 42</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 08 41 49</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 08 42 17</td>
<td>CC</td>
<td>Apollo 7, Houston. We'll pick you up in the Mercury at 104 - delay that, at 105 52.</td>
</tr>
<tr>
<td>04 09 52 45</td>
<td>CC</td>
<td>Apollo 7, Houston through Mercury.</td>
</tr>
<tr>
<td>04 09 52 48</td>
<td>IMP</td>
<td>Roger. Load and clear.</td>
</tr>
<tr>
<td>04 09 52 51</td>
<td>CC</td>
<td>Roger. The same, Walt.</td>
</tr>
<tr>
<td>04 09 52 53</td>
<td>IMP</td>
<td>We're going to take the block data this pass?</td>
</tr>
<tr>
<td>04 09 52 57</td>
<td>CC</td>
<td>Roger. Block data to follow. 069 dash 3 Charlie plus 190 plus 1300 108 plus 47 plus 28 2888, 070 dash Alfa Charlie plus 043 minus 0230 109 plus 37 plus 43 4082, 071 dash Alfa Charlie plus 128 minus 0320 111 plus 10 plus 33 3808, 072 dash 2 Alfa plus 255 minus 0270 112 plus 48 plus 12 3484, 073 dash 1 Bravo plus 210 minus 0615 114 plus 13 plus 04 3590, 074 dash 1 Bravo plus 279 minus 0645 115 plus 48 plus 12 3455. Houston, over.</td>
</tr>
<tr>
<td>04 09 55 21</td>
<td>IMP</td>
<td>Roger. While I read that, could you get someone to check our main O2 rates?</td>
</tr>
<tr>
<td>04 09 55 29</td>
<td>CC</td>
<td>Roger. We're standing by.</td>
</tr>
<tr>
<td>04 09 55 32</td>
<td>IMP</td>
<td>Okay. Roger. This is Charlie 69 0693 Charlie plus 190 plus 1300 108 47 28 2888, 070 Alfa</td>
</tr>
</tbody>
</table>
Charlie plus 043 minus 230 109 3743 4082, 071
Alfa Charlie plus 128 minus 0320 111 plus 10
plus 33 3808, 072 dash 2 Alfa plus 255 minus 0270
112 & 12 3484, 073 dash 1 Bravo plus 210 minus
0615 11 13 04 3590, 074 dash 1 Bravo plus 279
minus 0645 115 & 12.

04 09 56 48 CC Apollo 7, Houston. Your readback is correct.
Correct pressure now is 104.

04 09 56 56 IMP Roger. I'll switch rings and give another one.
04 09 57 01 CC 103.
04 09 57 03 IMP 103. We are GO on ECS redundant, and we've just
changed our canister now.

04 09 57 10 CC Roger. And flight plan update lock and fuel cell
02 purge at 106 plus 00.
04 09 57 26 CC Roger. Are we coming up LOS?
04 09 57 26 CC Roger. About 1 minute to LOS. I can give you
a figure 3 dash 1 on your RCS update, if you want.

04 09 57 42 IMP Go ahead.
04 09 57 43 CC Roger. At 104 hours, you have a total of 715,
your ECS redline is 583. Your DAP redline
520. Hybrid redline 247, and those are points
you'll have to plot on your curve.

04 09 58 06 IMP Very good. Look like ...
04 09 58 14 CC Yeah. It's looking good. Be advised that quad A,
as far as the quad redline, is just right on
the RCS redline; all others are in good shape.
Roger. What happened to your transmission at Hawaii? Did you break up on land line?

Affirmative. Broke up on land line.

Okay. Standing by for Redstone.

Apollo 7, Houston through Redstone.

Roger, Houston. Five-by-five.

Roger. Loud and clear. Wait, I have some on-board readouts I'd like to get.

Go ahead.

Roger. SPS fuel and oxidizer quantity and the oxidizer imbalance, if any.

Our FUGS is not working I was told, so I haven't paid any attention to it, but I show the oxidizer imbalance reading a minus 300 or decreased 300, and it kinda jumps around during a burn. I don't think it means anything at all. The SPS quantity is remaining 17.15 percent oxidizer, 18.2 percent fuel. Over.

Roger. Copy. And your service module RCS propellant quantities?

And your batt C volts, while you're over there.

Houston, do you read now?

I missed it. Say again.

Okay. Ring A is about 51 percent.

Roger.
04 10 26 35  IMP  Ring C, 56 percent.
04 10 26 38  CC   Roger.
04 10 26 40  IMP  Ring D, 62 percent.
04 10 26 45  CC   Roger.
04 10 26 47  IMP  And B we don't count.
04 10 26 49  CC   Concur.
04 10 26 52  CC   Now, your batt C volts and your systems test
               meters 5 and 6, A through D, when you get a
               chance.
04 10 27 03  IMP  Roger. Batt bus A is reading 36 volts; batt bus
               B is reading 36.2 volts; 5 C is 5 volts; 5 D is
               5 volts; 6 D is 5 volts; 6 C is 5 volts; 6 B is
               5 volts; 6 A is 5 volts.
04 10 27 39  CC   Roger. Copy. All systems tests are 5 volts,
               and batt C we still need.
04 10 27 45  IMP  Okay. Batt C coming. Batt C shows 36.3 volts,
               and our present plans are not to heat the command
               module RCS prior to deorbit.
04 10 27 58  CC   We concur so far.
04 10 28 07  IMP  Any late breaking news in Houston, Ron?
04 10 28 10  CC   Say again.
04 10 28 13  IMP  What's the latest news in Houston?
04 10 28 17  CC   I have Lima Sierra for you.
04 10 28 23  IMP  Well, go ahead ...
04 10 28 27  CC   Roger. Lima Sierra, 072/061. And I have a
               Sierra Fox Trot at 075.
04 10 28 47 IMP Sierra Fox Trot at 0751. First there was Lima Sierra 072/061?
04 10 28 55 CC Roger.
04 10 29 01 IMP 6972/69.
04 10 29 08 CC Apollo 7. Apollo 7.
04 10 29 14 CC Apollo 7, Houston. Request cycle O₂ fan for 5 minutes in OFF.
04 10 29 21 IMP Okay. I've—we've been leaving number 1 in AUTO; is that your druthers?
04 10 29 28 CC We started out the other way and then Donn had it the other way, so it's—
04 10 29 40 IMP It's in AUTO, and the other one cycle on your callouts, right?
04 10 29 43 CC That's affirmative. So you have tank 1 in AUTO and tank 2 fans cycling now.
04 10 29 50 IMP ON for 5 minutes.
04 10 30 02 IMP Purge on time.
04 10 30 09 CC Apollo 7, Houston. Opposite omni.
04 10 30 51 CC 7, Houston. We have 1 minute to LOS. Our O₂ is about 63 pounds above the nominal flight plan at this time, and the H₂ is about a half a pound above the nominal flight plan. So we're in good shape.
04 10 31 08 IMP Very good.
04 10 52 56 CC ASCENSION (REV 68)
04 10 52 56 CC Apollo 7, Houston, Ascension. Standing by.
Roger. Thank you, Evans. Any more local news around there to report?

Roger. I can give you - looks like the end of the mission now predicted. The word I have, 25 percent O₂ left, and about 6.8 percent H₂ left.

Roger. I understand; that sounds good. About what I predicted on the hydrogen, I think, isn't it?

I think so. On the fuel cells, performance is right down the middle. Purging is turning out nominal. Looks like we'll plan to purge O₂ immediately prior to the SPS burn, and this should improve the load-sharing characteristics between the fuel cell and the battery.

Roger. I understand, and is the SPS burn nominally what it is in the flight plan?

The SPS burns are still per flight plans, yes.

Roger. Thank you. Did they tell you we're purging water before each SPS burn, too?

Say again, Wally.

I don't know whether you got the report or not, but there's vast water collecting all over the plumbing on the ECS, and it forms rather large blobs that we're going to have to take off before we get a burn going again ... that's all.

Roger. I understand you want to collect all the water at one place.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 10 54 57</td>
<td>CDR</td>
<td>Yes, not on the aft bulkhead!</td>
</tr>
<tr>
<td>04 10 54 59</td>
<td>CC</td>
<td>Right.</td>
</tr>
<tr>
<td>04 10 55 02</td>
<td>CDR</td>
<td>... burn checklist. Did you get to see the TV picture where the kind of sharp today.</td>
</tr>
<tr>
<td>04 10 55 16</td>
<td>CC</td>
<td>Yes, we did. It came through real good.</td>
</tr>
<tr>
<td>04 10 55 19</td>
<td>CDR</td>
<td>Very good. How has that onboard TV been showing up? Could you detect our motion, or are we moving too fast, or what?</td>
</tr>
<tr>
<td>04 10 55 31</td>
<td>CC</td>
<td>No, it's real good. If you have a real fast movement, you get a little bit of a blur, but just in the floating movements. It turns out real fine, real fine. It's amazing; it's much better than anything I've ever seen in ground testing.</td>
</tr>
<tr>
<td>04 10 55 49</td>
<td>CDR</td>
<td>Good deal. Is this taped during the ... so we can see it?</td>
</tr>
<tr>
<td>04 10 55 55</td>
<td>CC</td>
<td>Yes, it's taped.</td>
</tr>
<tr>
<td>04 10 55 59</td>
<td>CDR</td>
<td>Yes, okay.</td>
</tr>
<tr>
<td>04 10 56 02</td>
<td>CDR</td>
<td>Donn said he ... but 6 years ago he got to me that way.</td>
</tr>
<tr>
<td>04 10 56 09</td>
<td>CC</td>
<td>Missed that, Wally.</td>
</tr>
<tr>
<td>04 10 56 11</td>
<td>CDR</td>
<td>Six years ago, he asked me that question.</td>
</tr>
<tr>
<td>04 10 56 17</td>
<td>CMP</td>
<td>Only I had a tape on board, and I was about 3 minutes out on an Atlas.</td>
</tr>
<tr>
<td>04 10 56 25</td>
<td>CC</td>
<td>Okay.</td>
</tr>
</tbody>
</table>
04 10 57 05  CDR  You still there, Ron?
04 10 57 06  CC  Affirm.
04 10 57 08  CDR  What's the status of our tape recorder; have you dumped it recently?
04 10 57 12  CC  Roger. The last two passes we had over the Mercury. It wasn't quite as good. We're checking it out at Redstone now. It was good up until that time.
04 10 57 22  CDR  Roger. How about a chart update if you have time?
04 10 57 25  CC  Roger.
04 10 57 56  CC  Walt, can you check - your tape recorder forward switch in FORWARD?
04 10 58 01  CDR  It is.
04 10 58 03  CC  Roger. And here's your flight plan update.
04 10 58 06  CDR  Go ahead.
04 10 58 08  CC  REV 68, GET is note 107 plus 01 plus 55, longitude 15.9 east, right ascension 04 plus 47.
          MERCURY (REV 68)
04 11 26 56  CC  Apollo 7, Houston.
04 11 27 19  CC  Apollo 7, Houston through Mercury.
04 11 27 26  CDR  Roger, Houston. Loud and clear.
04 11 27 29  CC  Roger. I have a battery status if you're ready to copy.
04 11 27 45  CC  Apollo 7, Houston. Opposite omni.
04 11 27 52  CDR  Go ahead with the batteries.
Roger. You presently have three; in A 32.7, in B 30.2, in C 39.5 amperes hours.

Roger.

For pre-deorbit, you will have in A 24.8, in B 22.2, in C 39.5, for total of 86.5 amperes hours.

Roger.

Predicted post finding time will be 35 hours.

Roger. Understand, Ron. The only concern I have about battery charge is supporting the battery failure on a hybrid deorbit.

Roger. We concur. You might be interested: it's believed that we've had a slight change in the battery charger characteristics as a function of altitude, such that the charging voltage at the battery terminals is about two- to three-tenths volts lower than normal, and this would account for the decreased charging current. We're continuing ground testing to better define this anomaly.

This was done subsequent to our lift-off?

Say again, Wally.

You say this was done after we took off, Ron?

That's affirmative.

It's good work that they found it out.
<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 11 29 51</td>
<td>CC</td>
<td>Yes, right. No additional battery charging is anticipated at this time. We recommend minimizing battery OFF time for all burns.</td>
</tr>
<tr>
<td>04 11 30 09</td>
<td>CDR</td>
<td>That's kind of hard to do, but we'll do it.</td>
</tr>
<tr>
<td>04 11 30 13</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 11 30 19</td>
<td>CDR</td>
<td>... we're going to break up and get Donn on watch shortly. He'll be with you on next call.</td>
</tr>
<tr>
<td>04 11 30 28</td>
<td>CC</td>
<td>Roger. Understand. Have a good night's sleep.</td>
</tr>
<tr>
<td>04 11 30 32</td>
<td>CDR</td>
<td>Good night. Ron, did you have psi system power up? We had it written here on the flight plan here at about 107 20.</td>
</tr>
<tr>
<td>04 11 30 45</td>
<td>CC</td>
<td>Roger. It's in there. We're checking on it right now.</td>
</tr>
<tr>
<td>04 11 30 52</td>
<td>LMP</td>
<td>We'll hold off on it then, I guess.</td>
</tr>
<tr>
<td>04 11 30 56</td>
<td>CDR</td>
<td>If you need it, you can get it from Donn Eisele over the next Redstone.</td>
</tr>
<tr>
<td>04 11 31 01</td>
<td>CC</td>
<td>Roger. There's no problem there. It's just to run the state vector up.</td>
</tr>
<tr>
<td>04 11 31 06</td>
<td>CDR</td>
<td>Yes.</td>
</tr>
<tr>
<td>04 11 31 09</td>
<td>LMP</td>
<td>I guess I'd like to still keep an iron in the fire on that battery charge status.</td>
</tr>
<tr>
<td>04 11 31 19</td>
<td>CC</td>
<td>Affirmative. We're still working on it.</td>
</tr>
<tr>
<td>04 11 31 23</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 11 31 46</td>
<td>CC</td>
<td>Wait, we've got the 101 backup batteries in Downey, and we're running tests on those tonight.</td>
</tr>
</tbody>
</table>
Thank you, Ron.

GUAM (REV 68)

Apollo 7, Houston. Opposite omni.

There you go -

Hell, Ron, tomorrow maybe you can add a Baker-tare update to that.

Baker-tare?

That's the other one I mentioned to you. Plus you gave me that for Lima Sierra.

That is after the slant.

Oh, Ron, how about the longitude on that chart update? We missed it.

Roger. Just a second.

Roger. REV 68.

Roger. Go ... 107 plus 02 55. What's longitude?

Roger. Longitude 15.9 east, right ascension 04 plus 47.

Thank you. 107 02 55 is the time. Right?

That's Roger. And request batt C readout again; missed it last time.

Batt C is 36 1 or 2.

Roger. 36.4.

36.2.

36.2. Roger.

REDSTONE (REV 68)

Apollo 7, Houston through Redstone.
03 11 58 59  CC  Apollo 7, Houston.
04 11 59 38  CC  Apollo 7, Houston.
04 11 59 43  CMP  Houston, Apollo 7. I'm reading you.
04 11 59 46  CC  Roger. Good morning.
04 11 59 54  CMP  Roger. How are you?
04 11 59 58  CC  Getting along in good shape. Donn, on this
again, I think that Walt gave me batt Bravo
instead of Charlie voltage last time. Request
batt Charlie voltage.

04 12 00 14  CMP  Okay. Stand by 1 minute.
04 12 00 17  CC  Wilco.
04 12 01 19  CC  Okay. I wonder how much it would foul them up
if they delayed eating until they were on TV.
04 12 01 47  CMP  Ron, I read batt C as 36 volts.
04 12 02 01  CMP  I think that's down a little; I believe it was
about 37 when we first got up here.
04 12 02 07  CC  We concur.
04 12 04 54  CC  Apollo 7, Houston. One minute LOG; Ascension
at 23.
04 12 05 01  CMP  Roger. Ascension at 23. Understand.

ASCENSION (REV 69)
04 12 23 55  CC  Apollo 7, Houston, Ascension. Standing by.
04 12 24 01  CMP  Roger, Houston.
04 12 24 03  CC  Roger. Loud and clear.
04 12 24 13  CMP  Ron, would you log me 15 clicks on water,
please?
04 12 24 20  CC  I missed that, Donn. Say again.
04 12 24 21  CMP  Roger. Fifteen clicks on the water gun.
04 12 24 23  CC  Roger. Got it.
04 12 24 25  CMP  Okay. I just had a good, solid 8 hours sleep and feel pretty good. I've got a miserable head cold, but other than that, everything's going fine.
04 12 24 39  CC  Okay. Sounds good, then.
04 12 24 43  CMP  My only concern right now is what's going to happen to my ears when we reentry, but I hope by then I'll get over it some.
04 12 24 53  CC  We kind of feel that you will, and we hope, anyhow.
04 12 24 57  CMP  I guess we'll cross that when we come to it.
04 12 25 00  CC  Roger.
04 12 25 30  CC  Apollo 7, Houston.
04 12 25 33  CMP  Go.
04 12 25 34  CC  Roger. We've had a little concern about the voice quality on the DSE there the last couple of dumps, and what we would like you to do is after this pass go ahead and talk into the tape recorder, mention the time on it, and then give us a time at the next station there, and we can play it back and check it out that way real good.
Roger. You say you want me to record something on the tape and read the time onto it so you can check it next pass. Is that right?

Affirmative. And then give us a time that you were talking into it.

Okay. Will do.

Ron, I've got some results of a sextant star count we did at about 98 hours.

Roger. Ready to copy.

Okay. At sunrise, first of all, the moon was in the field of view, and that tends to wipe out a lot of stars, but at sunrise, I counted 12 stars, at plus 04 two stars, plus 08 one star, and plus 12 three stars.

Roger. I copy, Donn.

Then they all went away, except a couple of bright ones right after sunrise. At sunset minus 12 four, minus 8 15, minus 4 30, and at sunset, I saw 40 or more. Of course, this was at the other attitude when the moon was not in the field of view. I could see the constellation Sagittarius very plainly and all the other major stars that appeared in the telescope at that time.

Roger.

I recommend that we knock off the remaining star counts on the basis that we don't need -
really need - to put window shades up to get
dark adapted because even if you are dark
adapted, if you look in a telescope, you get
belted with light; it ruins it anyway. And the
best way to get dark adapted is to put your
eyeball up there and leave it there for several
minutes.

04 12 26  06  CC   I see. Okay. So the window shades are not doing
any good is what you're saying there. Right?

04 12 26  14  CMP   I think so; yes. I don't think the window
shades would help that much.

04 12 26  17  CC   Okay.

04 12 26  18  CMP   It's not the sunlight coming in the windows
that keeps you from getting dark adapted any-
way.

04 12 26  25  CC   Roger.

04 12 26  29  CMP   I had roughly the same sort of light pattern
in the telescope that I had on the earlier
test. There was a bright ring around the edge
of it and a broad band across the middle of it,
and this light pattern didn't disappear in the
sunset.

04 12 26  47  CC   All right.

04 12 26  49  CMP   In fact, on that second check, come to think of
it, there wasn't any band across the middle.
It was pretty clean scope, and I think it had
to do just with the respect to the earth, how close it is to the direction you're looking.

O 12 29 05  CC  I understand.

O 12 29 21  CC  Donn, --

O 12 29 23  CMP  Yes.

O 12 29 24  CC  -- we never got the sunset - the sunset part of that first star count thing there. If it's convenient in your log, we'll take that.

O 12 29 39  CMP  Roger. I understand you did not get the data on the first one.

O 12 29 42  CC  We got the sunrise part of it, but not the sunset part of it.

O 12 29 51  CMP  Roger. At sunset, we had thinning going on, and it wiped it out completely.

O 12 30 00  CC  Oh, I see. Okay.

O 12 30 02  CMP  There were so many fireflies, snow flakes, out there I couldn't see - tell the stars from the flakes.

O 12 30 10  CC  I understand.

O 12 31 36  CC  Thirty seconds LOS. We'll pick you up Mercury on the hour.

O 12 31 43  CMP  Okay.

MERCURY (REV 69)

O 13 00 41  CC  Apollo 7, Houston through Mercury. Standing by.

O 13 00 46  CMP  Roger. Houston, Apollo 7.

O 13 00 49  CC  Roger. Loud and clear.
<table>
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<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 13 00 52</td>
<td>CMP</td>
<td>Well, I put a short voice recording on the tape about - it was at 108 44.</td>
</tr>
<tr>
<td>04 13 01 01</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>04 13 01 03</td>
<td>CMP</td>
<td>That's give or take a few seconds ... I think it was about 108 33 40 actually, but that's the nearest minute.</td>
</tr>
<tr>
<td>04 13 01 12</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 13 02 05</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 13 02 09</td>
<td>CMP</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>04 13 02 12</td>
<td>CC</td>
<td>Roger. Donn, do you have time to give us a little run down where you found out the best place to sleep in?</td>
</tr>
<tr>
<td>04 13 02 22</td>
<td>CMP</td>
<td>Yes. We're still sleeping under the couches in space, and that seems to work out best. We've tried free floating and tried keeping strapped down in the sleeping bags, and the latter seems to be better off. I think you can also sleep in the couches if you're strapped down, I guess, but if there's more than one person ... you're kind of in the way. The only problem with sleeping under the couch - at least on the right side; I haven't checked the left, but I know on the right - it tends to get hot under there for some reason; not hot, but a little warmer than the rest of the spacecraft. I don't think there's much air circulation.</td>
</tr>
<tr>
<td>04 13 03 06</td>
<td>CC</td>
<td>Roger. Thank you, Donn. We copied.</td>
</tr>
<tr>
<td>Time</td>
<td>Caller</td>
<td>Message</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>04 13 03 37</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>04 13 03 40</td>
<td>CMP</td>
<td>Hey, good morning.</td>
</tr>
<tr>
<td>04 13 03 42</td>
<td>CC</td>
<td>Mr. Eisele.</td>
</tr>
<tr>
<td>04 13 03 45</td>
<td>CMP</td>
<td>That's right.</td>
</tr>
<tr>
<td>04 13 03 47</td>
<td>CC</td>
<td>Donn, what's the word - what's the configuration of your window shades when you have both of them asleep? Do you have most of your window shades up?</td>
</tr>
<tr>
<td>04 13 03 55</td>
<td>CMP</td>
<td>Negative. We haven't even pulled them out of the can the whole flight.</td>
</tr>
<tr>
<td>04 13 03 58</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 13 04 00</td>
<td>CMP</td>
<td>It doesn't seem to be a problem when you are asleep; you just try to bury your head under something down under the couch, and you don't even notice the sunlight much.</td>
</tr>
<tr>
<td>04 13 04 10</td>
<td>CC</td>
<td>Okay. Let me ask you one other question. Sack this out: what about with respect to that telescope and stars in the daytime; can you ascertain anything at all until you're past the terminator out of the telescope?</td>
</tr>
<tr>
<td>04 13 04 30</td>
<td>CMP</td>
<td>No, we started out to - you mean coming into sunset?</td>
</tr>
<tr>
<td>04 13 04 40</td>
<td>CC</td>
<td>Yes, in other words, doing a P51 during daytime.</td>
</tr>
<tr>
<td>04 13 04 45</td>
<td>CMP</td>
<td>Roger. If you lucked out and it happened to end up with the optics pointed at the optimum position - that is, in other words, well away</td>
</tr>
</tbody>
</table>
from the earth and also well away from the sun -
I believe that, say 5 to 10 minutes from sunset
or sunrise, you probably could see it. That's
last night, at that one setting, ... in there,
I could have done an alignment; but the problem
of the PSL is that we don't have an alignment
to start with, and you don't know how to point
the thing.

Yes. All right. Real fine.

... got, if you already had an alignment, you'd
just rather do a fine align; you can do that okay.
... and I have seen a number of stars in the sex-
tant during daylight.

Okay.

GUAM (REV 69)

Apollo 7, Houston. Opposite omni.

Roger.

AOS Redstone at 32.

Roger. Roger. See you at Redstone.

Roger.

REDSTONE (REV 69)

Apollo 7, Houston through Redstone.

Roger, Houston.

Roger. Reading you about three-by, Donn.

... got both hands full and the mike slipped.

Is that better?
04 13 32 34  CC  Say again slower; I couldn't read you.
04 13 32 40  CMP  All right. Disregard.
04 13 33 09  CC  Apollo 7, Houston. How do you read?
04 13 33 13  CMP  Loud and clear.
04 13 33 15  CC  Okay. You're coming in loud and clear. While we have some quiet time, I would just like to ask you a couple more of questions, Donn. When you're in the local horizontal attitude, can you observe the horizons out the rendezvous windows below you?
04 13 33 34  CMP  You mean how far below the X-axis can you see?
04 13 33 37  CC  Yes.
04 13 33 40  CMP  I don't know. I've never been precisely in that attitude to look. I don't believe you can, though.
04 13 33 45  CC  Okay. Well look, one --
04 13 33 46  CMP  ... I'm not sure, Tom, we haven't really done any precise local horizontal maneuvers yet.
04 13 33 54  CC  Okay. Well, down the line in the next day or so, if you get a chance, I wish you would do that so we can get our simulators calibrated. And, also, out the side windows -- the 1 and 5 window when you're in local horizontal -- if you will just make a pencil mark there, we can then get our simulators calibrated to that.
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Transcript</th>
</tr>
</thead>
<tbody>
<tr>
<td>04133412CMP</td>
<td>Okay. A good time to do that may be in the landmark tracking, because we'll be lined up with local horizontal anyway.</td>
<td></td>
</tr>
<tr>
<td>04133420CC</td>
<td>Okay. If you can, just make a note of that and check because it will sure help us on getting these - you know, quantitative data for the simulators and also to pass on to the other crews.</td>
<td></td>
</tr>
<tr>
<td>04133429CMP</td>
<td>Okay. Will do. Incidentally, the optics of the simulator are pretty realistic. What I'm seeing through these optics in here are almost identical with respect to star visibility and so on.</td>
<td></td>
</tr>
<tr>
<td>04133442CC</td>
<td>Oh, okay. Particularly with the telescope, what we see in the telescope is about what you've got there in flight, Donn.</td>
<td></td>
</tr>
<tr>
<td>04133449CMP</td>
<td>That's exactly right. You have to keep your eyeball on there for several minutes before you can begin to see any stars.</td>
<td></td>
</tr>
<tr>
<td>04133456CC</td>
<td>I see.</td>
<td></td>
</tr>
<tr>
<td>04133457CMP</td>
<td>... using the telescope.</td>
<td></td>
</tr>
<tr>
<td>04133458CC</td>
<td>Okay.</td>
<td></td>
</tr>
<tr>
<td>04133459CMP</td>
<td>... out the windows.</td>
<td></td>
</tr>
<tr>
<td>04133501CC</td>
<td>Okay. That is even at nighttime too, huh?</td>
<td></td>
</tr>
<tr>
<td>04133504CMP</td>
<td>That's right.</td>
<td></td>
</tr>
<tr>
<td>04133744CMP</td>
<td>Houston, Apollo 7.</td>
<td></td>
</tr>
<tr>
<td>04133747CC</td>
<td>Apollo 7, Houston. Go.</td>
<td></td>
</tr>
</tbody>
</table>
04 13 37 50  CMP  Oh, hi, Bill. I just checked the command mod-
ule RCS temperatures, and all six of them are
pegged at 5 volts plus.
04 13 38 01  CC  Roger. Understand. All the CM BC - CM RCS
temps are pegged at 5 volts plus.
04 13 38 09  CMP  That's right.
04 13 38 11  CC  Okay.
04 13 39 18  CC  Apollo 7, Houston. One minute LOS Redstone;
Ascension on the hour.
04 13 39 25  CMP  Roger.

ASCENSION (REV 70)
04 14 00 44  CC  Apollo 7, Houston through Ascension.
04 14 00 49  CMP  Roger, Bill. Apollo 7.
04 14 00 51  CC  Roger.
04 14 02 10  CC  Apollo 7, Houston.
04 14 02 15  CMP  Roger, Houston. Go.
04 14 02 17  CC  Roger. Could you give us an estimate on the
time the CDR and IMP went to sleep?
04 14 02 29  CMP  Yes. Stand by; I'm looking at the log here.
04 14 02 32  CC  Say again, please? ...
04 14 02 43  CMP  I think it was 109 hours, 108 hours.
04 14 02 47  CC  Roger.

REDSTONE (REV 70)
04 15 06 08  CC  Apollo 7, Houston through Redstone.
04 15 06 12  CMP  Roger. Houston, Apollo 7.
04 15 06 21  CC  It looks like we both have the night watch.
04 15 06 26  CMP  Yes, it works out that way, doesn't it?
Apollo 7, Houston.

Roger, Houston. 7. Go.

Say, I have a procedure here on this television operation which I'm just gonna pass up so you don't need to write it down. It's pretty simple. It involves a technique to get the best TV picture, and it sort of goes like this. When holding the TV, during the next TV period, take a look at the position of the AL switch and report the position. That's probably before you start taking the television pictures. Then about one-half way through, during the period of television, change the position of this AL switch. The AL stands for auto light, although it isn't automatic.

Okay. I got you.

And —

Using the AL light.

All right. They will be coordinating with you from the ground. Also, another point, it takes the TV about 90 seconds to warm up, about a minute and a half to warm up.

I see. Okay. We'll keep that in mind.

Right. Thank you.

Apollo 7, Houston. We would like to turn the $2_{\text{O}_2}$ tank 2 fans on for 5 minutes and then off. I'll remind you just about LOS.

Roger.
Apollo 7, Houston. I may have passed that up incorrectly. If I said OFF, it should be ON.

Turn them on for 5 minutes and then off.

Roger. I got you; keep going now.

Apollo 7, Houston. Say, Donn, we're not getting anything on the BIOMED. Have you changed anything?

Roger. I'll have it on in a couple of minutes.

Okay. Thank you.

Apollo 7, Houston. Opposite omni, please. Also, I have a little bit more information on that television. That AL stands for automatic light control. It's similar to automatic gain control in an electric circuit, apparently, and it prevents a bright light source from sort of washing out the picture.

Roger. Go and understand.

Thank you.

Apollo 7, Houston. Coming up on LOS; Canaries at 36.

Roger. Read you.

And you can turn the number 2 CRYO fan back off.

Roger.

CANARY (REV 71)

Apollo 7, Houston.
04 15 36 19  CMP  Houston, Apollo 7.
04 15 36 21  CC  Roger. Through Canary I have a request. I would like a reading on pyro batt A, B, and batt C.
04 15 36 34  CMP  Roger. Batt C is 36.0 volts.
04 15 36 44  CC  36.0.
04 15 36 47  CMP  Stand by for the pyros.
04 15 36 48  CC  Roger.
04 15 37 20  CMP  Bill, I'm reading 37.0 volts for both pyros.
04 15 37 24  CC  Roger. 37.0. In what position are you leaving the DC indicator?
04 15 37 33  CMP  Oh, it varies. I usually leave it on one of the main bus voltages.
04 15 37 37  CC  Good. That is what we'd like, main A or main B.
04 15 37 41  CMP  Roger.
04 15 37 42  CC  Thank you.
04 15 38 02  CMP  Hey, Bill.
04 15 38 04  CC  Roger.
04 15 38 06  CMP  Ask the tower if they've got a recommended flap setting, too.
04 15 38 11  CC  Okay, will, and you might check the friction in the throttle there.
04 15 38 16  CMP  Roger. (Laughter)
04 15 38 26  CC  When I shake the stick mobile, you've got it.
04 15 38 35  CMP  It says use plenty.
04 15 40 43  CC  Apollo 7, Houston. Opposite omni.
04 15 40 48  CMP  Roger.
04 15 40 50  CC  Thank you.
04 15 42 18  CC  Apollo 7, Houston. One minute LOS Canary; Honeysuckle at 23.
04 15 42 27  CMP  Roger. Honeysuckle at 23.
04 15 42 30  CC  Roger.
04 15 42 31  CMP  Do you want S-band up for that?
04 15 42 34  CC  (Laughter) Roger. S-band up for that one.
04 15 42 39  CMP  Okay.

**Honeysuckle (REV 71)**

04 16 23 23  CC  Apollo 7, Houston through Honeysuckle.
04 16 23 32  CC  Bill.
04 16 23 42  CC  Okay.

**Redstone (REV 71)**

04 16 39 56  CC  Apollo 7, Houston through Redstone. I have a flight plan update when you're ready to copy.
04 16 40 08  CMP  Roger. Houston, go ahead with your flight plan update. Also would like to enter map update when you get through with this one.
04 16 40 18  CC  Roger. I'll give you a map update as soon as I get through with the flight plan.
04 16 40 29  CMP  Bill, would you log me 40 clicks with the water pistol and two aspirins, please?
04 16 40 39  CC  How many clicks?
04 16 40 39  CMP  40.
04 16 04 41 CC Roger. Forty clicks on the water and two aspirins.

04 16 40 46 CMP In 4 hours.

04 16 40 53 CC The flight plan update will start at 115 plus 10. CMC power up.

04 16 41 14 CMP Roger.

04 16 41 16 CC Okay. You can delete the reference to CMC power up at 117 plus 20.

04 16 42 00 CMP ...

04 16 42 03 CC Roger. At 118 plus 00, add fuel cell O2 purge, also unstow and set up TV. That's at 118 plus 00 hours.

04 16 42 29 CMP Roger.

04 16 42 33 CC Next item is at 119 plus 04. TV ON.

04 16 42 54 CMP Roger. TV ON at 119 04. Do you want us to turn it on 90 seconds before that, and let it warm up, or is that the turnon time you want?

04 16 43 03 CC Roger. That'll take care of it. The Texas AOS is 119 plus 06, Texas acquisition at 119 plus 06, and sorry to interrupt, but we need opposite omni.

04 16 43 17 CMP Roger.

04 16 43 42 CC And, Donn, you can let me know when you're ready to resume copy of flight plan update.

04 16 43 48 CMP Roger. I'm all ready.

04 16 43 50 CC Okay. At 119 plus 30, SCS attitude reference check previously scheduled at 89 hours and
50 minutes, 89 plus 50. That's just for information. And we'd like that SCS attitude reference check starting at 119 plus 30 at 30-minute intervals up to the time of the burn.

04 16 44 33 CMP  Roger. You want that at 30-minute intervals to burn time.

04 16 44 37 CC  So if you want to, make a tick at 120 plus 00 and 120 plus 30.

04 16 45 08 CMP  Okay.

04 16 45 09 CC  Okay. The notation is 121 hours in reference to SPS burn 3, the time is 120 plus 43.

04 16 45 28 CMP  Roger. Understand that you're going to burn at 120 plus 43.

04 16 45 32 CC  Roger. And over there in the box where it says two-jet ullage, you can write in quads Bravo and Delta, quads B and D.

04 16 45 46 CMP  Roger. We got you on that.

04 16 45 48 CC  Roger. And you can delete the line in reference to initiate battery charging.

04 16 45 58 CMP  Okay. Got that.

04 16 46 00 CC  Delete the half box in reference to the star count test there, the telescope star count test, sun line of sight, et cetera.

04 16 46 13 CMP  Roger.

04 16 46 15 CC  Under the line where it says MCC update, add "For landmark tracking." You will receive an update for landmark tracking at that time.
04 16 46 36 CMP Understand landmark tracking update.
04 16 46 39 CC Roger. And at 121 plus 20, P52 option 3.
04 16 46 51 CMP Roger.
04 16 46 55 CC At 121 plus 40, state vector voice update.
04 16 47 08 CMP You say state vector voice update?
04 16 47 10 CC Affirmative.
04 16 47 12 CMP What's that for?
04 16 47 14 CC Stand by. That's for the landmark tracking, in case you need it.
04 16 47 23 CMP Can't you uplink it?
04 16 47 26 CC If required. That's in case you need it for the landmark tracking, it's not — Roger. In case anything happens during the landmark tracking, you'll have a state vector to fall back on.
04 16 47 47 CMP Oh, I get you.
04 16 47 50 CC Okay. You can delete the reference to the star count test 3 at 122 hours. Apollo 7, we're coming up on LOS Redstone. I'll pick you up at Antigua for the rest of the flight plan update.
04 16 48 12 CMP Roger.
04 16 48 15 CC Antigua at 58.
04 16 48 28 CC Apollo 7, Houston. If you're still reading, the map update is REV 72, node 112 plus 56 plus 50, 74.9 degrees west.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 16 59 06</td>
<td>CC</td>
<td>Apollo 7, Houston through Antigua.</td>
</tr>
<tr>
<td>04 16 59 12</td>
<td>CMP</td>
<td>Roger. Houston.</td>
</tr>
<tr>
<td>04 16 59 13</td>
<td>CC</td>
<td>Roger. I'll go ahead with the flight plan update. Before I start, did you read the map update?</td>
</tr>
<tr>
<td>04 16 59 23</td>
<td>CMP</td>
<td>I got as far as REV 72 and 112 plus 56.</td>
</tr>
<tr>
<td>04 16 59 28</td>
<td>CC</td>
<td>Okay. REV 72, 112 plus 56 plus 50, nodal crossing at 74.9 west.</td>
</tr>
<tr>
<td>04 16 59 49</td>
<td>CMP</td>
<td>Roger. Fifty-six plus 50 and then 74.9 west.</td>
</tr>
<tr>
<td>04 16 59 54</td>
<td>CC</td>
<td>Roger. And continuing with the flight plan update at 122 hours.</td>
</tr>
<tr>
<td>04 17 00 05</td>
<td>CMP</td>
<td>Roger. Go.</td>
</tr>
<tr>
<td>04 17 00 07</td>
<td>CC</td>
<td>Roger. At 122 hours, delete the three references, H₂ heaters ON, telescope star count, and fuel cell purge. Add at 122 hours, 222 ORB NAV (except marks). At 122 plus 20, P23 update, star and gimbal angles.</td>
</tr>
<tr>
<td>04 17 01 01</td>
<td>CMP</td>
<td>Roger. At 112 plus 20, you got a P - what happened at 122? What did you say about the landmarks again? I didn't get that.</td>
</tr>
<tr>
<td>04 17 01 12</td>
<td>CC</td>
<td>Okay. That was not landmarks. Perhaps it is sufficient just to say at 122 hours P22 ORB NAV, and at 122 plus 20, P23 update.</td>
</tr>
<tr>
<td>04 17 01 35</td>
<td>CMP</td>
<td>Does that mean you want me to do a P - orbital navigation at 122?</td>
</tr>
</tbody>
</table>
04 17 01 40 CC Affirmative.
04 17 01 44 CMP How let's - okay. I don't get it. You want
me to do an ORB NAV from 122 on to sometime,
and also during that period, you are going to
be reading updates to us?
04 17 02 03 CC Well, at 122 plus 20, there will be a P23
update star and gimbal angles.
04 17 02 13 CMP Okay. I figure that might be better off a
little later after we get done with my orbital
NAV.
04 17 02 20 CC Okay. Let's talk about it in just a minute.
Let me go ahead and go through the rest of
the updates. At 123 hours, delete the refer-
ence to COAS calibration. At 123 plus 30,
add P23 star horizon sighting.
04 17 03 08 CC You can delete the reference to the attitude
control tests that occur at about 123 plus 45.
04 17 03 22 CMP Roger.
04 17 03 24 CC At 124 plus 20, add G&W SCS power down, and
delete the reference to P504 COAS evaluation.
04 17 03 52 CMP Roger, Bill.
04 17 03 55 CC Okay.
04 17 03 56 CMP Go ahead.
04 17 03 58 CC At 125 plus 30, delete the reference to P23.
04 17 04 07 CMP Roger.
04 17 04 09  CC  And that is the end of the update. Let me check on this other thing.

04 17 04 14  CMP  Okay. How long of this pass is this ORB NAV supposed to take?

04 17 04 19  CC  All right. Stand by.

04 17 04 29  CC  The ORB NAV takes one daylight pass.

04 17 04 34  CMP  Roger. That is just what I thought.

04 17 04 37  CC  Okay. And you are thinking that the P23 update is going to catch you right in the middle there.

04 17 04 43  CMP  It shouldn't be too bad. Walt can probably write it down while we're doing the rest of it.

04 17 04 48  CC  Okay.

04 17 04 50  CMP  How come you moved the P23 up 2-hours? Is that to get done so we can get to bed?

04 17 04 57  CC  Affirmative.

04 17 04 59  CMP  I see.

04 17 05 01  CC  We're coming up on LOS. And one other quick item - we just want to - at the point - at the risk of belaboring a point, Donn and Wally's correction, Wally and Walt's sleep period lasts until 116 plus 00 hours.

04 17 05 18  CMP  Roger. I got that.

04 17 05 20  CC  Okay. We will have Canaries at 09.

04 17 05 28  CMP  Okay. I'll see you then.

04 17 05 31  CC  Thank you.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 17 09 52</td>
<td>CC</td>
<td>Apollo 7, Houston through Canary.</td>
</tr>
<tr>
<td>04 17 09 59</td>
<td>CMP</td>
<td>Roger, Bill.</td>
</tr>
<tr>
<td>04 17 16 03</td>
<td>CC</td>
<td>Apollo 7, Houston. Coming up 1 minute LOS Canary; Carnarvon at 46.</td>
</tr>
<tr>
<td>04 17 16 10</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 17 46 40</td>
<td>CC</td>
<td>Apollo 7, Houston through Carnarvon.</td>
</tr>
<tr>
<td>04 17 46 46</td>
<td>CMP</td>
<td>Roger. Houston, Apollo 7.</td>
</tr>
<tr>
<td>04 17 50 15</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS Carnarvon. S-band volume up at 53 for Honeysuckle.</td>
</tr>
<tr>
<td>04 17 50 23</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 17 53 51</td>
<td>CC</td>
<td>Apollo 7, Houston through Honeysuckle.</td>
</tr>
<tr>
<td>04 17 55 08</td>
<td>CC</td>
<td>Apollo 7, Houston through Honeysuckle.</td>
</tr>
<tr>
<td>04 17 55 14</td>
<td>CMP</td>
<td>Roger. Apollo 7. Read you.</td>
</tr>
<tr>
<td>04 17 55 16</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 17 55 25</td>
<td>CMP</td>
<td>Bill, would you log me another 24 clicks of water, please?</td>
</tr>
<tr>
<td>04 17 55 30</td>
<td>CC</td>
<td>Roger. Twenty-four clicks. Thank you.</td>
</tr>
<tr>
<td>04 17 58 17</td>
<td>CC</td>
<td>Hey, Donn, how you feeling?</td>
</tr>
<tr>
<td>04 17 58 21</td>
<td>CMP</td>
<td>Say again, Bill.</td>
</tr>
<tr>
<td>04 17 58 23</td>
<td>CC</td>
<td>How you feeling today?</td>
</tr>
<tr>
<td>04 17 58 26</td>
<td>CMP</td>
<td>Oh, pretty fair.</td>
</tr>
<tr>
<td>04 17 58 27</td>
<td>CC</td>
<td>Good.</td>
</tr>
<tr>
<td>Time</td>
<td>Code</td>
<td>Message</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>04 17 58 28</td>
<td>CMP</td>
<td>I've got kind of a head cold, but other than that, everything's fine.</td>
</tr>
<tr>
<td>04 17 58 32</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 17 58 38</td>
<td>CMP</td>
<td>Just sitting here doing my daily dozen.</td>
</tr>
<tr>
<td>04 17 58 41</td>
<td>CC</td>
<td>Oh, good.</td>
</tr>
<tr>
<td>04 17 58 48</td>
<td>CMP</td>
<td>That's my only chance. Those other guys get up, and they monopolize it.</td>
</tr>
<tr>
<td>04 17 58 52</td>
<td>CC</td>
<td>Yes, I saw them on television this morning.</td>
</tr>
<tr>
<td>04 17 58 59</td>
<td>CMP</td>
<td>Say again.</td>
</tr>
<tr>
<td>04 17 59 00</td>
<td>CC</td>
<td>I saw them using the exerciser on television this morning.</td>
</tr>
<tr>
<td>04 17 59 05</td>
<td>CMP</td>
<td>Oh, is that right?</td>
</tr>
<tr>
<td>04 17 59 07</td>
<td>CC</td>
<td>Roger. Rubber-necking just like everyone else.</td>
</tr>
<tr>
<td>04 17 59 11</td>
<td>CMP</td>
<td>Right.</td>
</tr>
<tr>
<td>04 17 59 35</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS; Carnarvon at 14; Redstone at 14.</td>
</tr>
<tr>
<td>04 17 59 43</td>
<td>CMP</td>
<td>Roger. Thought maybe we were turning around and going the other way for a minute.</td>
</tr>
<tr>
<td>04 17 59 46</td>
<td>CC</td>
<td>That's a pretty good trick if you can pull it off. Might wake the other fellows, though.</td>
</tr>
<tr>
<td>04 17 59 54</td>
<td>CMP</td>
<td>Right.</td>
</tr>
<tr>
<td>04 18 14 28</td>
<td>CC</td>
<td>REDSTONE (REV 72)</td>
</tr>
<tr>
<td>04 18 17 41</td>
<td>CMP</td>
<td>Apollo 7, Houston through Redstone.</td>
</tr>
<tr>
<td>04 18 17 44</td>
<td>CC</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>04 18 17 44</td>
<td>CC</td>
<td>Apollo 7, Houston. Go.</td>
</tr>
</tbody>
</table>
Roger. I was just looking over this flight plan for the 8-hour active period. Looks like we're pretty well booked up. I guess the point I wanted to make is that the burn is to be the event of the day, and I take it that if we get behind or have any problems, we'll probably drop some of these other things if we need to.

Roger.

Apollo 7, Houston. One minute LOS Redstone; Bahamas at 31.

Roger.

ANTIGUA through BERMUDA (REV 73)

Apollo 7, Houston through Antigua.

Roger, Houston. Apollo 7.

Roger. Donn, I'd like a readout on batt C - Charlie - voltage.

Roger. That's 36 volts.

Thirty-six. Thank you. Also, Donn, I've been taking a look at the flight plan. And it may look a bit crowded, but we think everything could be gotten in there in the normal course of events in getting ready for the burn. However, we have looked at a couple of things here that could be deleted without affecting anything. First off, if you start getting crowded,
you can scrub the photography entries, which sort of goes without saying. Second, you can scrub the SCS attitude reference checks. And third, delete the P22 exercises associated with P52.

Roger.

You know, if you get in a bind.

Yes, I think we can get through it okay, Bill.

I just wanted to point out that if we do get behind and if we do have any problems, we will probably drop them.

Roger. The point is well taken.

Apollo 7, Houston. One minute LOS Antigua; Canary 43.

Roger.

CANARY (REV 73)

Apollo 7, Houston through Canary.

Roger.

Houston, Apollo 7.

Go.

Say, Bill, instead of powering up at 115 10 and doing a P23 trunnion check, I think I'd just as soon wait and do that at the time we do the start of horizon landmark business - start of horizon navigation.

Roger.
04 18 44 44  CMP  In other words, I don't see any point in powering and maneuvering around to do one little check, --

04 18 44 48  CC  Right.

04 18 44 49  CMP  -- when it would be easier to do the same thing a little later - catch them all at the same time, probably.

04 18 46 32  CC  Apollo 7, Houston. Regarding the power up at the latter time: just before the new state vector is agreeable here.

04 18 46 44  CMP  Okay.

04 18 46 46  CC  And we'll change our flight plan accordingly.

04 18 46 48  CMP  Right.

04 18 49 54  CC  Apollo 7, Houston. One minute LOS Canary.

We'll have another minute at Madrid if you turn the S-band volume up if you need to call us.

04 18 50 05  CMP  Okay.

04 18 50 15  CC  And Carnarvon at 18.

04 18 50 23  CMP  Roger.

CARNARVON (REV 73)

04 19 18 40  CC  Apollo 7, Houston through Carnarvon.

04 19 18 46  CMP  Roger.

04 19 22 37  CMP  Houston, Apollo 7.

04 19 22 40  CC  Apollo 7, Houston. Go.
04 19 22 42 CMP Roger. Would you log me another 30 clicks of water?

04 19 22 46 CC Say again the number.

04 19 22 49 CMP Three-zero.

04 19 22 50 CC Roger. Three-zero.

04 19 22 53 CMP Roger.

04 19 25 18 CC Apollo 7, Houston. One minute LOS Carnarvon; Honeysuckle at 26 so you can turn up your 8-band volume in about 1 minute.

04 19 25 29 CMP Roger.

HONEYSUCKLE (REV 73)

04 19 29 00 CC Apollo 7, Houston. Request O₂ tank 2 fans ON 5 minutes then OFF.

04 19 29 09 CMP Roger, Houston.

04 19 31 18 CC Apollo 7, Houston.

04 19 31 22 CMP Roger, Houston. Go.

04 19 31 24 CC Roger. I'm not sure I'll have the full time on this pass because of the keyhole. I'll have a block data for you at Texas, and we'll have Texas on the hour.

04 19 31 39 CMP Roger.

04 19 34 03 CC Apollo 7, Houston. Coming up on LOS Honeysuckle. You can get the fans back OFF in about half a minute.

04 19 34 10 CMP Roger.
TEXAS through ANTIGUA (REV 73)

04 20 01 35  CC  Apollo 7, Houston through Texas.
04 20 01 38  CMP  Roger.
04 20 01 40  CC  Roger. I have a block data update when you're ready to copy.
04 20 01 45  CMP  Stand by, Bill.
04 20 02 15  CMP  Go ahead with the update, Bill.
04 20 02 17  CC  Roger. Block data: 075 dash 1 Alfa plus 311 minus 0650 117 24 04 3443, 076 dash 1 Alfa plus 302 minus 0650 119 00 11 3592.
04 20 03 17  CMP  Roger.
04 20 03 18  CC  077 dash 1 Alfa plus 238 minus 0630 120 33 36 2888, 078 dash h Alfa plus 310 minus 1600 123 17 25 3410, 079 dash h Alfa plus 307 minus 1600 124 53 h3 3520, 080 dash h Alfa plus 263 minus 1611 126 27 32 3137. Read back.

TEXAS through ANTIGUA (REV 74)

04 20 05 17  CMP  Roger.
04 20 05 38  CMP  075 dash 1 Alfa plus 311 minus 0650 177 24 04 3443, 076 dash 1 Alfa - I'll have to get the lat and long again from you - The time was 11900 11 3592, 077 1 Alfa plus 238 minus 0630 120 33 36 2888, 78 dash h Alfa plus 310 minus 1600 123 17 25 3410, 079 dash h Alfa plus 307 minus 1600 124 53 h3 3520, 080 dash h Alfa plus 263 minus 1611 126 27 32 3137.
Roger. On the first block, the time was 117 plus 24 plus 04.

Roger. I got that.

Roger. And on the next block, the lat and long are plus 302 minus 0650.

Okay. Plus 302 minus 0650.

Roger. And the fourth block: 078 minus 4 Alfa; the long is minus 1600.

Roger. Minus 1600.

Roger. Readback is correct.

Okay. Thanks.

Go.

Apollo 7, Houston. You're GO for 92 dash 1.

Roger. You're GO for 92-1.

Houston, Apollo 7.

Apollo 7, Houston. Go.

Roger. Would you log me one Lomatin, please?

Would you say again, please?

Roger. About half hour ago, I took one Lomatin...

Apollo 7, Houston. I'm having difficulty reading you.

Roger. Understand.

Now you're very clear. Would you say again, please?
04 20 11 44 IMP Roger. About 30 minutes ago, I took one Lomotil. Would you please log that?
04 20 11 50 CC Roger. Thank you.

CANY (REV 74)
04 20 17 52 CC Apollo 7, Houston through Canary.
04 20 23 28 CC Apollo 7, Houston. One minute LOS Canary; Carnarvon at 52.
04 20 23 36 SC Roger.

CARNARVON (REV 74)
04 20 53 06 CC Apollo 7, Houston through Carnarvon.
04 20 53 25 CC Apollo 7, Houston through Carnarvon.
04 20 53 33 CMP Go ahead, Houston.
04 20 53 35 CC Good morning, Donn. How are you this morning?
04 20 53 38 CMP Oh, just fine, Jack. Just had a fight with this computer here.
04 20 53 42 CC Roger. Donn, would like to get a battery C voltage readout here at Carnarvon.
04 20 53 52 IMP Roger. Battery C is showing 36.5, and good morning, Jack.
04 20 53 57 CC Good morning, Walt, and how are you?
04 20 54 01 IMP Fine.
04 20 54 02 CC And we're going to be sending you a state vector and target load over Texas, and I'll have the maneuver PAD and NAV check to pass up to you.
04 20 54 14 IMP Roger. At the same time?
Roger. And one other thing I wanted to discuss with you here at this time is the TV went over so well yesterday, we'd like to know if you could save one of your breakfast packages to demonstrate eating on television this morning?

We'll give them something interesting, but we'll probably be mostly through breakfast by then. If we have any food left, we will eat it for the audience.

Okay. Would appreciate it if you could do it.

We're going to eat - we're starting our breakfast now, Jack, and we're not going to want to schedule things around that TV camera.

Okay. Understand.

What's the news this morning, Jack?

I'm getting it summarized now. Will be passing it up to you in a little bit. We'll pick up Honeysuckle here, Walt, at 117 00. You want to turn up your S-band?

117 00. We'll turn up the S-band.

Roger.

Apollo 7, Houston. Looks like your primary evaporator is drying out again.

You know, that thing runs fine all night long until you guys come on.

Maybe it's me.
That started down during this pass, didn't it?

Jack, about that: Walt's just came on, too.

Good morning, Wally. Could we get you to set down the primary evaporator to go to DECREASE on the back pressure switch? And do not reservice it at this time.

You want another increase, don't you? I'm shutting it down now.

Excuse me. INCREASE on the back pressure switch.

That's in work. Whenever it dried out, I go ahead and close it up. You don't want it reserviced now?

That is affirmative.

What we would like to do is have the reservice take place 117 plus 15.

Roger. Is that to be over a station, or do you just want me to write it down?

You can do it on your own.

Okay. I'll give it 2 minutes of water at 117 15.

Apollo 7, Houston through Guaymas.

Roger. Ready to copy that data.

Okay. The maneuver PAD: SPSh, minimum impulse 12043 all balls plus 00129 minus all balls minus all balls 1563 plus 0901 000 78 29705 minus 085 minus 055 burn time 000 42 1161 321
120 00 0000 minus 3103 plus 09634 1417; roll, pitch, and yaw are all balls. Remarks: heads-up, SES posigrade, the sextant star not visible after 120 plus 20 plus 00.

Roger. Jack, nice speed on that. Readback as follows: SPS4 12043 0000 00129 minus 5 balls minus five balls 1563 plus 0901 00078 29705 minus 085 minus 055 000 42 1161 321 120 two balls four balls minus 3103 plus 09634 1417; all balls on the attitude, heads-up, SES posigrade, the sextant star before 120 plus 20. Over.

That is affirmative. I have the morning news for you.

Go ahead.

Go ahead. We're all on.

Apollo 7, before that, could we get you to go to ACCEPT, so we'll send up your target load and state vector?

Roger. We're drinking our morning coffee.

Roger. The Supreme Court acts of yesterday now assure that all 50 states will have three candidates to pick from for the November election. The headlines this morning says, "Apollo 7 Sails On." And there is a picture of Harriet Kisele watching the TV pass from the viewing
room here at MCC. And at the Olympics, Al Herter became the first athlete in history to win a fourth gold medal. He has won the discus event in every Olympics since 1966, and that's about it from your friendly newscaster.

Thank you, Jack. I appreciate that. Thanks, Jack.

Roger.

It seems like Mr. Herter is a very durable athlete.

He sure is.

GUAYMAS through BERMUDA (REV 75)

Apollo 7, Houston.

Go ahead, Jack.

Roger. Guaymas had a visual sighting of you as you passed over.

Very good. We have a picture - a couple of visuals of them.

Roger.

Apollo 7, Houston. We have finished our update. The computer is yours.

Thank you, Jack.

We'll buy it.

Apollo 7, Houston. Thirty seconds LOS Bermuda; Canaries at 117 plus 51.

Roger. See you then.
04 21 52 36  CC  Apollo 7, Houston through the Canaries.
Standing by.
04 21 52 40  LMF  Roger, Jack. How come we don't have our tape running?
04 21 52 45  CC  Stand by.
04 21 52 49  CDR  Jack, while you are there, observe our pitch rate at this time.
04 21 52 54  CC  Okay. Stand by. I don't have that display called up, Wally. Just a minute.
04 21 53 00  CDR  This is one of those free pitch rates again.
04 21 53 03  CC  Ah so.
04 21 53 06  CDR  We are pretty well convinced that this machine does not want to fly X-axis vertical, either down or up.
04 21 53 13  CC  Copy that.
04 21 53 15  CDR  And that's how we get these gimbal locks in once in a while without even suspecting it — or a lot of rapid change of attitude. I think you can see my pitch rate will start decreasing; it's in four-tenths of a degree per second, and I have no pitch in.
04 21 53 32  CC  Okay. I'm watching it now.
04 21 53 38  CDR  All my channels are OFF. How should I go to — you want GDC on number 1 ball; is that what it is?
<table>
<thead>
<tr>
<th>Time</th>
<th>Agency</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 21 53 43</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>04 21 53 47</td>
<td>CDR</td>
<td>I'll have to align it.</td>
</tr>
<tr>
<td>04 21 54 06</td>
<td>CDR</td>
<td>We'll give you 1620; you can watch that.</td>
</tr>
<tr>
<td>04 21 54 10</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 21 54 38</td>
<td>CDR</td>
<td>The computer's busy thinking the thing over.</td>
</tr>
<tr>
<td>04 21 54 48</td>
<td>CDR</td>
<td>Had a pitch rate decreasing there; don't know if you can see that.</td>
</tr>
<tr>
<td>04 21 54 50</td>
<td>CC</td>
<td>Roger. I can see that.</td>
</tr>
<tr>
<td>04 21 54 54</td>
<td>CDR</td>
<td>I didn't do a thing to it. It's not transferring, not to another; that's another point.</td>
</tr>
<tr>
<td>04 21 55 02</td>
<td>CC</td>
<td>Okay. Copy that.</td>
</tr>
<tr>
<td>04 21 55 06</td>
<td>CDR</td>
<td>I could have blown a lot of fuel trying to do that.</td>
</tr>
<tr>
<td>04 21 55 10</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>04 21 55 11</td>
<td>CDR</td>
<td>But it wasn't worthwhile that we explore this one on this mission. I'm getting pitch towards zero for nothing.</td>
</tr>
<tr>
<td>04 21 55 35</td>
<td>CC</td>
<td>Wally, your X-axis now pointed heads down toward the earth?</td>
</tr>
<tr>
<td>04 21 55 43</td>
<td>CDR</td>
<td>Generally towards the earth; that's right. We are - the S-IV - the big engine is sort of ahead of us, and our - the plus X is sort of trailing. You got the angles now. Now you notice the rates are almost stopped, and I haven't done anything to the spacecraft.</td>
</tr>
<tr>
<td>04 21 56 09</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>Time</td>
<td>Station</td>
<td>Call</td>
</tr>
<tr>
<td>------</td>
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<tr>
<td>04 21 56 12</td>
<td>IMP</td>
<td></td>
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<tr>
<td>04 21 56 14</td>
<td>CC</td>
<td></td>
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<tr>
<td>04 21 56 34</td>
<td>CC</td>
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<tr>
<td>04 21 56 40</td>
<td>IMP</td>
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<tr>
<td>04 21 56 41</td>
<td>CC</td>
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<tr>
<td>04 21 57 06</td>
<td>CDR</td>
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<tr>
<td>04 21 57 14</td>
<td>IMP</td>
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<tr>
<td>04 21 57 23</td>
<td>CC</td>
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<tr>
<td>04 21 57 38</td>
<td>IMP</td>
<td></td>
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<tr>
<td>04 21 57 56</td>
<td>IMP</td>
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<tr>
<td>04 21 57 57</td>
<td>CC</td>
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<tr>
<td>04 21 58 04</td>
<td>IMP</td>
<td></td>
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<td>(GOSS NET 1)</td>
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<tr>
<td>04 22 11 21</td>
<td>CC</td>
<td></td>
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<tr>
<td>04 22 11 33</td>
<td>CDR</td>
<td></td>
</tr>
<tr>
<td>04 22 11 36</td>
<td>CC</td>
<td></td>
</tr>
</tbody>
</table>
five-tenths of a foot-pound torque possible
going through perigee when you're broadside —
going through perigee broadside to the direction
of flight. This produces a possible rate of
.03 degrees per second per second in pitch due
to drag. I would like to ask you if this
torquing rate that you experienced exists
throughout a complete revolution, or is more
pronounced - noticeable - at perigee only?

We have already discovered it's more pronounced
at perigee; we were thinking here last night
going across the States and across the Atlantic,
and we could see it more strongly ... pitch up;
it didn't matter what the roll was. As we came
across perigee, we started torquing right back,
and we tended to go in RCS most of the time.

Okay. Copy. And we do have some more inform-
ation on your secondary switchover.

Go.

Okay. Our best data for your onboard gage
readings for secondary tanks switchovers are as
follows. Are you ready to copy?

Go.

Okay. Quad A 46 percent; Quad B switch with
tank quad D Dog; quad C Charlie 54 percent;
quad D Dog 49 percent; and, at present, quad C
is the closest to switchover, the predicted switchover time should be approximately 140 hours GEF.

Roger. And our meter readings are 46; Baker goes with Dog, 54 and 49 percent; we should switchover quads when they are indicating that to us? Over.

That's affirmative, 7.

Thank you.

Hey, Jack, has that correlation between our onboard readings and the actual quantities been fairly consistent ... ?

That's affirmative, Walt. We think the numbers we have passed you are pretty good numbers right now.

Thank you.

0₃₂ purge will be complete in 30 seconds.

Apollo 7, Houston. About 20 seconds LOS. Tenesanrive; Carnarvon at 118 plus 26.

CARNARVON (REV 75)

Apollo 7, Houston through Carnarvon.

Roger. Loud and clear.

Roger. Standing by.

Apollo 7, Houston. One minute LOS Carnarvon. Would you turn up S-band for contact with Honeysuckle?
<table>
<thead>
<tr>
<th>Time</th>
<th>C/DR</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 22 33 24</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 22 36 00</td>
<td>IMP</td>
<td>Houston, Apollo 7. Over.</td>
</tr>
<tr>
<td>04 22 36 02</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>04 22 36 04</td>
<td>IMP</td>
<td>Roger. I've got four balls 5 for triangle difference on Rigel - I've got five balls, excuse me, on Rigel and Sirius, and you're reading the torquing angles now.</td>
</tr>
<tr>
<td>04 22 36 15</td>
<td>CC</td>
<td>Affirmative. We followed you all the way through 52 there, Donn.</td>
</tr>
<tr>
<td>04 22 36 19</td>
<td>IMP</td>
<td>This is not the regular navigator.</td>
</tr>
<tr>
<td>04 22 36 23</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>04 22 36 30</td>
<td>IMP</td>
<td>This is the alternative navigator.</td>
</tr>
<tr>
<td>04 22 36 33</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
</tbody>
</table>

**HAWAII through BERMUDA (REV 75)**

<table>
<thead>
<tr>
<th>Time</th>
<th>C/DR</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>04 22 56 24</td>
<td>CC</td>
<td>Apollo 7, Houston through Hawaii. Standing by.</td>
</tr>
<tr>
<td>04 22 56 27</td>
<td>CDR</td>
<td>Roger. ...</td>
</tr>
<tr>
<td>04 23 04 59</td>
<td>CMP</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>04 23 05 01</td>
<td>CC</td>
<td>Go ahead. 7.</td>
</tr>
<tr>
<td>04 23 05 04</td>
<td>CMP</td>
<td>Roger. Are you receiving our program?</td>
</tr>
<tr>
<td>04 23 05 07</td>
<td>CC</td>
<td>It's not coming through yet, Donn.</td>
</tr>
<tr>
<td>04 23 05 11</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>04 23 06 27</td>
<td>CMP</td>
<td>Are you picking up anything, Jack?</td>
</tr>
<tr>
<td>04 23 06 29</td>
<td>CC</td>
<td>Not yet, Donn. We're just about to get our handover to Texas. We should be picking up shortly.</td>
</tr>
</tbody>
</table>
04 23 06 34  CMP  I see. Okay. We're not there yet.
04 23 06 42  CMP  Wally's complaining. He says he's got a sinus
     that's getting heavy.
04 23 06 50  CC   Copy that.
04 23 07 46  CC   Still nothing yet, Dom.
04 23 08 02  CC   Apollo 7. Opposite omni.
04 23 08 07  CMP  Roger.
04 23 08 45  CC   Apollo 7, Houston. Could you switch to the
     omni antenna in between?
04 23 08 51  CMP  Roger.
04 23 08 58  CC   There it is; there it is.
04 23 09 00  CDR  Okay.
04 23 09 03  CDR  Jack, are you receiving the picture now?
04 23 09 05  CC   We're receiving the picture; it's a little
     From the lovely Apollo Room high atop every-
     thing.
04 23 09 19  CDR  Roger. This is your captain speaking on this
     flight, and you can unfasten your seat belts
     and relax, and we hope we can make this flight
     enjoyable for you. At this time, we would like
     to demonstrate one of our minor problems here;
     in fact, I should tell you what time it is.
     Just one moment, and we'll get a computer on
     the line here.
04 23 09 43  LMP  It's in ENTER now.
Okay. We'll reset that.

He's getting up.

And we now have our time counting. It is 119 hours 9 minutes and some odd seconds into the flight. One of our problems at this time is making note of the small arrow here; we're not sure what it means in that up is not necessarily up or down, but we will discuss that at a later time. What you just observed was a fumbling attempt to get the keyboard working on our DSKY, which is our display keyboard; and the numbers you are reading is the time generated from the onboard computer. I'd now like to show you Walt Cunningham preparing some our food at our food station. I'll bring you in close to show you what our food stations have. We have two buttons: the upper button is COLD, the lower is HOT; and there is a spout that Wally is now uncovering. When we depress the button, with the appropriate container over the silver spout, we deliver 1 ounce of water, be it hot or cold. At this time, Walt will get some of the food. One of the nice features of the food preparation on this flight is - a nice feature about the food is that we have hot water, and this makes the food much more
enjoyable and quite palatable. We are using a pair of surgical shears to cut open the upper portion of the plastic bag, and we pry open the spout, which will then interface with the tap. At this point, Walt is applying it to the tap. On this trip, we use cold water. We are reconstituting some fruit juice. You see him depress the button, and each depression supplies 1 ounce of cold water. This water is quite delightful. It's cold as hell; it's about 50 to 65 degrees Fahrenheit. At first, we were adding chlorine to the water daily to be sure there were no contaminants or bacteria that would develop in the water. This left a rather bad aftertaste. We are now adding chlorine approximately every other day.

HAWAII through ANTIGUA (REV 76)

He is now adding 5 ounces of water. You may notice the bubbles that are in the bag. There's a little bit of gas in the water; this does not cause us too much problems. If you get a lot of gas it does, and we have to clean the gas back out again. Fortunately, this has not happened too often. Then, the next step is to knead the bag; this mixes the powder concentrate with the water; and then we end up with a
complete drink. We may have a zero-g demonstration available for you here, where we can spin the bag, and you will notice the bubbles are sort of breaking and falling apart. They do not form a solid mass of bubbles, but you can see in the center a rather interesting formation of bubbles.

I'd like to pass the camera now to Donn Eisele. I'd like to try to show you the problem we have with the water condensation underneath on the other panel. Here goes the camera to Donn.

While Wally is getting under the couch to demonstrate the suction that we use to clean up the water that has been accumulating on the cold pipes, I'll describe the system that we do have. We have an overboard dump hose, which dumps the liquid we have in the spacecraft overboard through a heated vent; that hose has been passed to Donn, and he has a purge fitting attached to the end of it. I'm now going to go to the dump position on the waste management system, and Wally will be vacuuming up some water while Donn and I throw light on it.

Apollo 7, Houston. Could you give us the position of the switch on the TV camera?

ALC is OUT.
04 23 14 45 CC We would like to switch that position to IN, to the ALC position.
04 23 14 49 IMP Roger. Is your picture satisfactory?
04 23 14 53 CC It's a good picture; we're trying to improve it a little.
04 23 14 57 CMP Roger. We're trying to show you a picture of a plumbing fitting that has a lot of water on it, clinging to it. Can you see the water on the fitting?
04 23 15 09 IMP Can you see the water on the fitting, Jack?
04 23 15 12 CC We're looking; don't quite see it.
04 23 15 16 CMP Okay. Can you see the fitting?
04 23 15 19 CC Affirmative. Could you go back to the OUT position?
04 23 15 23 CMP It's always worked better in the OUT position. Maybe you will see it when he starts sucking it up.
04 23 15 28 IMP Okay. Now he's going to suck up the water with the vacuum line we have. It's a very, very small vacuum, but so far, it seems to have worked pretty well at taking water overboard. It's a pretty good size blob of water that's - yes - takes quite awhile. Are you observing that, Jack?
04 23 16 04 CC Affirmative. We got you five-by. We've got about another minute and a half of picture here.
Okay. Okay. This is part of our regular preparation for a burn now, is to clean off what water we can see because after an SPS burn it seems to end up on the aft bulkhead. This water is formed by condensing on the cold glycol lines. Donn will finish out the run by showing you the MDC in front of the commander's station. Go ahead and talk, Donn.

All right. This is the commander's station. The left-seat driver controls the attitude of the spacecraft and also the operation of the main system.

This instrument in the middle is the heart of the whole thing, really. It is called our Flight Director Attitude Indicator which is comparable to the artificial horizon in an airplane, except that it operates in all three axes instead of just two. These various switches control the configuration of the manual attitude control system. We can hold an attitude, or we can free drift. We can have two or three modes to use the handcontroller. This is the handcontroller that you use to slide the spacecraft around various attitudes manually. These switches here control the electronics and whether or not the signals get
from the handcontroller out to the little jets to fire them.

Are you still picking up the picture, Jack?

Negative. We just lost the picture. That was a real good demonstration of your little home there.

Roger. See you tomorrow, same time, same station.

Apollo 7. One minute LOS Bermuda.

We pick you up at Tananarive at 119 plus 43.

Roger.

And, Walt, Low was in the viewing room, saw it all, sends you regards.

Oh, thank you very much, Jack.

Jack, could you get a view of that water blob down there?

We couldn't pick up the water itself very closely, but we saw approximately what you were vacuuming.

Okay. That's one of the areas; there are a number of them where they collect. There is one right inside where the steam duct is; I'm in there now. There's a real big blob of water.

Roger. Copy. we'll see you at Tananarive.

TANANARIVE (REV 76)

Apollo 7, Houston through Tananarive.

Roger, Houston.
04 23 46 12 CC We're standing by.
04 23 47 35 LMP Houston, Apollo 7.
04 23 47 39 CC Go ahead, 7.
04 23 47 41 LMP Roger. What are you doing about putting the water boiler back on here?
04 23 47 42 SC (Laughter)
04 23 47 50 CC Walt, the COMM is real bad here at Tamanarive. I could hardly make you out. Could you say again?
04 23 47 57 LMP Okay. It's a question of putting the water boiler back on the line.
04 23 48 04 CC Stand by.
04 23 48 28 CC Apollo 7, Houston. You can bring the water boiler back on the line. We will take a look at it over Carnarvon at 120 plus 00.
04 23 48 37 LMP Roger. We'll put it back.
04 23 48 39 CC Roger.

ARI A 2 (REV 76)
04 23 55 50 CC ARIA 2, go REMOTE.
04 23 55 55 CT ARIA 2 has AOS. ARIA 2 has AOS.
04 23 57 13 CC Apollo 7, Houston through ARIA 2.
04 23 58 03 CC Apollo 7, Houston through ARIA 2.
04 23 58 44 CC Apollo 7, Houston through ARIA 2.
05 00 00 50  CC  Apollo 7, Houston through Carnarvon.
05 00 01 27  CC  Apollo 7, Houston through Carnarvon.  Standing by.
05 00 01 36  CDR  Roger, Houston.
05 00 04 18  IMP  Houston, Apollo 7.
05 00 04 19  CC  Go ahead, 7.
05 00 04 22  IMP  Roger.  I've got the shaft at 115.33 and the trunnion at 31.707 for the sextant star check.
05 00 04 35  CC  Roger.  We copied that, and, Walt, we would like your O₂ fans tank 2 ON for 3 minutes.
05 00 05 51  CC  Apollo 7, Houston.  Your sextant star check is GO, and we would like to remind you to have turned the batteries OFF as soon as possible after the burn.
05 00 06 04  IMP  Wilco.
05 00 06 06  CDR  Jack, we did a - skip that - require, request an 8CP attitude reference check at 119 hours and 30 minutes. I did that the other day and gave you an hour and 15 minutes comparison. That data should be better than the check we've had a call for.
05 00 06 23  CC  Okay. We copy that.
05 00 06 26  CDR  It's not that I didn't want to do it, but we did it for free when we had a good chance to do it.
05 00 06 31  CC  Okay.
05 00 06 33  CDR  That data should be in.
05 00 07 51  CC  Apollo 7. One minute LOS Carnarvon; Hawaii at 120 plus 25.
05 00 08 05  CC  We concur. Looks good here.

HAWAII (REV 76)

05 00 26 15  CC  Apollo 7, Houston through Hawaii.
05 00 26 18  CDR  Roger. Loud and clear.
05 00 26 24  CC  Wally, we saw - as you went over the hill, we saw you looking at HOUN 54. Your R1 and R2 will be zero in that HOUN because the S-IVB and FSM speed vectors that we uplinked awhile back are the same. The FSM state vector is a good state vector.
05 00 27 00  CDR  Okay. That's tank 1 OFF and tank 2 OFF. Is that correct?
05 00 27 03  CC  That is affirmative.
05 00 27 06  CDR  Okay. I'll turn tank 1 off now.
05 00 27 52  CC  Apollo 7, all your systems and everything looks real good here on the ground.
05 00 27 56  CDR  Roger. We're GO.
05 00 27 59  CDR  Jack, on this, we have flight plan seat assign-

ment.
05 00 28 08  CC  Roger.  Copy that, Wally.
05 00 28 10  CDR  That includes COMM connections as well.
05 00 28 14  CC  Okay.
05 00 32 05  LMP  Houston, Apollo 7. Over.
05 00 32 08  CC  Go ahead, 7.
05 00 32 09  LMP  Roger. I forgot to give you a reading. I had
246 mm of O₂ partial pressure this morning.
05 00 32 15  CC  Okay. Copy that.
          HUNTSVILLE (REV 76)
05 00 35 25  CT  Huntsville AOS.
05 00 36 27  CT  Huntsville AOS.
05 00 38 31  CDR  Okay. We'll go on. Start pitch one and yaw one.
05 00 38 36  CMP  Pitch left. Start.
05 00 38 38  CDR  ON.
05 00 38 39  CMP  Yaw one. Start.
05 00 38 41  CDR  ON.
05 00 38 45  CMP  ... properly.
05 00 39 01  CMP  ON.
05 00 39 03  CDR  GFI.
05 00 39 15  CMP  Did. Receive?
05 00 39 19  CDR  It's verified.
05 00 39 20  CMP  Pressure's neutral - 00 MPM.
05 00 39 23  CDR  ...
05 00 39 36  CT  Huntsville LOS.
          GOLDSTONE through BERMUDA (REV 76)
05 00 39 57  CC  Apollo 7, Houston. Could we have omni Able, 
please?
05 00 40 08 CME I missed it.
05 00 40 09 CDR On my direct command ... attitudes, yaw three.
                   Ready? Commence.
05 00 40 16 CME ... like this.
05 00 40 41 CC  Apollo 7, Houston. I'll give you a time back
                   at 2 minutes.
05 00 40 55 CC  Five, four, three, two, one.
05 00 41 00 CC  MARK.
05 00 41 01 CC  T minus 2 minutes.
05 00 41 02 CME ... five-five.
05 00 41 04 CDR  Five and five.
05 00 41 05 CDR  DELTA V test A and B normal.
05 00 41 08 CME  DELTA V test A and B normal.
05 00 42 29 CDR  ... DELTA-V, ON.
05 00 42 34 CME  Roger.  ON.
05 00 42 35 CDR  And 20 seconds ullage.
05 00 42 37 CME  Roger.  Ullage for 20.
05 00 42 45 CME  Ullage.
05 00 42 50 CC  Ten, nine, eight, seven, six, five, four, three,
                   two, one, zero.
05 00 43 02 CDR ...
05 00 43 10 CDR  Gimbal OFF, ... OFF.
05 00 43 16 CDR  DELTA-V thrust ... OFF.
05 00 43 18 CME  DELTA-V ... OFF.
05 00 43 20 CDR  Okay.  We've got 10 seconds ...
05 00 43 23 CME  Roger.
05 00 43 24  CDR    ...  
05 00 43 26  CMP    Okay ... residuals minus ... balls 24, and ... four balls 1 at first.  
05 00 43 38  CDR    Gimbal motors OFF and gimbal motors circuit breakers OPEN.  
05 00 43 44  CDR    ... power.  
05 00 43 45  CMP    Roger. Gimbal motor circuit breakers are OPEN, and ... power is OFF.  
05 00 43 50  CDR    Direct RCS OFF.  
05 00 43 51  CMP    Direct RCS coming OFF.  
05 00 43 53  CDR    Main bus ... OFF.  
05 00 43 57  CMP    Roger. In free drift now in the slosh mode test.  
05 00 44 03  CC      Roger. Copy.  

GOLDSTONE through BERMUDA (REV 77)  
05 00 44 05  LMP    Did you copy my DSKY? Have you got the ... on that?  
05 00 44 08  CC      Affirmative.  
05 00 44 09  CDR    ... mode still OPEN. Stand by ... control.  
05 00 44 20  CDR    ...  
05 00 44 23  CMP    ... controls are locked.  
05 00 44 24  CDR    EMS OFF.  
05 00 44 25  CMP    OFF. EMS counter is reading minus 7.7.  
05 00 44 30  CC      Roger. Copy that.  
05 00 44 34  CMP    That means it's been 15.3, I guess.  
05 00 44 38  CC      Roger.  
05 00 44 53  CDR    Believe it or not, we saw all four ball valves.
05 00 44 59 CC Roger. Say again, Wally?
05 00 45 02 CDR All four ball valves rolled - kind of a surprise in that short burn.
05 00 45 06 CC Okay.
05 00 46 45 CDR Houston, we just checked our file batteries, and both are 30 second volts.
05 00 46 49 CC Roger. Thank you.
05 00 47 03 LMP Jack, did you ever drive those little amusement park cars, those bumper things?
05 00 47 10 CC Say again.
05 00 47 11 CDR Those little scooter things: when you try to pass, you bump off the guard rails and crash into each other? That's the best analogy we can think of for that particular burn: like plunging head-on into somebody in one of those amusement park scooters.
05 00 47 26 CC Oh, Roger. Roger. Copy that. We got a recommended Off time down here of .51 seconds.
05 00 47 35 CDR Roger.
05 00 47 43 CC Wally, how long has it been since you have been to an amusement park and done that?
05 00 47 47 CDR I'm not going to tell.
05 00 47 49 CC Roger.
05 00 47 50 CDR ... age only a couple of days ago.
05 00 48 56 CDR Jack, we're going to re-rig our couch so we'll have one man on watch; two will be going off.
05 00 49 07 CC Wally, we couldn't copy that. Could you say again?
05 00 49 10 CDR We are going to re-rig our couch seats and our ...
05 00 49 20 CC We still couldn't get it, Wally.
05 00 49 23 CDR We are going to put the crew back into their
original seat assignments.
05 00 49 26 CC Roger. Copy.
05 00 52 47 CC Apollo 7, Houston. You are 1 minute LOS Bermuda;
we pick you up at Ascension at 121 plus 03.
04 00 52 57 CDR Jack, I just could get our landmark PAD update.
Over.
05 00 53 02 CC Roger. We have the landmark track PAD. I'll
pass it up to you at Ascension. Your orbit now
90.3 by 157.5.
05 00 53 14 CDR All right.
05 00 53 48 CMP Hello, Air Boss. Hello, Air Boss. This is
Apollo 7. Do you read?
05 00 54 10 CT Roger. Read you loud and clear. How me?
05 00 54 15 CMP We're overhead and doing well.
05 00 54 29 CT Air Boss, Air Boss, Apollo 7. Over.
05 00 54 48 CT Air Boss, Air Boss. Break, break, break, Air
Boss.
05 00 55 01 CMP Hello, Essex. Hello, Essex. This is Apollo 7.
Do you read?
05 00 55 08 CMP Hello, Air Boss. Air Boss, Apollo 7.
05 00 55 21 CDR Hello Air Boss. Hello, Air Boss. Apollo 7. Do
you read?
05 01 03 44  CC  Apollo 7, Houston through Ascension.
05 01 03 48  IMP  Roger, Jack.
05 01 03 51  CC  Roger, Walt, we would like to have you switch
your O2 tank 1 fans to AUTO.
05 01 03 59  IMP  A few minutes ago, the ... temperature was all
the way down to 34 degrees, and steam pressure
was about .07 or .08.
05 01 04 12  CC  Roger. We copy that. We would like to find out
what cyclic water accumulator you are operating
on now.
05 01 04 23  CMP  Roger. We’re on AUTO 1, and every once in a
while, we hear some gurgling sounds. I shouldn’t
say every once in a while, but several times we
have heard gurgling sounds in the outlet pipes
of the umbilicals. At that time, we generally
turn the water accumulator AUTO, OFF and manually
cycle the water accumulator three or four times.
Seems to have helped.
05 01 04 45  CC  Okay. Copy that. Did you switch auto accumu-
lators lately, Walt?
05 01 04 56  IMP  Unless the last time anybody used the manual
water accumulators, maybe then they turned it
to OFF and went back to a different one. But
I switch it regularly every day in the redun-
dant component check.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 01 05 10</td>
<td>CC</td>
<td>Okay. Real fine. We copied some calls down to Air Boss. I think some of the conversations you heard from the ground were that of the recovery forces. They were conducting an exercise in the Atlantic there.</td>
</tr>
<tr>
<td>05 01 05 24</td>
<td>CDR</td>
<td>Roger. Understand that. We actually got to interrupt their conversation as he switched from Apollo 1 to Apollo 7.</td>
</tr>
<tr>
<td>05 01 05 33</td>
<td>CC</td>
<td>Roger. I am ready with this landmark tracking PAD whenever you are ready to copy.</td>
</tr>
<tr>
<td>05 01 05 46</td>
<td>CT</td>
<td>Okay. Surgeon, what do you want? Surgeon? Wait. RECOMM, what did you make of that?</td>
</tr>
<tr>
<td>05 01 06 17</td>
<td>CMP</td>
<td>Jack, this is Donn. Go ahead with your landmark update.</td>
</tr>
<tr>
<td>05 01 06 20</td>
<td>CC</td>
<td>Okay. Landmark 1D 10 south, next landmark 67 on track, third one, 141 south. GET first landmark, 122 plus 14, 122 plus 24, 122 plus 35.</td>
</tr>
<tr>
<td>05 01 07 00</td>
<td>CMP</td>
<td>Roger. Understand. First landmark is 10 south, number 2 is 67 on track, number 3 is 141 south. The times are 122 plus 14, 122 plus 124, 122 plus 35.</td>
</tr>
<tr>
<td>05 01 07 19</td>
<td>CC</td>
<td>That is correct.</td>
</tr>
<tr>
<td>05 01 07 23</td>
<td>CMP</td>
<td>Roger. We got you.</td>
</tr>
<tr>
<td>05 01 07 34</td>
<td>CC</td>
<td>Apollo 7, would you switch your BIOMED to CMP?</td>
</tr>
<tr>
<td>05 01 07 43</td>
<td>CMP</td>
<td>Will do.</td>
</tr>
<tr>
<td>05 01 07 44</td>
<td>CDR</td>
<td>We changed around so much we lost that one.</td>
</tr>
</tbody>
</table>
05 01 07 46  CC  Copy.
05 01 07 50  CDR  You mean he has a signature now?
05 01 07 54  CC  Affirmative.
05 01 08 10  CDR  Hey, Jack.
05 01 08 11  CC  Go ahead.
05 01 08 12  CDR  How are our pulse rates doing up here these days?
05 01 08 18  CC  Stand by.
05 01 08 21  CDR  Okay.
05 01 09 42  CC  Apollo 7, Houston. The pulse rates for CDR run
60 to 70, for CMP 75 to 90, with 118 during the
burn, and LMP has been running around 80.
05 01 10 02  CDR  They have gone up during the burn? Very good.
05 01 10 04  CC  Okay. We are just about to lose you over Ascen-
sion; Tananarive at 121 plus 19.
05 01 10 12  CDR  Roger. Jack, ask the medics to save that strip
of Sanborn for Donn as the burn starts. It's a
nice souvenir for him.
05 01 10 23  CC  Will do, Wally.
05 01 10 25  CDR  I still have that one from my ...
TANANARIVE (REV 77)
05 01 20 55  CC  Apollo 7, Houston through Tananarive.
05 01 21 01  CDR  Roger.
05 01 21 07  LMP  Roger. Log LMP 20 clicks of water.
05 01 21 14  CC  And, 7, you might be interested that tropical
storm Gladys is now officially a hurricane. Its
present position is approximately over Havana.
You'll be able to see it your next rev. You'll pass almost over it.

Roger. Thanks much.

Houston, Apollo 7.

Go ahead, Apollo 7.

Roger. We're scheduled for a P52 ... alignment at this time. I wonder how critical that is. We're not in the proper attitude for it, and since we have to maintain a local vertical for it ...

Apollo 7, could you say again? COMM through Tananarive is pretty poor.

Roger. Regarding the P52 alignment at this time: I would prefer not to do that. Over.

Okay. Copy. Stand by.

Apollo 7, we concur. Negative P52.

Roger. Thank you.

And, 7, we've got about 1 minute LOS Tananarive. We would like to try an S-band contact through ARIA 2 at approximate 121 plus 30.

Okay. We'll do that.

ARIA 2 (REV 77)

ARIA 2, go REMOTE.

Apollo 7, Houston through ARIA 2.

Apollo 7, Houston through ARIA 2.

Go ahead, Houston.
05 01 31 50  CC  Roger. Five-by through ARIA 2.
05 01 31 44  CDR  Very good; best ARIA we've had yet.
05 01 31 50  CC  We thought this is about the best COMM we've had through ARIA, Wally.
05 01 31 54  CDR  Yes, I'm really impressed with it.
05 01 32 03  CC  I think maybe we ought to use S-band through all of our ARIA aircraft when we try ARIA.
05 01 32 09  LMP  I like - it's better than the work we've had with Tanamarive.
05 01 32 13  CC  I agree.
05 01 32 21  CDR  How long can we work this bird, Jack?
05 01 32 25  CC  We'll pick up Carnarvon here at 121 plus 33.
05 01 32 30  CDR  Roger. Do we overlap with ARIA?
05 01 32 32  CC  Affirmative. They will cut us off ARIA at that time, and I have a P27 voice PAD to give you at Carnarvon.
05 01 32 45  LMP  Roger. We'll stand by.
05 01 33 01  LMP  CARMAVON (REV 77)
05 01 33 01  LMP  Just to fill you in, Jack: I'm doing a slow - a very slow roll during the SCS. It's about pitched to about 26 degrees, and we're not getting the torquing effect we had before.
05 01 33 22  CC  Okay. Good news.
05 01 33 28  CDR  We're getting some more water out of the suits and hoses, and it may be a function of the burns to bring the water up, but obviously, we're getting it.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 01 33 39</td>
<td>CC</td>
<td>Okay. Copy it.</td>
</tr>
<tr>
<td>05 01 34 34</td>
<td>CC</td>
<td>Apollo 7, Houston through Carnarvon.</td>
</tr>
<tr>
<td>05 01 34 38</td>
<td>CDR</td>
<td>Roger. Loud and clear ...</td>
</tr>
<tr>
<td>05 01 34 42</td>
<td>CC</td>
<td>It's on the subject of water, Wally. Through the TV pass over the States, we didn't copy two - we showed that you were missing two cycles on the water accumulators there. You might have picked up some excess water due to that.</td>
</tr>
<tr>
<td>05 01 35 00</td>
<td>CDR</td>
<td>I don't think so. It's a bigger deal than that. We've been cycling off and on extra. It's been cycled whether or not you know every 10 minutes; we can't watch it every 10 minutes. We've been cycling extra passes, and we've done as much as two to three per hour extra.</td>
</tr>
<tr>
<td>05 01 35 19</td>
<td>CC</td>
<td>Okay. Copy that.</td>
</tr>
<tr>
<td>05 01 35 24</td>
<td>CDR</td>
<td>It might be worthwhile to have somebody watch it. We are in AUTO at this time.</td>
</tr>
<tr>
<td>05 01 35 29</td>
<td>CC</td>
<td>Roger. I understand, and ready on that CSM NAV vector whenever you're ready to copy.</td>
</tr>
<tr>
<td>05 01 35 42</td>
<td>CDR</td>
<td>Coming up. Stand by.</td>
</tr>
<tr>
<td>05 01 35 57</td>
<td>LMP</td>
<td>Go.</td>
</tr>
<tr>
<td>05 01 36 00</td>
<td>CC</td>
<td>Okay. CSM NAV 71 122 plus 00 plus 00 21 01605 00001 74611 57774 13503 36773 04h34 02252 52655 65527 66107 55530 11372 22031 05170 25200. The NAV check: 121 30 0000 minus 3049 plus 07891 1515.</td>
</tr>
</tbody>
</table>
Roger. Readback follows: CSM VERB 71 122 plus 00 plus 00 21 01605 00001 74611 57774 13503 36773 04434 02252 52655 65527 66107 55530 11372 22031 05170 25200. Over.

05 01 38 39 CMP NAV check readback: 121 30 four balls minus 3049 plus 07891 1515. Over.

05 01 38 50 CC You've got it correctly.

05 01 41 41 CC Apollo 7, Houston. One minute LOS Carnarvon; Guam at 121 plus 47.

05 01 41 48 CDR Roger. We've got some stars in sight. We may do a 52 after all.

05 01 41 52 CC Roger.

GUAM (REV 77):

05 01 50 58 CC Apollo 7, Houston through Guam.

05 01 51 01 CDR Roger, Houston. Loud and clear.

05 01 51 03 CC Standing by.

05 01 51 04 LMP Thank you.

05 01 51 05 CMP Jack, would you log CMP for ten clicks on the water gun?

05 01 51 09 CC CMP ten clicks.

05 01 51 11 CMP Roger.

05 01 51 49 CC Apollo 7, Houston.

05 01 51 52 LMP Go ahead.

05 01 51 53 CC It appears that your SM AUX TV switch is ON; is that affirmative?
05 01 52 00  CMP  Negative. It is OFF. Tape is ON.
05 01 52 03  CC  Roger. I understand.
05 01 52 29  LMP  Jack, this is LMP. Give me ten clicks on the water gun; and when you get a chance, can you give us a map update, please?
05 01 52 35  CC  Roger. In work.
05 01 52 38  CC  We're just about to leave you over Guam. Hawaii at 121 59; map update then.
05 01 52 44  LMP  Thank you.

HAWAII through GRAND BAHAMA ISLAND (REV 77)

05 02 00 16  CC  Apollo 7, Houston through Hawaii.
05 02 00 19  CDR  Roger. Loud and clear.
05 02 00 21  CC  Okay. I have your map update.
05 02 00 23  CDR  Go.
05 02 00 25  CC  For REV 77, the node 121 plus 69 plus 18, longitude at 148.8 degrees east, right ascension of 04 plus 28.
05 02 00 47  LMP  Roger. Jack, we haven't been using any of the right ascensions, so you can drop those unless we ask for one, if you will.
05 02 00 53  CC  Okay.
05 02 00 55  CMP  Jack, this is CMP.
05 02 00 57  CC  Go ahead.
05 02 00 59  CMP  Roger. How many of these landmarks do you have real-time coverage for?
05 02 01 04  CC  Stand by.
Apollo 7, Houston. We are covering the first two landmarks real time.

Okay.

Houston, Apollo 7.

Go ahead, 7.

Roger. We've been up here trying to deliberate whether to look at the hurricane or the second landmark. I suspect the second landmark is socked in by the hurricane, is it not?

Negative.

Okay.

Apollo 7, Houston.

Go ahead.

Roger. I have this midcourse navigation PAD to pass up whenever you are ready to copy.

We will do it later. Pretty well tied up with this now.

Okay. No problem. I'm just standing by.

Go ahead, Jack. I'll copy it.

Okay. GET start 123 plus 52, 124 plus 04, star 37, star 45, roll 000 001, pitch 356 306, yaw 001 001, shaft 019 355, trunnion 018 014, end.

Apollo 7. Do you read?

Apollo 7, Houston. Read you now. Did you copy the midcourse navigation PAD?
05 02 12 12 LMP 124 plus 04, stars 37 and 45; 000 001, 356 306, 001 001, 019 355, 018 014. Over.
05 02 12 32 CC Roger. I didn't get your readback of the first time. That should be 123 plus 52.
05 02 13 02 CC Apollo 7, Houston. Did you copy that?
05 02 13 06 LMP I didn't copy anything after I gave you the readback.
05 02 13 08 CC Okay. Walt, I didn't get the readback on the first time. The first GET was 123 plus 52.
05 02 13 18 LMP Concur.
05 02 13 19 CC Okay. Real fine.
05 02 13 48 LMP Jack, mark the LMP ten clicks of water.
05 02 13 52 CC Copy that.
05 02 14 57 CMP Hey, Jack, this is Donn.
05 02 14 59 CC Go ahead.
05 02 15 00 CMP That first landmark you gave me wasn't even within the field of view of the optics at zero roll angle.
05 02 15 06 CC Roger. Copy that.
05 02 16 46 CC Apollo 7, Houston.
05 02 16 56 CC Apollo 7, Houston.
05 02 17 15 CC Apollo 7, Houston.
05 02 17 18 LMP Go, Jack.
05 02 17 19 CC Okay. Donn, on this second landmark, we can give you a shaft and trunnion to help you out here. Shaft will be 008, and your trunnion will
be 031. This will occur when you're pitched
down 10 degrees and in ORB RATE.

Roger. Understand. Thank you. Jack, I'm going
to try to get the optics. It turns out that my
field of view in the telescope is only 38 degrees
anyway, so I might as well go ahead and use the
optics.

Okay. Real fine.

What failed me out that last time: I wasn't
aware that I needed to roll the spacecraft.
I was looking for it to the south, but it was
so far south that it was out of view.

Okay. Copy that.

Got some nice weather down there now, Jack?

Weather was pretty good when I came in, Wally.

Yes, it looks good from here.

There's just a solid overcast for a hurricane.

Roger.

There's a little bit of vortex way out here.
I'll take one shot as we're going into it.

Roger. It's moving north toward Florida.

Frame 89 - frame 88 was approaching Houston;
frame 89 is approaching the hurricane just now.

Roger. Copy.

On magazine Sierra.
HAWAII through GRAND BAHAMA ISLAND (REV 78)

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 02 20 36</td>
<td>CMP</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>05 02 20 38</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>05 02 20 40</td>
<td>CMP</td>
<td>Roger. Could you give us the shaft and trunnion for the third landmark as well?</td>
</tr>
<tr>
<td>05 02 20 44</td>
<td>CC</td>
<td>Will do. Shaft 040, trunnion 031.</td>
</tr>
<tr>
<td>05 02 20 53</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 02 20 54</td>
<td>CDR</td>
<td>There's some high cirrus way high in the forms of vortex sweeping from our left to our right and then coming back around to the north - which, of course, is the characteristic pattern - and some low solid stuff; you can almost see the eye in the center of it. I'm trying to get a picture of that now.</td>
</tr>
<tr>
<td>05 02 21 11</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 02 21 15</td>
<td>CDR</td>
<td>It's definitely a circular pattern here. We'll be going over the eye in about another - oh, I'd say, 4 or 5 seconds.</td>
</tr>
<tr>
<td>05 02 21 23</td>
<td>CC</td>
<td>Copy.</td>
</tr>
<tr>
<td>05 02 21 24</td>
<td>CDR</td>
<td>I'll try to give you a pretty good eye location. Stand by.</td>
</tr>
<tr>
<td>05 02 21 31</td>
<td>CDR</td>
<td>Mark.</td>
</tr>
<tr>
<td>05 02 21 32</td>
<td>CDR</td>
<td>That's the eye.</td>
</tr>
<tr>
<td>05 02 21 38</td>
<td>CDR</td>
<td>That's a real tight report on your hurricane.</td>
</tr>
<tr>
<td>05 02 21 41</td>
<td>CC</td>
<td>Roger, Wally.</td>
</tr>
<tr>
<td>05 02 22 11</td>
<td>CDR</td>
<td>Good weather from here.</td>
</tr>
<tr>
<td>Time</td>
<td>Type</td>
<td>Text</td>
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</tr>
<tr>
<td>05 02 23 48</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>05 02 23 50</td>
<td>CDR</td>
<td>Go ahead, Jack.</td>
</tr>
<tr>
<td>05 02 23 52</td>
<td>CC</td>
<td>Roger. We got the – at the time you read out the mark, we got a latitude and longitude, and we have passed it on to the Hurricane Center.</td>
</tr>
<tr>
<td>05 02 24 01</td>
<td>CDR</td>
<td>Roger. That's a new first on mark of hurricanes.</td>
</tr>
<tr>
<td>05 02 24 04</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 02 24 07</td>
<td>CDR</td>
<td>Fair weather.</td>
</tr>
<tr>
<td>05 02 24 22</td>
<td>CDR</td>
<td>Jack, tell the Center to send it away from that boat basin.</td>
</tr>
<tr>
<td>05 02 24 26</td>
<td>CC</td>
<td>Roger. Will do, Wally.</td>
</tr>
<tr>
<td>05 02 24 29</td>
<td>CDR</td>
<td>Tell them to get it out of the way next Tuesday.</td>
</tr>
<tr>
<td>05 02 24 33</td>
<td>CC</td>
<td>We'll do that, too.</td>
</tr>
<tr>
<td>05 02 24 36</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
</tbody>
</table>

**ASCENSION (REV 78)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 02 39 12</td>
<td>CC</td>
<td>Apollo 7, Houston through Ascension.</td>
</tr>
<tr>
<td>05 02 39 16</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 02 39 17</td>
<td>CC</td>
<td>Roger. It appears that the evaporator is dried out again.</td>
</tr>
<tr>
<td>05 02 40 30</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>05 02 40 32</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>05 02 40 34</td>
<td>CDR</td>
<td>Are we going to have a tape when we lose you here?</td>
</tr>
<tr>
<td>05 02 40 38</td>
<td>CC</td>
<td>That's affirmative, Wally. How did the last two landmark tracking points come out?</td>
</tr>
<tr>
<td>05 02 40 45</td>
<td>CMP</td>
<td>Terrible.</td>
</tr>
</tbody>
</table>
Roger. Copy.

Roger. On the second one, I relied on all optics to bring it in when it got within 38 degrees, and the thing never moved off center; so at that point, I attempted to go for it manually, and by the time I got over to it - I recognized it, and it was going so fast that high speed resolve wouldn't catch it. It got away from me. I finally picked it up just as it went outside the field of view, but it was too late to get any marks. On the third one, I loaded in the date of the landmarks up here, and when I went down on optics, it indicated that the target was completely outside the field of view to the north ... I saw the thing a little bit to the south of us. ... so what it amounts to is I got faked out three times on this stupid old optics in here.

Roger. Copy.

Now, the next time we do, I'm going to stick to the NORMAL mode, as we originally planned, and see if that works out a little better.

Okay.

Apollo 7, Houston. One minute LOS Ascension; Tananarive at 122 plus 54.

Roger.
TANANARIVE (REV 78)

05 02 54 28  CC  Apollo 7. Houston through Tananarive.
05 02 54 34  CDR  Roger. Loud and clear.
05 02 54 38  CC  Roger.
05 02 59 05  CC  Apollo 7, Houston. One minute LOS Tananarive;
                   Carnarvon at 123 plus 09.
05 02 59 13  CDR  Roger.

CARNARVON (REV 78)

05 03 11 15  CC  Apollo 7, Houston through Carnarvon.
05 03 11 18  CDR  Roger. Loud and clear.
05 03 11 20  CC  You are loud and clear.
05 03 11 22  LMP  We're starting ... pitch down.
05 03 11 28  CDR  Do you want me to put ... ball number 1?
05 03 11 37  CC  Stand by.
05 03 11 42  LMP  Roger. We're not near our perigee by any means.
05 03 11 49  LMP  We're about 80 minutes away from perigee.
05 03 11 52  CC  Affirmative.
05 03 12 05  CC  Apollo 7, Houston. Affirmative. We'd like
                   GDC on ball 1.
05 03 12 10  LMP  Roger. You've got it.
05 03 12 14  CC  Roger.
05 03 12 18  CDR  Do you have all bands or GDC?
05 03 12 26  CC  GDC.
05 03 12 28  CDR  GDC.
05 03 12 31  LMP  Jack, this is Walt. I've got a comment on this
                   food you might pass on to Frank and those guys.
This high-calorie stuff that's got everything hiked up with calories is just getting to us something fierce. In order to get a lot of calories in a small weight, everything has been hiked up, and it's all got a sweet taste. Something you think tasted real good to you, but by the time you get to the end of the bag you can't really look it in the eye very well.

Roger. I understand that.

The crux to this thing was to save stowed weight, and as a result, the food was raised in caloric count, and it's all sweet stuff.

Roger.

You also might pass on to that crew, Jack, in case they haven't selected their menu yet. I had a tendency to pick out a menu which had individual items that I liked a lot out of the samples. If I had it to do over again, I would try to make sure I had a wider variety of acceptable foods.

Okay. Copy that, Walt. We are about 30 seconds LOS Carnarvon; Guam at 123 plus 19.

Do you want to leave this on GDC ball 1?

Affirmative. We'll pick it up at Guam.

Okay.
<table>
<thead>
<tr>
<th>Time</th>
<th>ID</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 03 13 56</td>
<td>CC</td>
<td>Wally, is it about the same torque that you've observed previously?</td>
</tr>
<tr>
<td>05 03 14 00</td>
<td>CDR</td>
<td>No, we're not near perigee at this time. We want to see if we can get some data, then we'll go back and realign the GDC.</td>
</tr>
<tr>
<td>05 03 14 07</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 03 21 42</td>
<td>CC</td>
<td>Guam (REV 78)</td>
</tr>
<tr>
<td>05 03 21 43</td>
<td>LMP</td>
<td>Apollo 7, Houston through Guam.</td>
</tr>
<tr>
<td>05 03 21 48</td>
<td>CC</td>
<td>Roger. ...</td>
</tr>
<tr>
<td>05 03 21 58</td>
<td>LMP</td>
<td>Roger. Walt, I would like to have you turn your S-band AUX tape switch OFF.</td>
</tr>
<tr>
<td>05 03 22 00</td>
<td>CC</td>
<td>OFF.</td>
</tr>
<tr>
<td>05 03 22 08</td>
<td>LMP</td>
<td>Roger. Wally, we've noticed that the tailoff value that is presently loaded into the -- What was the answer, Jack, to your obtaining our TV switch ON awhile back when it was OFF? Did you find out about that?</td>
</tr>
<tr>
<td>05 03 22 19</td>
<td>CC</td>
<td>Roger. Walt, it was the tape switch that we observed on telemetry on the ground, and we thought it was the TV switch.</td>
</tr>
<tr>
<td>05 03 22 27</td>
<td>LMP</td>
<td>Okay. Understand. And is our transponder secondary completely blotched?</td>
</tr>
<tr>
<td>05 03 22 36</td>
<td>CC</td>
<td>Stand by.</td>
</tr>
<tr>
<td>05 03 22 45</td>
<td>CC</td>
<td>Apollo 7. On the secondary transponder, that's not definite yet, but we don't want to reselect it at this time.</td>
</tr>
</tbody>
</table>
Understand.

Okay. And something else that we would like to discuss here: the tailoff value that is presently loaded in the computer for the CMC is not large enough for what we have observed on your burns. We would like to load a new value into the computer with the following procedure. Are you ready to copy?

Wait one.

Roger. Jack, go ahead with your procedure.

Okay. VERB 21, NOUN 01, ENTER; 3003 ENTER; 74 ENTER. That's it.

Roger. Is that it?

That's it.

Okay ...

Could you say again, Donn? You cut out there just as you gave it.

Roger. VERB 21, NOUN 01, 3003, then 74.

Roger. That is correct.

Jack, that sounds like an SOP for that power technique.

Say again, 7.

Okay. No strain.

Roger.

Jack, this is CMP.

Go ahead, Donn.
05 03 25 19  CMP  On these landmarks tomorrow: I see we've got
three passes scheduled, don't we?

05 03 25 26  CC  Affirmative.

05 03 25 28  CMP  Okay. I would like to suggest that we devote
one pass - or at least part of a pass - to doing
some unknown landmark tracking, because I found
that up here in flight that it is fairly easy
to track any given object on the ground once you
see it. The trouble with these known landmarks
is that they are damn hard to bring in in the
first place, because either the AUTO optics
doesn't work or they are outside the field of
view sometimes. I have found that you can
track with the sextant fairly easily. So how
about running that around with the G\&N people,
and see if they are agreeable. We don't have
anything in the flight plan at all about check-
ing unknown landmark performance.

05 03 26 10  CC  Roger. Copy that. We will toss it around here
and let you know.

05 03 26 36  CC  Apollo 7, Houston.

05 03 26 37  IMP  Go ahead, Jack.

05 03 26 38  CC  Roger. We would like to zero some attitude er-
rors by taking the BMAG switches and going to
rate 2 momentarily and then back to add 1, rate 2.
05 03 26 51 CDR We are not getting much torquing this time, so there is not much sense spending - spending input on this particular area.

05 03 26 59 CC Roger. We just thought we would watch it as you went through perigee.

05 03 27 03 CDR Yes. I think what we will do is try to give it to you on the rest of this pass where we are tracking because we are going to go back through it again.

05 03 27 09 CC Roger.

05 03 27 10 CDR But we are going to face up to perigee.

05 03 27 13 CC Roger. Copy that. You've got 1 minute LOS Guam; Hawaii at 123 plus 3h.

HAWAII (REV 78)

05 03 35 06 CC Apollo 7, Houston through Hawaii.

05 03 35 09 CDR Aloha.

05 03 35 11 CC Roger. We would like to - if you're not busy with the computer, we would like to send you an update.

05 03 35 22 CDR Go ahead. Wait; hold it a second. You have got it.

05 03 35 27 CC Okay. Coming up. I'm ready with a NAV check when you are ready to copy.

05 03 35 44 CDR Go ahead.

05 03 35 45 CC Roger. 128 30 0000 minus 0266 minus 12940 0999.

05 03 36 09 CMP Roger. 128 30 0000 minus 0266 minus 12940 0999.
Roger. And on that procedure that we gave you for loading a different DELTA-V tailoff in the computer: after you get that done, we'd like you to read it out, Donn, and check it, and if you need the procedure to do that, I have it. Roger. Jack, that's just a standard erasable update. I'll do it when you get done uplinking.

Okay. There's no hurry on it.

Jack, I would like to make a comment or two regarding this star horizon business.

Okay. Go ahead.

Well, I've examined the horizon in the telescope and sextant under all different light conditions varying from total darkness to broad daylight with the sun overhead, and I can find no reliable line or band or anything in there that's repeatable at all distant sun angles. Furthermore, I know that stars in general are not visible during the daytime. About the only way you can see it is to get AUTO of the optics to pull one into the sextant for you. Obviously, if you're doing P23, you can't use AUTO optics to pull the star in there, so the chances of this thing ever working out are pretty slim, I guess.

Roger. Copy that.
Roger. I suggest that we try one run of this just to prove that it won't work and then re-group and plan to do some star-to-lunar landmark business later on in the flight somewhere.

Roger. We copy that.

It's kind of insulting to realize that the same light bands and horizons are there that we reported back in Mercury days.

Roger.

Jack, you done with your update?

Affirmative, 7. Computer is yours.

Apollo 7, Houston.

Go ahead.

Donn, on this star horizon sighting here: if you're at the roll, pitch, and yaw attitudes that we gave you and have the trunnion and shaft values that we gave you also set in, the horizon should be visible in the landmark line of sight and the star visible in the star line of sight.

... And, Apollo 7, as we lose you here over Hawaii, we're going to try ARIA on S-band. Do you want to turn up your S-band volume up? I think we may have better COMM with ARIA than Huntsville.

ARIA 3 (REV 78)

ARIA 3. Go REMOTE.
Apollo 7, Houston through ARIA.

GOLDSTONE through GUAYMAS (REV 78)

Go ahead.

Roger. Donn, we lost you just over Hawaii. Did you copy my remarks on the star horizon check?

Roger. Do you read?

...

Apollo 7, Houston.

Loud and clear.

You're loud and clear. Donn, we had an LOS there, Hawaii. Did you - were you able to copy my remarks on the star horizon check?

Roger, Jack.

Okay.

We heard you.

Real fine.

Wally, we lost - LOS Hawaii. Were you - did you get my comments to turn up S-band? We were trying to get ARIA 3 on S-band.

Negative. We missed that. I did hear you just before this last call. You tried to talk to Donn again, and it came up on S-band. We didn't hear it.
05 03 47 20 CC Okay. ARIA works so good down there in Australia on S-band that we were going to try and use ARIA instead of Huntsville to get a little better COMM.

05 03 47 30 CDR Roger. We'll try that a couple more times.

05 03 47 33 CC Okay. Real fine.

05 03 47 35 CDR What's the next time?

05 03 47 39 CC We will have ARIA 3 the next pass over - in between - about the same place.

05 03 47 49 CDR I agree.

05 03 48 00 CDR We got ARIA 3 in the flight plan. Roger.

05 03 48 45 CDR Hey, Jack, we are approaching perigee, and I'm going to give you GDC on ball number 1.

05 03 48 52 CC Roger. Copy.

05 03 48 57 CDR We're not pitched up too much local vertical; it's about 33 - 34 degrees.

05 03 49 02 CC Okay.

05 03 49 04 CDR This is a long pass; they might be able to check this thing.

05 03 49 10 CDR You've got local vertical on DSKY and GDC on number 1.

05 03 49 14 CC Copy that.

05 03 49 21 CDR And you can make note of the pitch thruster working.

05 03 49 27 CC Roger.

05 03 49 28 CDR We're in tight deadband to get this DTO done.

05 03 49 32 CC Roger.
05 03 49 34  CDR  With limit cycle ON.
05 03 49 57  CT  Guaymas LOS.

TANARIVAN (REV 78)

05 03 52 34  CDR  Houston, Apollo 7.
05 03 52 36  CC  Go ahead, 7.
05 03 52 37  CDR  Roger. On that experiment -
05 03 53 06  CDR  I stopped pulsing there, Jack.
05 03 53 10  CC  Roger, Wally.
05 03 53 12  CDR  All VHF channels are OFF.
05 03 53 17  CC  Okay.
05 03 53 23  CDR  We're now pulling up into a relative climb. We'll see what happens with this thing. Watch that pitch rate.
05 03 53 37  CC  Roger. One minute LOS Texas; Tananarive at 124 plus 27.

TANARIVAN (REV 78)

05 04 28 16  CC  Apollo 7, Houston through Tananarive.
05 04 28 20  CDR  Roger.
05 04 28 28  CMP  Houston, Apollo 7.
05 04 28 30  CC  Go ahead, 7.
05 04 28 31  CMP  Roger ... comments on that P23.
05 04 28 40  CC  Donn, we would like to wait until Guam to get your comments on the P23 - on the results of P23.
05 04 28 50  CMP  Okay. How soon is that?
05 04 28 53  CC  Guam acquisition is 124 plus 54, unless you are going to be asleep then.
I'm supposed to be; that takes almost an hour out of it, Jack.

Were ... change over.

Okay. Why don't you give them to us now, then? We don't want to interfere with your sleep cycle.

What we'll do is get a little tape and dump it.

Okay. That is fine.

Okay. There's nothing critical ... too long. It will be a lot better on tape ... I guess we could call it that.

Okay. Wally, we are having a hard time reading you here at Tananarive. Perhaps you could put your comments on the torquing as you went through perigee on the DGE tape, also, and we will dump that, too.

We'll put that on tape, and ... over Guam. I'd like to have Donn turn in by then.

I couldn't pick that up. We will dump that at the next possible time.

Roger.

Apollo 7, Houston.

Go ahead, Jack.

Roger. On the tape that is presently there, do you have any high bit rate recordings on it?

Negative.
Roger. Copy that. We will be dumping starting at Mercury and Guam and through Hawaii if needed.

Roger. When do you want S-band up for the ARIA aircraft?

The S-band with ARIA will be after Hawaii.

Roger.

Apollo 7, Houston. One minute LOS Tananarive; the Mercury at 124 plus 51.

Okay, Jack. We will talk to you then.

Roger. I'm going off duty. I'm going to give you to Ron.

That was a good show, Jack; I enjoyed it.

It was a good shift today; a good show.

Apollo 7, Houston through Mercury.

Good evening, Ron.

Good evening.

I was talking to Jack about this perigee torque problem - I think that's probably a good name for it - and we'd gone across the - well, I'll tell you about the west coast going down over Mexico south, actually over the Panama Canal Zone on the last pass.

Roger.

We're set up for a star horizon check, locked up pretty tight on 356 degrees inertial, which as
we came across the coast went to SCS zero degrees pitch. The deadband was real tight; this was in the SCS attitude hold band and MIN deadband lower range limit cycle ON. As soon as the test was terminated, I turned all SCS channels off to conserve fuel, and then I had no pitch rate, no roll rate, no yaw rates on the needles. Then about - I'd say 10 minutes, we went to perigee; it was actually to 121 hours and 51 minutes, I think it was - 123 hours 51 minutes. We start pitching up to about three-tenths of a degree per second as we approach perigee, and then it would start pitching down, and actually went back down to zero again in rate.

And when we actually went to drifting flight, the pitch was about 35 degrees up, pitch up local vertical; it went down to about minus 40 degrees or 310 to 320 degrees local vertical. That's where the rate stopped, and then it started back up slightly during the pitch. Torque was just in pitch in that case.

Roger. We copy.

That's a new one that I've never heard of before. We suspected something like that with the S-IVB and even with the Agena, but this really showed it to us.
Another interesting thing we saw as we went down through South America: we'd seen the hurricane earlier today, went right over it, in fact. You could see the eye of it as a little depressed dimple in the center of the hurricane.

All the dense thunderheads as we went over South America had flat tops and rather large ones, and they had little depressions in the center just like the hurricane, and had the reversed flow pattern on the flat tops, which you would expect in the southern latitudes - the reverse coriolis effect.

That's interesting.

I'd never heard of that effect before, you know, on the top of a thunderstorm.

I hadn't either.

All of Donn's experiments bombed.

The horizon isn't as good as everybody says it is, although those of us who have flown said it's exactly the way it is right now.

I'm sorry to define the star-to-horizon check didn't work. The landmark optical tracking didn't work. We tried to use AUTO optics, and
they did not bring it in. Tomorrow we're going to ... 

GUAM (REV 79)

05 04 56 19  CDR  What do you have for us?
05 04 56 26  CC  I missed your - in the handover there, your star horizon didn't work, and everything after that, Wally.
05 04 56 38  CDR  Houston, Apollo 7.
05 04 56 41  CC  Apollo 7, Houston. Go.
05 04 56 43  CDR  Roger. Did you get the last?
05 04 56 44  CC  Negative. I missed everything after Donn's horizon not got and the star horizon didn't work.
05 04 56 51  CDR  That's correct. And the program 23 didn't work, and it wasn't designed to work on the earth orbit and particularly on the SUNDISK. We lost that fight on the ground, but I think we won it up here.

05 04 57 05  CC  Roger.
05 04 57 07  CDR  There's always a question of using up fuel on it. We're going to try tomorrow, unknown landmarks.
Known landmarks did not work; the AUTO optics did not bring them in, and they're hard to find, particularly in the earth-orbit position.
05 04 57 30  CC  Roger. We're working up the chart now for you for tomorrow.
05 04 57 33  CDR  Very good. How was the day back in Houston?
05 04 57 39 CC  It was a nice day here.
05 04 57 41 CDR  Very good. Looked good to us.
05 04 57 45 CC  Apollo 7, Houston. Opposite omni.
05 04 57 47 CDR  Roger.
05 04 58 03 CDR  We spend our quiet evenings in at this time preparing our next TV show, and we'll have one for you tomorrow.
05 04 58 12 CC  Very good.
05 04 59 14 LMP  Hey, Ron. You got time to give us a chart update?
05 04 59 17 CC  Roger. Stand by. And, Walt, BIOMED to your position.
05 04 59 25 LMP  Got it.
05 04 59 30 LMP  You guys better watch the waterboiler pretty close. We had it going dry on us numerous times for several days, and it seems to happen over a period of about 4 seconds ...
05 04 59 49 CC  Roger. You say it seems to happen over a period of 4 seconds?
05 04 59 54 LMP  Oh, about 30 seconds time if you go from operating normally to tank low on the steam pressure, it seems like.
05 05 00 04 CC  Roger. We'll keep a close eye on it then.
05 05 00 48 CC  Apollo 7, Houston. About 30 seconds LOS; Hawaii at 09. Leave your map update and block data at that time.
05 05 00 57 LMP Roger. And we won't need the right ascension, Ron. We really don't make any use of it, so unless we ask for it, why don't we just skip those right ascensions?

05 05 01 07 CC Oh, Roger. I concur.

HAWAII (REV 79)

05 05 11 48 CC Apollo 7, Houston, Hawaii.

05 05 11 48 LMP Roger. Ron, I'm ready to copy the update.

05 05 11 54 CC Roger. Your map update: REV 79, GET 124 plus 47 plus 02, longitude 103.3 east.

05 05 12 17 LMP Roger. Ready to copy block data.

05 05 12 20 CC Roger.

05 05 12 28 CC Apollo 7, Houston. Block data number 14: 081 dash 3 Alfa plus 312 plus 1360 127 plus 45 plus 11 3382, 082 dash 3 Alfa plus 302 plus 1360 129 plus 21 plus 34 3524, 083 dash 3 Bravo plus 253 plus 1340 130 plus 53 plus 56 2856, 084 dash Charlie Charlie minus 076 plus 1700 132 plus 33 plus 15 1858, 085 dash Alfa Charlie plus 072 minus 0220 133 plus 19 plus 17 4077, 086 dash 2 Charlie plus 184 minus 0250 134 plus 53 plus 55 3706. Houston, over.

05 05 14 44 LMP I didn't copy the last three. Will you give it to me again?

05 05 14 47 CC Roger. Area 086 dash 2 Charlie plus 184 minus 0250 134 plus 53 plus 55 3706. Over.
Roger. Readback follows: 081 dash 3 Alfa plus 312 plus 1360 127 plus 45 plus 11 3382, 082 dash 3 Alfa plus 302 plus 1360 129 plus 21 plus 34 3524, 083 dash 3 Bravo plus 253 plus 1340 130 plus 53 plus 56 2856 · 084 dash Charlie Charlie minus 076 plus 1700 132 plus 33 plus 15 1858, 085 dash Charlie plus 072 minus 0220 133 plus 19 plus 17 4077, 086 dash 2 Charlie plus 18 - didn't get the last number - minus 0250 134 plus 53 plus 55 3706. Over.

Roger. Your latitude for area 086 dash 2 Charlie is plus 184.

Roger. Plus 184. And Wally's got a failure to report on his harness. He had one lead that was coming loose. He put it together the last time and taped it to keep it there, and apparently, it's now in a state of failure down where it goes into the body connector at signal conditioner, and he wants to know can they receive data on him with only his three good sensors. Over.

Roger. What's the color of the signal conditioner that there's a plug that it's going into?

The white one or the yellow one?

It's the lower external lead.

Roger. Stand by.

It's the blue signal conditioner.
HUNTSVILLE (REV 79)

05 05 18 06  CT  Huntsville AOS.
05 05 18 24  CC  Apollo 7, Houston.
05 05 18 30  CC  Roger. Real weak, Walt. We can work up a swap of the signal conditioners or the leads going to the signal conditioners, and we'll try to pass that up to you over Tananarive.

05 05 18 50  LMP  Okay. Thank you.
05 05 18 56  CC  Sorry about that.
05 05 18 59  LMP  Roger. Thank you.
05 05 19 57  LMP  This is Apollo 7. How do you read me, Ron?
05 05 20 03  CC  Apollo 7, Houston. We're reading you through Huntsville. We had ARIA just between Hawaii and Huntsville when you were reading back on the block data, and it was good at that time.

05 05 21 11  CT  One minute to ...

GUAYMAS (REV 79)

05 05 22 35  CC  Apollo 7, Houston. Did you call?
05 05 22 38  CT  Negative, Ron. Just standing by.
05 05 22 42  CC  Roger. About 1 minute to LOS now. Tananarive at 01.
05 05 22 47  CDR  Roger.
05 05 22 58  CDR  Did you catch our TV pass today?
05 05 23 00  CC  Affirmative. It was a good one again. The quality wasn't quite as good as it was the other
2 days. I've got some dope on that ALC switch
I'll try to pass up to you sometime this evening.

Okay. It never seems to work as good with the
ALC in.

Apollo 7, Houston through Tananarive.

Roger, Ron. Reading you five-by. How me?

Roger. Not too bad this time, Walt. Have a
little question on the chlorination. Have you
chlorinated yet?

No, and it's not our intention to chlorinate
today. We chlorinated yesterday. You don't
have any objections to chlorinating every other
day, have you?

Roger. I understand you're intent on the thing.
Do you still have a bad taste in it? Is this
the reason?

We're just now starting to feel well enough
about cold, and the water has tasted horrible...
as we can and when we chlorinate, the taste
of it afterward is very bad for several hours,
and it's not really good for a ... cold.

Okay. We understand and do not chlorinate today.
We'll pass it today and chlorinate tomorrow.

Okay. Very good. I think that's a pretty sensi-
ble schedule. We'll catch the chlorination
tomorrow. Got two questions for you, Ron, and ...

05 06 06 22  CC  Say again.
05 06 06 24  LMP  One, what is the precise inclination of our orbit? And second, we'd like to get a chart update for our RCS chart onboard.
05 06 06 38  CC  Roger. What is the precise inclination of your orbit? Is that what you said?
05 06 06 43  LMP  Right. And Wally would like to hear the BIOMED sensors because he's getting shoot it up again.
05 06 06 52  CC  Roger. We'll get your inclination on your BIOMED sensors. Walt, your inclination is 31.25.
05 06 07 10  LMP  Roger.
05 06 07 11  CC  And on your BIOMED sensors, what we want to use - or use the two good ones in the middle of your chest, and those two good ones will have to be connected to the blue signal conditioner, which means you're going to have to switch to wires that go into the signal conditioners.
05 06 07 34  LMP  Okay. You want the two sternal leads to go to the blue signal conditioner, right?
05 06 07 42  CC  Yes, that's affirmative.
05 06 07 45  LMP  Okay. That means Wally will have to connect the connector of the other signal conditioner and use that lead to the sternal.
05 06 07 52  CC  That's affirmative. That's affirmative.
Okay. He'll try. If that doesn't work, we will just have to write it off, because he has been trying to piece that thing together for the last 126 hours. He'll try it.

Roger.

Apollo 7, Houston. One minute LOS; Mercury at 24.

Roger. And when you can get it, we would like an update for onboard RCS chart.

Wilco. We will have it available at Mercury.

Apollo 7, Houston through Mercury.

Roger, Ron.

Okay. I got your RCS update for figure 3 dash 1.

Roger. Go with it.

Roger. At 126 hours, total is 688 pounds, SCS redline 601, DAP redline 536, hybrid 263. And be advised that quad A is still right on the SCS redline. The rest of them are above.

Quad A. I thought quad C was the first one we were going to be switching.

Roger. Stand by, Walt.

And, Ron, I was given some numbers today that what the onboard meters should read when we switch to secondaries. Is that going to be open loop; and when I get down to that reading, I should switch; or will you be giving me later dope on switching?
We're keeping track of it, Walt, and will probably be giving you later dope on it, but those are the figures that we have at this time.

Roger. And I was told that C was the closest to getting on the secondaries.

That is affirmative. As far as your onboard reading is concerned, it's 54 percent for C, 49 for D Delta, and A is 46 percent.

Roger.

Apollo 7, Houston. Request you cycle O2 tank two fan ON for 5 minutes and then OFF.

Roger, Ron.

And when you get a chance, you can read out your service module RCS propellant quantities and your system test meter 5 A through D and 6 A through D.

Roger. And I'll give you the quantities right now before I forget it. Can you have them standing by when we are coming over Hawaii to check Wally's BIOMED readouts?

Wilco.

Okay. A through D: reading 51, blank 55 plus and 58. Over.

Roger. Copy.

Say again the number for my chart?

Roger. The total for your chart is 688.

Roger. 688. I will give you the test meter readouts.
Roger.

Okay. For 5 C is 5 volts. Five D is 5 volts, 6 Dog 5, 6 Charlie 4.8, 6 Baker 5, 6 Able 5. Over.

Roger. You have 5 Alpha?

Okay. Five Alpha is 1.7.

Say again.

Which should be on the order about 70 - degrees Fahrenheit, I believe.

Roger. Was that 1.7?

That is affirmative. 1.7.

Roger. And I have your ground compute usable RCS propellant remaining if you would like those.

Okay. Go with them.

Roger. It will be 46 percent, 50 percent, 45 percent, and 52 percent - A through D.

Forty-six, 50, 45, 52?

Roger.

How did you ever get Baker to be 50 and Dog to be 52?

I am not quite sure, but it works out that way.

...

LOS. I think I missed you.

HAWAII (REV 80)

Apollo 7, Houston through Hawaii. Standing by.

Roger. We read you loud and clear.
05 06 43 50  CC  Roger. Loud and clear.
05 06 45 22  LMP  Hey, Ron, log the CMP with how many?
05 06 45 27  CC  Say again.
05 06 45 36  CC  Apollo 7, Houston. Say again.
05 06 45 38  CDR  Would you log CMP with about 50 clicks for the last 5 hours.
05 06 45 45  CC  Fifty clicks you say in the last 5 hours?
05 06 45 47  CDR  Five-zero.
05 06 45 48  CC  Roger.
05 06 45 49  CDR  And CDR 30.
05 06 45 52  CC  Roger.
05 06 45 53  LMP  LMP 15.
05 06 45 56  CC  Roger.
05 06 46 00  CDR  How's Sir John doing with my BIOMED?
05 06 46 04  CC  Roger. Looks like you're getting the AUXILIARY, the ones under your arms there going into the blue signal conditioner which is okay. We can do - we can do with that one.
05 06 46 18  CDR  That's what you asked for, isn't it?
05 06 46 22  CC  Not quite, but that's okay. With what we're trying --
05 06 46 25  CDR  I thought you wanted the two sternals to go into the black and the two AUXILIARY into the blue.
05 06 46 37  CC  No, we thought the broken wire was from the two sternal ones going into the blue --
05 06 46 46  CDR  I think the low sternal is broken.
Okay, okay. I see what you're saying. The lower sternal is broken, but what we're trying to do — was get the two sternal ones to go into the blue signal conditioner.

That's how they were originally.

Yes, right. But we wanted to switch the pieces of wire that go into the signal conditioner, the AUXILIARY wires that go into the signal conditioner — into the black signal conditioner. We wanted to use that lower piece of the wire and hook that piece of the wire to the center sensors.

I won't have you change my spark plugs.

(Laughter) Okay. It's working okay the way it is. It's fine.

Okay.

The good doctors say, "Thank you."

Roger.

You know Wally, anything for the doctor.

Roger.

Say, I've kind of lost track. Is this day 8 or day 9?

I have to — wait one.

I got a time hack to end of mission, if you'd like that.

I was trying to figure out how to get a big clock to count down.
05 06 48 40 CC (Laughter).
05 06 48 44 CDR Go ahead.
05 06 48 46 CC Roger. Stand by for 132 hours and 51 minutes.
      Five, four, three, two, one.
05 06 49 00 CC MARK.
05 06 49 01 CC 132 hours and 50 minutes.
05 06 49 03 CDR Beautiful. Is that drogues or mains?
05 06 49 17 CC That's to GETI burn 8.
05 06 49 22 CDR Oh, we got more to go?
05 06 49 24 CC Yes.
05 06 49 26 LMP What's the 6-day forecast on hurricane what's-its-name.
      HUNTSVILLE (REV 80)
05 06 51 18 CC Apollo 7, Houston.
05 06 51 40 CC Apollo 7, Houston.
05 06 52 16 CC Apollo 7, Houston.
05 06 52 48 CT On Houston to Huntsville, GSM question.
05 06 52 57 CC Apollo 7, Houston.
05 06 53 25 CC Apollo 7, Houston.
05 06 54 01 CC Roger. Wally, be advised on Gladys. We're not sure whether to move your boat or to move your landing point yet.
05 06 54 20 CT Huntsville LOG.
      TANANARIVE (REV 81)
05 07 32 52 CC Apollo 7, Houston through Tananarive.
05 07 32 56 LMP Roger, Ron.
Roger. I have your present battery status, ampere-hours remaining.

Roger. Read it.

Roger. Alfa 31.4, Bravo 29.0, Charlie 39.5.

Roger. Thank you. The way those numbers change, the only ones that are consistent are the ones you get earlier sometimes.

I missed that. Say again.

Roger. The battery numbers.

Roger.

Ron, I have a comment to pass on to Tananarive. Dumped the waste water there. ... disconnect. It failed to a 2B setting over by the waste water control panel, and when we dumped the waste water, a large puddle of water formed there. ... run that, and it performed pretty good, only ... could make a big difference.

Apollo 7, Houston. I can't make too much out of that, other than there was a large puddle of water by the water fitting on the waste water disconnect.

Roger. That's affirmative. And you might look into putting a different type fitting back into the water control panel to solve the problem of water leaking there every time I dump.
05 07 38 55    CC    We'll play back our tapes. Maybe we can read it off the tapes. I couldn't read you that time.

05 07 39 32    LMP    Hey, Ron, we got several nice pictures of the west coast of Chili as we passed over last night.

05 07 39 41    CC    Roger. That's good.

05 07 39 43    LMP    Floor 93 through 97 on magazine S.

05 07 39 50    CC    Roger.

05 07 40 39    CC    Apollo 7, Houston. Did you receive my comments on Hurricane Gladys?

05 07 40 48    CDR    Roger. I understand it's ...

05 07 40 52    CC    Roger. In reality, it's due to hit Tampa at 18 00 Z tomorrow, on Thursday.

05 07 41 11    CDR    ... Ron?

05 07 42 09    CC    Apollo 7, Houston. One minute LOS; Mercury at 59.

MERCURY (REV 81)

05 08 01 39    CC    Apollo 7, Houston through Mercury.

05 08 01 45    CDR    Roger. Loud and clear.

05 08 01 46    CC    Roger. Same here. I have a one-line flight plan update.

05 08 01 58    CDR    Go ahead, Ron.

05 08 02 00    CC    Roger. At time 130 plus 00, an oxygen fuel cell purge.

05 08 02 16    CDR    Roger. At about the half-way mark, go to fuel cell purge.
Roger. And, Wally, if you want to go back to Walt on the BIOMED, that'll get us squared away on the flight plan again.

Okay.

You got it.

Roger. Copy.

We had one more bag failure: orange juice reconstitutable bag. I think Walt was trying to add some prune juice to it.

It was the best thing in my dinner, too.

You didn't get the PT then, did you?

Oh, very good. You're fighting back.

Apollo 7, Houston. We've got about 70 knots of wind in the eye of Gladys.

Roger.

HAWAII (REV 81)

Apollo 7, Houston, Hawaii. Standing by.

Roger.

Roger. We read you.

Hey, Ron.

Roger. Go --

We'll do the redundant component check on the next pass over the Mercury, okay?

That's fine.

Okay. We are trying to eat dinner now.

Roger.
05 08 24 24 CC One minute to LOS; Redstone at 34.

REDSTONE (REV 81)

05 08 34 24 CC Apollo 7, Houston. Redstone standing by.
05 08 34 28 CDR Roger.
05 08 34 29 CC Roger.
05 08 34 31 LMP Hey, Ron. Can you give us a readout on our
O2 manifold pressure on my mark?
05 08 34 38 CC Wait one. I don't have it yet.
05 08 35 10 CC Wait, we've got kind of a low signal strength
here. We're trying to get high bit rate now.
05 08 35 16 LMP Okay ....
05 08 35 21 CC Roger. I'll let you know if we get it.
05 08 35 30 CC Apollo 7. You want to try opposite omni?
05 08 35 59 CC Roger. We're reading 105 now.
05 08 36 04 CDR ...
05 08 36 16 CC Wait, Wally, we've lost it again.
05 08 36 27 CC We're about 1 minute to LOS; we'll pick it up
over Mercury next time.

MERCURY (REV 82)

05 09 34 50 CC Apollo 7, Houston through Mercury.
05 09 34 55 LMP Roger, Houston.
05 09 34 57 CC Roger. Loud and clear.
05 09 35 00 LMP Want to make a readout of our manifold pressure?
05 09 35 04 CC Roger. Stand by. We have no data yet.
05 09 35 45 CC 7, Houston. Looks like we've got a processing
problem here for a little bit. I've got the
results of what we feel on the evaporator, if you would like to hear it.

Roger. I'd be very interested.

Roger. When we're operating under low cyclic loads - cyclic heat loads, as we have been doing, the evaporator will dry itself out. This is basically caused by the evaporator boiling more water under low heat loads than is being supplied to it. The end result is drying of the evaporator. If the evaporator is left in AUTO, the back pressure valve remains open and completely evacuates the evaporator. When the water valve is now opened either automatically or manually, the first water that goes into the evaporator flash freezes. This stops any more water from getting into the evaporator until it thaws out. A couple of more comments: we feel the boiler will work normally, should it be called upon to take the entire heat load. Since the radiators have demonstrated that they could handle the heat load, should the evaporator foul up again, it should be reserviced and turned off until it is needed.

Roger. Ron, there's only one comment I have to add to that that makes sense. I assume with high heat load then, we wouldn't have any problem. We do notice the difference in temperature
in the spacecraft when the evaporator is running or not, but it seems like it runs a little bit all the time when it's on the line. The glycol evaporator outlet TEMP is regulated down under 45 most of the time. In the drop line completely well, we have a glycol evaporator outlet TEMP of 50 to 52 and sometimes a little higher.

Roger. We copy that.

So next time it shuts down, I will service it, and we will stand by on it.

Roger. Have any data yet?

I got a little bit, right. We're sending the command for high bit rate. Stand by.

Okay. Looks good. We're reading 104 now.

Roger. What are you reading now?

103.

Roger. The redundant component check is A-okay.

Roger. Wow!

He's close to being fired, Ron. How do I get rid of him? (Laughter)

REDSTONE (REV 82)

Apollo 7, Houston, Redstone.

Roger.

Apollo 7, Houston. We would like to cycle O2 tank 2. Turn it on shortly and then we would like to see the OFF before we complete this pass.
05 10 06 22  LMP  Was that the $O_2$ fan, Ron?
05 10 06 25  CC   I'm sorry; $O_2$ fan.
05 10 06 28  LMP  Roger. I'm running a DTO now, the one for the
                 60 percent on the CRYO tank. I've got both fans,
                 both heaters OFF. I'm assuming when I finish this
                 run on it that that DTO is complete. Can you ver-
                 ify that for me?
05 10 06 42  CC   Roger. Negate my last on the fan switch, and
                 we'll verify that shortly.
05 10 07 29  CC   Apollo 7, Houston.
05 10 07 32  LMP  Go ahead.
05 10 07 33  CC   Roger. That does complete the 60 percent. We
                 still have one more at the low end prior to re-
                 entry where it doesn't work out, doesn't conflict.
05 10 07 46  LMP  The onboard copy of the DTO, which I assume you
                 have there, shows only 90 plus or minus 5 and
                 60 plus or minus 5 or last day.
05 10 08 04  CC   Roger. We'll check on it now.
05 10 08 48  CC   Walt, it looks like on the DTO there, that "or
                 last day" should have been "and last day."
05 10 08 57  LMP  Okay. I'll give you a hack on how long it takes
                 to run this, and we'd like to find out if we
                 can't work it in the last day. We'll see.
05 10 09 04  CC   Roger. Thank you.
05 10 09 06  LMP  I started it at about 129 hours and 45 minutes,
                 I guess.
05 10 09 14 CC Roger.
05 10 09 47 LMP Ron, do you have time to give us a map update?
05 10 09 51 CC Roger.
05 10 10 39 CC Apollo 7, Houston. You ready to copy?
05 10 10 45 LMP Go ahead.
05 10 10 47 CC Roger. REV 82, GET 129 plus 13 plus 13, longitude 35.1 east.
05 10 11 08 LMP Ron, you cut out. Could you try it again?
05 10 11 11 CC Roger. GET 129 plus 13 plus 13, longitude 35.1 east, REV 82.
05 10 11 28 LMP Roger. I got it.
05 10 12 26 CC Apollo 7, Houston. Thirty seconds LOS; Ascension at 31.

ASCENSION (REV 83)

05 10 31 05 CC Apollo 7, Houston through Ascension.
05 10 32 05 CC Apollo 7, Houston.
05 10 32 45 CC Apollo 7, Houston.
05 10 33 11 CC Apollo 7, Houston.
05 10 33 50 CC Apollo 7, Houston.
05 10 34 45 CC Apollo 7, Houston.
05 10 35 40 CT Voice Control, this is --
05 10 36 11 CC Apollo 7, Houston.
05 10 36 47 CC Apollo 7, Houston.
05 10 37 36 CC Apollo 7, Houston.
05 10 38 35 CC Apollo 7, Houston. Transmitting in the blind.

We have fuel cell 2 O2 flow ON.
05 11 08 13  CC  Apollo 7, Houston through Mercury.
05 11 08 18  CDR  Roger. Go ahead.
05 11 08 21  CC  Roger. Read you.
05 11 08 23  CDR  Thank you.
05 11 08 31  CC  7, Houston. Got a couple of onboard readouts
                 I would like to cut.
05 11 08 38  CDR  Go ahead.
05 11 08 39  CC  Roger. Pyro battery voltages and batt C volt-
                 age.
05 11 08 51  LMP  Hey, Ron. We read the pyro battery voltage a
                 little earlier this evening and passed it down.
                 I guess it was before your shift, but they were
                 both reading 37 volts.
05 11 09 01  CC  Roger. I missed it; sorry.
05 11 09 08  LMP  Battery C is 36 volts.
05 11 09 13  CC  Roger. Copy. And could you check your O₂ purge
                 switch on fuel cell 2?
05 11 09 31  LMP  Thank you, Ron.
05 11 09 49  LMP  Hey, Ron. What are you guys reading out for the
                 O₂ tank pressures?
05 11 09 58  CC  O₂ tank pressures?
05 11 10 01  LMP  Right. I've got the ... on.
05 11 10 32  CC  Apollo 7, Houston. We're reading 846 on tank 1
                 and 827 on tank 2.
05 11 10 41  LMP  Roger. Thank you.
05 11 10 57 CC
7, Houston. The O2 flow looks good now on fuel cell 2, and you can continue with 3. And we could use a general rundown on your crew health, the medication, and the amount of sleep, what have you.

05 11 11 16 LMP
Well, this is the LMP. I had another Actifed the night before last. That makes two I've had. My ears are getting more difficult to clear than they have been. Sometimes I can clear one, and sometimes I can't. I feel very good otherwise. I'm a little bit concerned about the lack of any nose drops such as Neo-synephrin on board, and it seems to me if we had something like that, we'd be able to at least make a stab and let my ears get cleared on the reentry.

05 11 11 54 CC
Roger. Copy that. Opposite omni, Apollo 7.

05 11 12 05 CDR
Roger. We just got a group of islands on frame 97, magazine Sierra. That is at 13 hours 11 minutes and 40 seconds.

05 11 12 23 CC
Roger.

05 11 12 32 CMP
Hey, Ron. My sleep last night: I got, oh, about 7 hours of sleep which was very sound sleep, the best I've got coming up here, I guess.

05 11 12 42 CC
Roger.
05 11 12 46 CDR I think we've all been averaging good sleep lately. Donn's been sleeping much better. He was the one who was way behind on sleep. And because we switched his day to - to go to bed at night at 4 o'clock which is pretty clever for anybody to try.

05 11 12 59 CC Right.

05 11 13 02 CDR And he is finally acclimated to that schedule. All three of us have varying forms of cold - various forms of cold. Mine is still a head cold, and that's about my problem. I'm off pills these days.

05 11 13 16 CC Roger.

05 11 13 27 LMP What do the doctors have in mind for head clearing on reentry?

05 11 13 34 CC We're counting on three Actifed.

05 11 13 42 LMP You mean three per man?

05 11 13 46 CC (Laughter) Negative. One each, Donn.

05 11 13 53 LMP Why don't you suggest to 'em that they do that as flight surgeons for airplane drivers? I haven't seen that work yet.

05 11 14 02 CC Roger. We would use a hole in the helmet probably, couldn't we?

05 11 14 09 CDR I think that's what you're going to find. We'll come in with our helmets off.

05 11 14 17 CC Roger. We will advise.
You could try. How's that for a B-52 status report? (Laughter)

Apollo 7, Houston. I've got a couple of comments on TV.

Go ahead.

Roger. On the ALC switch —
... go ahead, Ron.

Roger. On the ALC switch, have it out — ALC out— when the windows or flood lights are in the field of view or when you're panning across the spacecraft. This will give a better picture of the darker areas.

And, of course, have it in when light sources are not in the field of view.

Okay.

And when the flashlight — down there — when the flashlight shines directly on an area, this area only shows up as a white blob. So it's good for pointing, but it doesn't help the picture at all.

Okay. Let's see, we'll dolly up and — on our screen ... tomorrow morning.

Roger.

Walt, the doctor recommends one more Actifed prior to sleep tonight, if you feel necessary.

I don't feel like it does me a bit of good.
05 11 16 56 CC  Roger. We still feel it'll probably help a little though.

05 11 17 00 LMP  For the last 2 or 3 days, there's been a heck of a lot. We don't have that much on board. We got enough for pain and seasickness and stuff like that, but nothing for colds.

05 11 17 23 CC  Roger. We're kind of in the same position down here, also, when you get a cold.

05 11 17 29 LMP  Roger. That's right.

05 11 18 50 CC  Apollo 7, Houston. One minute LOS; Redstone at 39.

05 11 18 55 CDR  ...just off the China coast in the East China Sea.

05 11 19 03 CC  Say again, missed that.

05 11 19 05 CDR  The islands I recorded are just off the East China coast.

05 11 19 14 CC  Roger.

REDSTONE (REV 83)

05 11 38 30 CC  Apollo 7, Houston, Redstone. Standing by.

05 11 38 36 CDR  Roger.

05 11 38 40 CC  Roger. Loud and clear.

05 11 43 16 CC  Apollo 7, Houston. We'll log about now for a completion of your stratification tester.

05 11 43 28 CDR  Roger.

05 11 43 39 CC  The good old U.S.A. got another gold medal tonight: Tommy Smith in a 200-meter race in a time of 19.78.
05 11 43 53  LMP  My gosh! They're a new ...
05 11 43 55  CC  Roger.
05 11 43 58  CC  We just got another one: Bob Seagren in a pole
vault with a height of 17 feet 8 and 1/2 inches.
05 11 44 13  LMP  Say, things aren't too dull down there?
05 11 44 16  CC  Right.
05 11 46 03  CC  Apollo 7, Houston. One minute LOS Redstone at
Ok, and, Wally ...  
05 11 46 09  CDR  Roger. ... K2 watchband in. Thank you.
05 11 46 12  CC  Roger. You can rest in peace tonight; the
Chronicle described the flight of Apollo 7 to
date as high quality.
05 11 46 22  CDR  Wow! Boy, we ought to quit while we're ahead.
05 11 46 28  SC  We're over the hill on the halfway anyway, and
that's a good sign.
05 11 46 31  CC  That's affirmative.

ASCENSION (REV 8h)

05 12 05 32  CC  Apollo 7, Houston through Ascension.
05 12 05 38  CMP  Roger. Ron, good morning.
05 12 05 40  CC  Good morning. How's the night's sleep?
05 12 05 51  CMP  Hey, Ron. You got any dope on the Olympics this
morning?
05 12 05 57  CC  Say again, Donn.
05 12 06 00  CMP  We were just wondering who were the latest gold
medal winners down in Mexico.
Roger. Like to check a couple of switches there first, and then I'll pass it up to you. Can you check your O2 tank 1 and 2 heater switch to the AUTO position?

Roger. Ron, I got 1 in AUTO and 2 OFF.

Roger. Are those the heaters or fans?

Fans.

Roger. Those are - fans are correct. How about the heater switch? Are they both in AUTO?

... you want them OFF?

Negative. We want them in the AUTO position.

Donn, we had a couple of Gold Medal winners down there tonight. Bob Secru - Seagren, I'm sorry - won at pole vault at 17 feet 8 and 1/2 inches.

Pretty tall reach.

Roger. And Tommy Smith won the 200 meter in 19.78.

Moving on, isn't it?

Roger. And opposite omni.

Hello, Houston to Apollo 7.

Houston. Go.

Roger. Regarding the medicants and antibiotics and so forth, one of the reasons we don't have a temperature up here is that the thermometer is broken. We can't get it to go over 94, so we don't know if we've got a fever or not.

Roger. Understand.
Apollo 7, Houston.

Roger. Go.

Roger. Be advised on your CMC power up. We'll update you a little later, but what we are going to try to do is to power it up over one station and then power it down over the other station, so we can take a look at some of the bits in there.

Roger. Understand.

And we got a pretty good status of the other two guys' health. Can you give us kind of your rundown: health, medication, and sleep?

Roger. I just woke up. I got a good solid 8 hours sleep, and Walt and Wally are both in the sack, and I don't know, I think they may have called in their medicine.

Yes, we have theirs, but we didn't get yours.

Okay. At 132 hours, they each had two aspirins, and LMP recorded 15 clicks of water.

Roger.

And I haven't had a drink yet, and I haven't taken any medicine lately.

Roger.

Also, the commander had 20 clicks of water at 131 30.

Roger.

About 30 seconds LOS; Mercury at 11.
Roger.

05 12 12 47 CMP

Apollo 7, Houston. You might try center position BIOMED.

05 12 13 06 CC

Center position of what?

05 12 13 14 CMP

BIOMED switch.

05 12 13 16 CC

MERCURY (REV 84)

05 12 41 35 CC

Apollo 7, Houston through Mercury.

05 12 41 40 CMP

Roger.

05 12 41 43 CC

Roger. Loud and clear, Donn.

05 12 41 45 CMP

Okay.

05 12 41 49 CMP

Ron, I've got a couple of comments here that's relevant to program 23 navigation ...

05 12 41 56 CC

Roger. Go.

05 12 41 58 CMP

Okay. The reason we knocked that off yesterday was that when we got into attitude at the right time and everything ... and the horizon and such in the sextant. The fixed line of sight was very indistinct. In fact, it was pretty hard to pick out anything that you could use. There was one line that might pass for a repeatable line, but it was pretty tenuous. Subsequent to that, I did a P52 AUTO optics check and found that the star was up there, but it was at a slightly different shaft and trunnion angle. That was the reason we didn't pick it up.

05 12 42 35 CC

Roger.
So the gist of it all was that I don't think it was too worthwhile or realistic a way to perform that program, or it wasn't designed to be used that way, so I suggest that if we have any time or fuel later in the flight, we try to use the lunar landmarks and stars.

Roger.

Houston, Apollo 7.

Houston. Go.

Roger. You were making some comments awhile ago regarding power up and power down on the computer.

Roger.

When did you want to do that? Are you talking about the normal power up for the next sequence of activity?

Negative. The CMC update is about 135 hours, somewhere around there.

Oh, yes. Okay.

We could do it now and power down over the Canaries.

Roger. Stand by.

Roger. Donn, you can go ahead and power it up now. We'll power it up over Guam and then power down over Redstone.

Okay.

Well, that's cute.
05 12 47 10 CMP We got a restart light.
05 12 47 20 CC Roger. That's normal.
05 12 52 43 CC Apollo 7, Houston. One minute to LOS; Redstone at 13.
05 12 52 50 CMP Roger.
05 12 52 52 CC And you passed the halfway mark while you were asleep there.
05 12 52 55 CMP Yes, that's great. Do you want me to power down the computer now or wait?
05 12 52 59 CC Negative. Let's wait until we get to Redstone.
05 12 53 03 CMP Okay. I'll just let it simmer.
05 12 53 05 CC Roger.

REDSTONE (REV 84)

05 13 14 10 CC Apollo 7, Houston through Redstone.
05 13 14 15 CMP Roger, Houston.
05 13 14 17 CC Roger. Loud and clear.
05 13 14 33 CC Apollo 7, Houston. You can power down anytime on the CMC and just prior to LOS, sometime in there.
05 13 14 41 CMP Okay.
05 13 17 52 CC Apollo 7, Houston. Opposite omni.
05 13 17 55 CMP Roger.
05 13 19 22 CC Apollo 7, Houston.
05 13 19 28 CMP Roger, Houston. Go.
05 13 19 30 CC Roger. Looks like your back pressure valve is open now. Would you manually close the back pressure control valve?
05 13 19 42 CMP Roger. Close it.
05 13 19 43 CC Wait 15 minutes; then reservice it and leave it off the line.
05 13 19 51 CMP Okay.
05 13 20 05 CMP Would you log me 30 clicks on the water gun and two aspirins, please?
05 13 20 15 CC Missed the clicks. Say again.
05 13 20 20 CMP Thirty clicks on the water gun and two aspirins.
05 13 20 22 CC Roger.
05 14 47 15 CC Apollo 7, Houston.
05 14 47 18 CMP Hello dere.
05 14 47 22 CC Roger. This is Captain Moko from deep in the trenches of the MOCR. I've got a block data update for you, Donn.
05 14 47 31 CMP Okay. Sure. (Laughter).
05 14 47 40 CC I'm a big TV fan of yours now, Donn.
05 14 47 43 CMP Say again.
05 14 47 44 CC I say I'm a big TV fan of yours. I even had my wife wake me up this morning to watch it.
05 14 47 49 CMP Oh, is that right? Well, go ahead with your update, trench man.
05 14 47 54 CC Roger. 087 dash 2 Alfa plus 266 minus C270 136 29 19 3483, 088 dash 1 Bravo plus 230 minus 0600 137 54 3591, 089 dash 1 Alfa plus 292 minus 0622 139 30 06 320, 090 1 Bravo plus 314 minus 0620 141 06 07 3386, 091 dash 1 Alfa plus
291 minus 0622 142 42 26 3541, 092 dash 1 Alfa plus 224 minus 0630 144 16 25 3073. Standing by for readback.

Okay. 087 dash 2 Alfa plus 266 minus 0270 136 29 19 3483, 088 dash 1 Bravo plus 200 minus is that 20 or 230?

Plus 230.

Roger. Can't read my own writing. Plus 230 minus 0600 137 54 53 3591, 089 dash 1 Alfa plus 292 minus 0622 139 30 06 3430, 090 dash 1 Bravo plus 314 minus 0620 141 06 07 3386, 091 dash 1 Alfa plus 291 minus 0622 142 42 26 3541, 092 dash 1 Alfa plus 224 minus 0630 144 16 25 3073. Readback is correct.

Okay. Could you give me a map update and also a star chart update?

Roger. Stand by.

Apollo 7, Houston. I have the map and star chart updates.

Roger. Go ahead.

REV 85 nodal crossing 133 plus 39 plus 58, 33.0 west. For the map, right ascension is 414.

Roger. Understand. Say again the ... right ascension.

414.

Roger. I got you. Thank you.
Okay.

Apollo 7, Houston. Opposite omni, please.

Roger.

Apollo 7, Houston. One minute LOS Redstone; Canaries at 17.

Okay.

CANCHY (REV 86)

Apollo 7, Houston through Canary.

Roger.

Say, Donn, I have rather extensive explanation regarding this landmark tracking. I'd like to start passing it up. It's a lot of verbiage, but I don't know how else to do it.

Okay. Stand by.

Go ahead, Bill.

Right. I guess when I get through here, all the talk is going to result in about only two changes in the procedure. I would like to go through it so you get an idea of the thinking that has been going here.

Okay. Go ahead.

All right. First point: tomorrow, we will perform landmark tracking on the three revs scheduled in the flight plan, that is, on 90, 91, and 92. And second point: on yesterday's or today's - it depends on how you look at it - landmark tracking,
the following problem resulted in AUTO optics not acquiring on all three landmarks; or to say another way, this is the reason AUTO optics didn't work. The trunnion will not drive until the computed trunnion is less than 38 degrees. The shaft is driving at this time which gives the impression that it is acquiring. And apparently, you started out with zero optics, and with zero optics when the less than 38-degree trunnion occurs, the optics have then approximately 38 degrees to drive in trunnion to acquire the landmark. Now, this 38 degrees plus a possible overshoot results in the thing hunting ground and the AUTO optics not acquiring.

Okay. Bill, I know all that. What happened yesterday is that it never came out of zeros that I could tell. Even when the target got within the 38 degrees, it did not appear to drive. Also, on one of the landmarks, it was beyond the 38-degree limit the whole time. It was way off to one side.

Roger. Okay. I was afraid of that.

You see, I don't know all about how it is supposed to work. It didn't because the one landmark - in fact, on two of them, it was beyond the field of view.
On two of them, it was beyond the field of view?

I know what happened. It never moved off center even when it got within 38 degrees. Right now, it is supposed to drive out and pick it up when you get within 38 degrees of it.

Okay. I got the picture. Two of the landmarks given to you were actually beyond the limits. And one of them, even after you got it within the 38 degrees, never went off the stops in trunnion.

Well, that's what it appeared to me; yes.

Okay. Thank you. Sorry; I didn't mean to be labor that point.

No, that's okay. I understand what you mean. My point about it not working: it doesn't do you any good. I guess that is the point.

Okay. If it doesn't work, this procedure I was getting ready to go through is not going to be any good either. But let me stand by and take another look at this before I occupy your time.

That's okay. Go ahead and read it up first.

Okay. They - the net point was the first landmark may have been too far out of plane. Apparently, that's correct from what you said. On the second landmark, you may not have waited until the less than the 38-degree constraint was met before starting. Apparently, this is the time it wouldn't come off zero.
Now, wait a minute. That's not true. I waited until Walt said he saw the thing out the window, and then I went for it manually. By that time, it was almost up to the center of the ... or well within the 38 degrees, and I did attempt to get on it and track it, but it was so close to center by then the optics couldn't keep up on it.

Okay.

It never did drive out there automatically to pick it up?

Roger. That's the point.

... zero and the shaft rolled around.

Okay. Well, that's the point you were just making then. Okay. On the - on the third landmark, you keyed in a plus sign on the latitude. I don't know what that means, other than maybe there was a wrong algebraic sign.

Okay. That was my goof. That was also beyond the field of view, and AISO had to go over and work manually, and it was still --

Okay. That was another one that was beyond --

I was looking out the side window on that one, also.

Okay. Thank you.

What I thought was when they - apparently when these guys say in the south, they really mean
south, which means we've got to roll maybe 15 - 20 degrees even to see it, which is a little bit far because that puts it way out in a strange oblique angle.

Right. Okay. One more item. The following changes to procedures should result in successful AUTO optics. A is - I am sure you're already doing this, Donn, but I am going to go through it anyway. To provide earlier acquisition time, revise step 5 in the procedure, which I doubt you are even using, to get the spacecraft equal to 10 degrees versus 23 degrees. And I think from what you said down at the Cape, you were using 10 degrees.

That's what we have been using all along; yes.

I didn't change the checklist, and that is my goof. Okay. And also - I guess the point that is a little bit different here - I hadn't - I didn't know about it. When you call up - before you call up P22 manually, let me get this. Call P22, execute procedure through onboard checklist except manually position shaft zero, trunnion 35 degrees prior to ENTER.

Stand by.

Apollo 7, Houston. We are coming up on LOS; we'll pick you up at - S-band volume up at Honeysuckle.
Okay.

REDSTONE (REV 86)

Apollo 7, Houston.

Apollo 7, Houston through Redstone.

Apollo 7, Houston through Redstone.

Roger. Houston, Apollo 7.

We'll try to carry on with this, finish up the little blurb I have here on landmark tracking.

Okay. Go ahead.

Okay. This involves a suggested change in the procedure. At step 6 in the checklist, which is the perform AUTO optics position code, code 11 - and it is a suggested change prior to the ENTER following that code 11 - the idea is that after this step 6, before you hit the ENTER button, manually position shaft zero, trunnion 35 degrees, trunnion 35 degrees.

Okay. They need to put it in CMC?

Yes, affirmative. That's correct, and then optics mode to CMC and then ENTER.

Okay. I think I see what you're driving at.

Right.

Do it that way.

Roger. It sets the trunnion to a better initial value to minimize the AUTO optics acquisition time.
05 16 22 58  CMP  Okay.
05 16 23 00  CC  Let's see. Couple more items here. If unable
to acquire target, then track unknown landmarks
such as coastlines, clouds, et cetera.
05 16 23 15  CMP  Roger. That's a good deal.
05 16 23 18  CC  After landmark tracking, we want to perform a
sextant star observation with approximately
35-degree line of sight to the sun. The scan-
ing telescope test data correlates well with
what was predicted, and we are satisfied with
that data. After this test, the star count
test will be closed.
05 16 23 47  CMP  Roger. Say again. You want to do what now?
05 16 23 50  CC  After landmark tracking, we want to perform a
sextant star observation with approximately
35-degree line of sight to the sun.
05 16 24 03  CMP  Oh, I see what you mean. Okay.
05 16 24 07  CC  We will update that in the flight plan. By the
way, that flight plan update I'll start over
Antigua.
05 16 24 16  CMP  Roger.
05 16 24 17  CC  One final item. We are considering star lunar
horizon sightings for later in the flight.
05 16 24 25  CMP  Roger. You better make it pretty soon. That
sun is going lower each day. It's receding
toward the east, and there isn't much left now -
much space between it and the sun, I mean.
Roger. Okay.

I was thinking perhaps - Bill, are you still there?

Roger. Go.

After the last landmark pass, on that night pass, following that, if we perhaps could do the sextant check then sextant - I mean, the lunar landmark set check.

We'll take a look at that. Sounds like a good idea.

Bill, I've been watching it come up, and it's in a good position. I can use any one of about three stars, plus I think I can either get a landmark or the lunar - or the limb of the moon, either one. But it's receding toward the east, and if we wait another day or two, I'm afraid we're not going to have any nighttime left with the moon up.

Well, that's a good point. Were those three stars you mentioned, were those Apollo stars?

Yes. There's Alpharetz and Procyon, and there's one other one - I'll have to look - Regulus, except it's a little too close.

Okay. Thank you.

Oh, Denebola.

Donn, would you turn the O2 tank 2 fans on for about 3 minutes?
Roger. I've got a comment relative to that star count. I hope the daylight star people are not reading too much into these results we're getting. The fact is unless you can see 40 or 50 stars out there, you can't see enough to really say what part of the sky you're looking at.

Okay. I've got it written down.

I guess the point is they are hard to identify. Even though you can see goodly numbers sometimes, you don't know what they are.

Right.

Apollo 7, Houston. One minute LOS Redstone. You can turn those fans back off, and we'll have Antigua at 39.

Roger.

Antigua (REV 87)

Apollo 7, Houston.

Apollo 7, Houston through Antigua. I have a flight plan update when you get ready to copy.

Stand by a minute.

Okay. Stand by.

Go ahead, Bill.
Roger. We'll be starting on page 2 dash 48 at about 140 hours - and over there in the box where it says GO/NO-GO 106 dash 1 - the next item is state vector, and - let's see, we'll be passing that up at 142 43.

Roger. That's your time tag?

That's the time tag, excuse me. That's correct.

And delete the reference to the W-matrix. And for the landmarks, we will have a T align of 1h1 plus 14.

Roger. Understand. T align of 1h1 plus 1h.

Affirmative. And at that time, you'll also get landmark ID updates.

Okay.

On next page at 140 hours, all "Set up TV."

Say again time.

140 hours.

Roger. Set up TV.

At 1h1 plus 12, add "TV ON." This is 2 minutes before Texas acquisition.

Roger. TV on at 1h1 plus 2.

Affirmative. At 1h1 plus 30 add, "Fuel cell O₂ purge."

Okay. Fuel cell purge at 30 for oxygen.
Affirmative. At 142 plus 35, replace the nine-by-nine with a three-by-three. On the P22 orbital NAV, there is a parenthetical insertion there, "nine-by-nine". Make that "three-by-three."

I don't understand. We don't do that on board, do we?

Negative.

I'll skip that.


What that means is they'll give you a state vector update, and, if it doesn't interfere with the P52, ...

Okay. What time is this, 143 30?

143 plus 40.

Okay, Bill.

And we need opposite omni.

You still reading me, Apollo 7?

Roger. Go ahead.

Okay. I thought maybe we had lost you there.

At 145 plus 20, "State vector update, P52 permitting", and again that means if it doesn't interfere with P52.

Okay.
At 146 hours, replace that box over there, "Scanning telescope star count," and make that "Sextant star count."

Okay.

Now, at 146 plus 40, we put a P23 in there for midcourse, and that's the one you were just talking about, I think. We just added that.

Can you say that one again?

At 146 plus 35 or 40, somewhere right along in there.

What are you going to do there?

P23 midcourse.

Oh, okay.

We just stuck that in there in response to your remarks.

All right.

We're coming up on LOS; I'll pick you up in Canary.

Apollo 7, Houston through Canary. How do you read?

Loud and clear.

Very good. I'll continue on with this thing. At 147 hours in your flight plan, there is a telescope star count, and - with the sun line of sight and so forth. Just make that co-entry there a sextant star count, and that's it.
Okay.

CC

05 16 51 43

Okay. At 148 hours on the - on page 2 dash 51, 148 hours - G&N and also SCS power down.

CMP

05 16 51 58

Roger.

CC

05 16 51 59

Delete the entry down at 149 plus 30 hours where it says that G&N power down and SCS power down; just scratch through that.

CMP

05 16 52 13

Roger.

CC

05 16 52 15

And right above, at 149 plus 10, delete "F23 star horizon sightings."

CMP

05 16 52 27

Roger. Delete horizon sightings.

CC

05 16 52 31

Over on the next column, at 150 plus 05, H2 heaters ON. And at -

CMP

05 16 52 52

Okay.

CC

05 16 52 53

- at 150 plus 25, "Fuel cell H2 purge."

CMP

05 16 53 07

Got it.

CC

05 16 53 11

Okay. That's the end of the update. Have a relative listing of priorities which are probably well familiar to you, but I'll pass them on up anyway. In order of priority, most important first, the P22, a minimum of two successful revs and three landmarks each rev. The P52's, two of them during the night pass between the P22's; and then third and lowest priority, the sextant star count.

CMP

05 16 53 45

Roger. Got it.
Okay. That is the end of the update.

Apollo 7, Houston. Coming up LOS Canary; we'll have Carnarvon at 27.

CARNARVON (REV 87)

Apollo 7, Houston through Carnarvon.

Roger, Houston.

Apollo 7, Houston. LOS Carnarvon about 1 minute. You can turn your S-band volume up in about 3 minutes for Honeysuckle.

Roger, Bill.

HONEYSUCKLE (REV 87)

Apollo 7, Houston through Honeysuckle.

Roger, Houston, Apollo 7.

Houston, Apollo 7. Go.

Roger. I was just announcing acquisition Honeysuckle.

Roger. Coming in fine this time.

Good. I'm reading you five-by, too.

I just took some neat pictures over Australia. At least, I hope they turn out neat.

Good. Do you have the frame numbers or anything?

Yes. Stand by. I'll get it squared away and bring it up for you.

Okay. How are you feeling today?

Oh. pretty good.
CC 05 17 37 18 Did you sleep pretty solid last night?
CC 05 17 37 22 CMP Yes; sure did.
CC 05 17 37 24 Did you sleep pretty solid last night?
CC 05 17 37 37 CMP Okay. These are frames 116 through 123.
CC 05 17 37 43 CMP Okay. These are frames 116 through 123.
CC 05 17 37 46 CMP Roger. And the time was 137 hours 30 minutes
through about 34 minutes.
CC 05 17 37 54 CMP Roger. 137 plus 30 through 137 plus 40.
CC 05 17 38 00 CMP Negative. Thirty-four.
CC 05 17 38 02 CMP Thirty-four; I understand.
CC 05 17 38 03 CMP About a 4-minute period there.
CC 05 17 38 05 CMP Roger. Understand. Four-minute period. How's
the camera working?
CC 05 17 38 17 CMP It's holding up real well.
CC 05 17 38 19 CMP Thought I heard Walt say something the other
day about it not working right, or you were
having some trouble with it.
CC 05 17 38 25 CMP Well, we were, earlier in the flight. Seemed
to be gummed up.
CC 05 17 38 29 CMP Good.
CC 05 17 38 31 CMP But Wally took some - there was some old grease
in there, real gummy stuff - he got that out of
there. We put in a little light oil that we had
in our medical kit, that nose cream.
CC 05 17 38 42 CMP Roger.
05 17 38 44 COMP It's been working pretty well ever since.
05 17 39 26 COMP Bill, log me another 20 clicks of water, please.
05 17 39 31 CC Roger. Twenty clicks. Also, Donn, have a
question regarding the - when you make a water
dump, how - you know you reported that it
affected the optics for a period of time, and
a question: how long does it affect your
ability to see through the optics when you make
a dump?

05 17 40 03 COMP Roger. Well, what happens is that anytime that
you dump fluids ... they turn to ice crystals,
and the sun reflects off of them, and it's
millions of them out there. Usually during a
water dump or urine dump - why, it will persist
for - oh, 3 or 4 minutes anyway; in fact, some-
times longer than that.

05 17 40 25 CC Roger.
05 17 40 26 COMP Also ... know once in a while when you're driv-
ing the optics in shaft, you see little flakes
of something come out on account of that. I
don't know what the source of that reflection is.

05 17 40 38 CC Okay. But from the time you first see this
stuff - these crystals - it takes 3 or 4 minutes
for them to disperse enough so that the optics
are usable again. Is that a correct assumption?
At least that long. It may be longer than that. Usually what happens is you're either in complete darkness or complete daylight within that 3- or 4-minute period; so I really couldn't say if you were in deep space how long it would take for those to disperse.

Okay.

I think the message is — say, on the translunar operation, you would not want to be dumping water anytime soon before your optics operations.

Okay. I've got that copied down. Also, while I'm bugging you, I've got a question here from the medic. He wants to know if you coughed about 2 minutes ago.

(Laughter) Matter of fact, I did. I was drinking a drink of water, and there was some — gas came out of the water gum.

Okay. And did you turn your head?

(Laughter) No, I did not.

Apollo 7, Houston through Redstone.

Roger, Houston.

Apollo 7, Houston. One minute LOC Redstone; MILA at 12.

Roger. Twelve for MILA.
<table>
<thead>
<tr>
<th>Time</th>
<th>Receiver</th>
<th>Message</th>
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</thead>
<tbody>
<tr>
<td>05 18 12 46</td>
<td>CC</td>
<td>Apollo 7, Houston through MILA.</td>
</tr>
<tr>
<td>05 18 12 54</td>
<td>CMP</td>
<td>Roger. Houston, Apollo 7.</td>
</tr>
<tr>
<td>05 18 12 57</td>
<td>CC</td>
<td>Roger, Apollo 7. Request batt C voltage, please.</td>
</tr>
<tr>
<td>05 18 13 18</td>
<td>CMP</td>
<td>36.0 amps.</td>
</tr>
<tr>
<td>05 18 13 21</td>
<td>CC</td>
<td>Would you say again, Donn?</td>
</tr>
<tr>
<td>05 18 13 23</td>
<td>CMP</td>
<td>36.0.</td>
</tr>
<tr>
<td>05 18 13 26</td>
<td>CC</td>
<td>Roger. 36.0. Thank you.</td>
</tr>
<tr>
<td>05 18 13 28</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
</tbody>
</table>

**ANTIGUA (REV 88)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Receiver</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 18 20 42</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS Antigua; Canaries at 25.</td>
</tr>
</tbody>
</table>

**CANARY (REV 88)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Receiver</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 18 25 33</td>
<td>CC</td>
<td>Apollo 7, Houston through Canary.</td>
</tr>
<tr>
<td>05 18 31 19</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS Canary. We have about 1 more minute that we can use usually on the - through Madrid. I want to give you a call in about a minute and a half just to see if it's working.</td>
</tr>
<tr>
<td>05 18 31 36</td>
<td>CMP</td>
<td>Okay. Good.</td>
</tr>
<tr>
<td>05 18 31 40</td>
<td>CC</td>
<td>And you will need your S-band volume up.</td>
</tr>
<tr>
<td>05 18 31 47</td>
<td>CMP</td>
<td>Roger. S-band's up.</td>
</tr>
<tr>
<td>Time</td>
<td>Code</td>
<td>Text</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>05183218</td>
<td>CC</td>
<td>Apollo 7, Houston transmitting through Madrid.</td>
</tr>
<tr>
<td>05183302</td>
<td>CT</td>
<td>Madrid is air-to-ground.</td>
</tr>
<tr>
<td>05183309</td>
<td>CC</td>
<td>Apollo 7, Houston. How do you read?</td>
</tr>
<tr>
<td>05190043</td>
<td>CCM</td>
<td>Apollo 7, Houston through Carnarvon.</td>
</tr>
<tr>
<td>05190047</td>
<td>CMP</td>
<td>Roger. Houston, Apollo 7. Go.</td>
</tr>
<tr>
<td>05190051</td>
<td>CC</td>
<td>Roger. Acquisition Carnarvon.</td>
</tr>
<tr>
<td>05190059</td>
<td>CMP</td>
<td>Bill, I think I'm going to power up a little</td>
</tr>
<tr>
<td></td>
<td></td>
<td>early and try to get PS1 done on this night</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pass.</td>
</tr>
<tr>
<td>05190105</td>
<td>CC</td>
<td>Okay. You're going ahead - you'll do it in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>about 10 minutes?</td>
</tr>
<tr>
<td>05190115</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>05190116</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>05190118</td>
<td>CMP</td>
<td>Calls for it at 30 minutes after the hour.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Think I'll go ahead and do it now.</td>
</tr>
<tr>
<td>05190123</td>
<td>CC</td>
<td>Okay. I'm changing my flight plan accordingly.</td>
</tr>
<tr>
<td>05190129</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>05190714</td>
<td>CC</td>
<td>Apollo 7, Houston. Coming up on LOS Carnarvon;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>S-band volume up for Honeysuckle.</td>
</tr>
<tr>
<td>05190722</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>05191221</td>
<td>CC</td>
<td>Apollo 7, Houston. Go.</td>
</tr>
<tr>
<td>05191231</td>
<td>CMP</td>
<td>All right. Houston, Apollo 7. Go.</td>
</tr>
<tr>
<td>05191234</td>
<td>CC</td>
<td>I'm sorry, Donn; I thought you called me.</td>
</tr>
<tr>
<td>Time</td>
<td>Station</td>
<td>Comment</td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>---------</td>
</tr>
<tr>
<td>05 19 12 37</td>
<td>CMP</td>
<td>No. I'll give you an S-band here.</td>
</tr>
<tr>
<td>05 19 12 40</td>
<td>CC</td>
<td>Yes.</td>
</tr>
<tr>
<td>05 19 15 08</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS Honeysuckle; Texas at 41.</td>
</tr>
<tr>
<td>05 19 15 15</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 19 15 29</td>
<td>CC</td>
<td>Apollo 7, Houston. We'll have a NNAV vector for you at Texas.</td>
</tr>
<tr>
<td>05 19 15 34</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 19 41 20</td>
<td>CC</td>
<td>Apollo 7, Houston through Texas.</td>
</tr>
<tr>
<td>05 19 41 25</td>
<td>CMP</td>
<td>Roger. Houston, Apollo 7.</td>
</tr>
<tr>
<td>05 19 41 28</td>
<td>CC</td>
<td>Doan, I've got quite a bit of coolie work for you to do here: have a landmark update, a P27 manual PAD, and a NNAV vector to pass up when you're ready.</td>
</tr>
<tr>
<td>05 19 41 42</td>
<td>CMP</td>
<td>Okay. Stand by.</td>
</tr>
<tr>
<td>05 19 41 48</td>
<td>CC</td>
<td>Right.</td>
</tr>
<tr>
<td>05 19 43 15</td>
<td>CMP</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>05 19 43 21</td>
<td>CC</td>
<td>Apollo 7, Houston. Let me know when you're ready to copy.</td>
</tr>
<tr>
<td>05 19 43 25</td>
<td>CMP</td>
<td>Okay. I'm ready. Which one you want first?</td>
</tr>
<tr>
<td>05 19 43 29</td>
<td>CC</td>
<td>Do you want to take the landmark first?</td>
</tr>
<tr>
<td>05 19 43 33</td>
<td>CMP</td>
<td>Okay. Just a minute.</td>
</tr>
<tr>
<td>05 19 43 36</td>
<td>CC</td>
<td>Well, if you have the other one, I'll go with it; I just didn't know which one you got.</td>
</tr>
<tr>
<td>05 19 43 51</td>
<td>CMP</td>
<td>Okay. I'll take the landmark.</td>
</tr>
</tbody>
</table>
light. The T align you already have, 141 plus 14. Okay. I'll give you the three landmarks.

First ID is 8 slash south, GET is 142 plus 47, shaft 140, trunnion 300. Second ID is 37 slash north, GET of landmark 142 plus 54, shaft 490, trunnion 3 - I'll have to give you the trunnion on the second landmark in just a minute. I'm going on to the third landmark; ID is 209 slash south, GET 143 plus 09, shaft 100, trunnion 310.

Roger. I don't understand the shaft angle. Is that in tenths of degrees or what?

It must be; let me check.

Okay.

Donn, could we have ACCEPT, please? And we'll go ahead and send up that NAV vector.

Roger. Got it.

Roger. Donn, you don't need those shaft and trunnion angles. I shouldn't have sent those up.

That's okay. I like to have them.

But you're right; it's to one decimal place.

And the trunnion on the second landmark was 36.0.

Roger.

TEXAS through ANTIGUA (REV 89)

Okay. I have a P27 update when you are ready to copy.
Roger. Go ahead.

Roger. This will be for GSM NAV vector.
VERB 71, 142 plus 43 plus 00, index 21, 01605
00001 76332 41236 14021 22711 04330 14421 51621
42274 71220 62676 11564 11455 06077 33520. I
have a NAV check. NAV check, 142 13 0000 minus
3070 plus 11877 1438. Standing by for readback.

Roger. GSM VERB 71 142 43 00, index 21 01605
four balls 1 76 332 41236 14021 22711 04330 14421
51621 42274 71220 62676 11564 11455 06077 33520.
NAV check 142 13 00 00 minus 3070 plus 11877 1438.

Readback is correct, and the computer is yours.

This NAV check goes with this state vector, right?

Right. That's in case you need to fall back on it.

Okay. Good point.

Bill, --

Yes.

I don't understand this shaft angle up in sec-
second star. If the target's to the north, how
can I have a shaft angle of 19 degrees?

Stand by. I'll check on it.

Apollo 7, Houston.

Roger.

Hey, Donn, you're right. That should be 31 degrees. In other words, that was a minus
19 there.
Oh, I get it.

Bill, I gather these shaft and trunnion angles mean that with the zero roll angle, that's where the target will appear in the field of view.

That is my impression, and I'll get that straightened out, too.

Roger.

Yes, I've been told that's correct.

Okay. Fine.

Apollo 7, Houston -- I got a little roll right on that second one. Maybe we ought to pull it in a little closer.

I'm sorry, Donn; I cut you out. Say again, please.

Roger. Disregard.

Right. Apollo 7, Houston. You have GO for 106 dash 1.

Roger. Understand. GO for 106-1.

Roger.

VANGUARD (REV 89)

Apollo 7, Houston. Coming up on LOS; Canary at 59.

Roger. Understand.

CANARY (REV 89)

Apollo 7, Houston through Canary.
05 19 59 37  CMP  Roger.
05 20 02 18  CC  Apollo 7, Houston. You're still in ACCEPT; you can go to BLOCK if you wish.
05 20 02 24  CMP  Roger. BLOCK.
05 20 02 26  CC  All right. Thank you.
05 20 03 24  CMP  Houston, Apollo 7. Over.
05 20 03 26  CC  Apollo 7, Houston. Go.
05 20 03 28  CMP  Roger. Could you give me the rationale now for the sextant star count later on today? I don't understand why we're doing that.
05 20 03 39  CC  Would you say again, please?
05 20 03 41  CMP  The sextant star count scheduled at about 127 hours: I just wondered why we were doing it since we have already done the star count.
05 20 03 51  CC  Stand by one.
05 20 03 55  CC  Apollo 7, Houston. We'll get back with you on that one.
05 20 04 00  CMP  Okay. Sextant in the daytime.
05 20 04 09  CC  Apollo 7, Houston. Opposite omni.
05 20 04 11  CMP  Okay.
05 20 05 27  CC  Apollo 7, Houston. We're still not reading you. Would you select another omni for maximum strength, please?
05 20 05 34  CMP  Roger. This is channel 4.
05 20 05 37  CC  Right.
05 20 05 49  CC  Apollo 7, Houston. Coming up LOS Canary; Carnarvon at 33.
Roger.

CARNARVON (REV 89)

Apollo 7, Houston through Carnarvon.

Roger, Houston.

Donn, we'd like to get an open circuit battery check. It'll require pulling a circuit breaker here.

Okay. Go ahead. What do you want?

Okay. First, we'd like to put the DC indicator switch to either MAIN A or MAIN B.

Okay. It's on MAIN A.

Okay. And then on panel 5, we'd like to open the following circuit breaker: the batt relay bus batt A circuit breaker.

Stand by.

Roger. Batt relay bus batt A going open now.

Okay. And we're going to leave it open here to get some time data. We'll close it just before LOS Honeysuckle.

Okay.

What we'll do is we'll repeat the following procedure for battery B over the States.

Okay.

And, Donn, on the question you had on the sextant star count: what we had done before was the scanning telescope star count. This is little different; we get a 37-degree LOS with the sun.
05 20 35 55  CMP  Roger. I understand. I thought the sextant count was to be used in case the telescope count didn't pan out, and since we did get – we did succeed in getting star counts on two lines of sight there, I don't understand why we have to do it again. I've already verified that you can see stars in the sextant in the daytime.

05 20 36 18  CC  Okay. Stand by.

05 20 36 38  CC  Donn, it's the line of sight that they feel that's important. We haven't done anything quite that close to the sun before.

05 20 36 54  CMP  Roger. We'll discuss it and call you back later.

That's eating into my sleep time for one thing, so I guess Walt can do it then.

05 20 37 00  CC  Okay. This is the last test we're going to do on that, Donn.

05 20 37 05  CMP  Okay.

05 20 38 01  CC  And, Donn, could you place your O₂ tank 2 fans on for 3 minutes then OFF?

05 20 38 09  CMP  Roger. Two going ON.

05 20 39 51  LMP  Houston, Apollo 7. Over.

05 20 39 53  CC  Good morning, Walt.

05 20 39 58  LMP  Roger. Morning reports seem to indicate that we're not leaking any more out in this cabin.

Partial pressure O₂ is still 245 mm.

05 20 40 09  CC  Roger. Copied that.
Apollo 7, Houston. We got about 1 minute LOS Carnarvon. You want to turn up your S-band volume for Honeysuckle.

Roger.

**Honeysuckle (REV 89)**

Apollo 7, Houston. You can close batt relay bus batt A circuit breaker now.

Good morning, Jack.

Good morning, Wally. How are you this morning?

Pretty good. Did we just go over Penny's home town?

Kind of looks that way.

Yes, it was up loud and clear; sitting there it was very pretty.

Roger. Did you copy the closure of batt relay batt bus A circuit breaker?

Yes, Walt's doing it now.

Okay. Real fine.

We could see Sydney, Melbourne, Canberra; they really stood out clear as a bell in COAS over here.

Roger.

At dark.

We can even see the Southern Cross at this time, so Penny can feel pretty good about the flag up in her office.
Roger.

Jack, do you have a map update handy?

They are in work.

Okay. Walt, here is your map update.

Standing by.

Okay. For REV 89, a GMT of the node is 141 03 55, longitude 146.7 degrees west. We are pretty close to LOS Honeysuckle; pick you up at the Huntsville at -

HUNTSVILLE (REV 89)

Apollo 7, Houston through the Huntsville.

GUAYMAS through BERMUDA (REV 89)

Apollo 7, Houston through Guaymas.

Roger. Loud and clear, Jack.

You're loud and clear. Could I verify that the O2 tank 2 fans are OFF now?

We'll check it.

Give us a call, Jack, when you pick up the picture, will you?

Will do, Walt; and what we would like to do is get an open circuit check on battery B now, and while we're going across the States now here, could we put the DC indicator switch at MAIN A or MAIN B and then pull the batt relay bus batt B circuit breaker?

I pulled the circuit breaker in battery bus B batt relay bus.
05 21 13 17  CC  Okay. Fine, Walt. We'll give it about 10 minutes, and I'll ask you to close it.

05 21 13 22  LMP  Okay.

05 21 14 19  CC  We've got the picture now, Walt.

05 21 14 23  CDR  Roger. Good morning. We are with you today while passing over the States to give you our daily ritual.

05 21 14 35  CDR  Walt, would you please go over and dolly up the camera? I wonder what time it is.

05 21 14 50  LMP  I'll call up the computer clock time and take a look.

05 21 14 56  CC  Okay. The picture isn't the best right at this time, Wally.

05 21 15 00  CDR  This is where we stand, and you'll note it's just about the time or below time - I'm not sure which way you look at it - but we have our situation completely solved. We now know what our orientation is. Now, if you'll pass me the camera, I'll continue the tour of the cockpit for the good people.

05 21 15 25  CC  Apollo 7, Houston. Opposite omni.

05 21 15 33  CDR  We are showing the camera now in ALC OUT. That is a new picture of the camera crew today. They're looking into the commander's seat over to the number 1 window. And you see the sun just starting to come into the window, and it
gives out a bright glare, and you may notice there is some of the collection of deposit on the window as I zoom slowly. This window has given us some trouble in that it is near our dump system, and it caught quite a bit of debris on it. Next to the window is the optical site that we use for accurate alignment through the window. We come over to the number 2 window with the markings on it. These markings are used to orient the spacecraft if we have no other guidance system available, and it gives us the pitch angle in relation to the visible horizon of the earth. And it has numbers such as 05, 10, 15, 20, 25, 30, and a line at the top which is our retro attitude, the attitude we're in to decelerate the spacecraft out of earth orbit. Coming over to the center, or the hatch window, we have some lines that were added to it to give us attitude reference for reentry. The lines describe a 55-degree bank to the left, a 55-degree bank to the right, and two 90-degree banks either left or right.

Apollo 7, Houston. That's a good picture of the hatch window. We can clearly see the lines.

Apollo 7, Houston.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 21 18 33</td>
<td>CDR</td>
<td>Okay. Walt, why don't you take the camera back, and you can show us the overhead section above the couches.</td>
</tr>
<tr>
<td>05 21 18 39</td>
<td>CC</td>
<td>Okay. Wally, we've got your voice back now.</td>
</tr>
<tr>
<td>05 21 18 43</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>05 21 18 44</td>
<td>LMP</td>
<td>How's the picture, Jack?</td>
</tr>
<tr>
<td>05 21 18 45</td>
<td>CC</td>
<td>The picture is very good, very good.</td>
</tr>
<tr>
<td>05 21 18 47</td>
<td>CDR</td>
<td>What I had shown you there were the two windows, the commander's reference window for pitch attitude and the center hatch window for bank attitude for reentry if we lose other guidance systems.</td>
</tr>
<tr>
<td>05 21 18 59</td>
<td>CC</td>
<td>Roger. We copy the center window.</td>
</tr>
<tr>
<td>05 21 19 22</td>
<td>LMP</td>
<td>For the LMP, this is where he sleeps. It's also where the command module pilot sleeps during his sleep cycle. Under the couch, we can see that there is absolutely no space left available. We have a suit stowage bag which is now stuffed completely full with three suits. These suits came off about 6 hours into the flight, and we've been very comfortable ever since. Passing back to the commander, he will describe the other couch for us.</td>
</tr>
</tbody>
</table>

**GUAYMAS through BERMUDA (REV 90)**

<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 21 20 01</td>
<td>CDR</td>
<td>This area here is the area under the command pilot couch, and we're showing the stowage of</td>
</tr>
</tbody>
</table>
some of our loose equipment. The large long bag is the temporary stowage bag. At the far end is the helmets bag where we have our helmets stowed for the duration of the flight till we don our suits at the end. And at this point, Donn is frisking a sleep station bag. It looks like a normal camper's sleeping bag as it comes toward the lens.

That is affixed to the overhead structure that you see now ---

Apollo 7, opposite omni.

--- is a spring system to secure it.

When this is properly secured, we have the sleeping bags restrained, and we, in essence, are not in contact with any area of the spacecraft but the bag itself.

Donn Bisele's had a rather hard day, so we'll let him turn in early and give you an idea of what the sleep station looks like with one of the crew in it.

One of the things to get used to up here was sleeping in a position when you are completely free floating.

At this particular point, you can see some of the sunlight coming in. We find that when we get as tired as we are at the end of the day
here, we will cover our heads with the sleeping bag material, and the sunlight does not affect us.

05 21 22 00  CDR  Houston, are you still reading?
05 21 22 02  CC  Roger. Five-by, Wally.
05 21 22 08  LMP  At the far end of the stowage above the couches here, we have the helmet bags stowed for the commander on his side, and the lunar module pilot on his side, in the temporary stowage bag. You are looking here at two of the six umbilical hoses running from the environmental control system to the suits when the suits are on and to provide circulation when the suits are off. The hose on your right is the cold air hose bringing cold air into the suit, and the one with the screen - on your left - is the return hose from the suit. It is used also to clean the air with that screen when it's off the suit.

05 21 23 09  CC  Roger. Walt, we've lost the picture now.
05 21 23 14  LMP  Roger.
05 21 23 16  CC  You want to try opposite omni?
05 21 23 18  LMP  Okay. No more picture?
05 21 23 24  CC  It's coming back.
05 21 23 25  LMP  Okay. We have the Hasselblad camera being held by Wally Schirra now. Whoops, he let go of it. Did you see that, Jack?
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 21 23 40</td>
<td>CC</td>
<td>Roger. We copied that.</td>
</tr>
<tr>
<td>05 21 23 51</td>
<td>CC</td>
<td>A real good demonstration of zero g.</td>
</tr>
<tr>
<td>05 21 23 58</td>
<td>LMP</td>
<td>And we might add for everybody's benefit, coming up later on in these flights, that there should be absolutely no problems with getting around in zero g as long as you're out of those suits. The work done is almost zero, and you can move any place you want to very freely, and you certainly don't need strong handholds to take care of it. And you can generally jam your feet - you find you end up using your feet an awful lot more than you do in 1 g, kind of like a monkey moving around in his cage. He just took our picture. How's it going, Jack?</td>
</tr>
<tr>
<td>05 21 24 36</td>
<td>CC</td>
<td>It's going real fine. We're kind of locked up on a midframe here, but we're getting a good recording of this.</td>
</tr>
<tr>
<td>05 21 24 49</td>
<td>LMP</td>
<td>Okay. Here is a pencil demonstration. Notice how Wally can control that pen just with his breath. He could blow on me and probably do the same thing.</td>
</tr>
<tr>
<td>05 21 25 16</td>
<td>CC</td>
<td>Roger. Saw that, Wally.</td>
</tr>
<tr>
<td>05 21 25 20</td>
<td>LMP</td>
<td>Okay. We have the 16mm camera sitting back on the wall there just above my head.</td>
</tr>
<tr>
<td>05 21 25 32</td>
<td>CDR</td>
<td>This camera, too, has the wide-angle lens, and we'll have some color movies of some of our</td>
</tr>
</tbody>
</table>
Home activities, as we've already labeled them movies, naturally, our home movies.

05 21 25 49 CC We're just about to lose it now, Wally.

05 21 25 51 CDR Roger. And we do remember to remove the lens cap, as I just did.

05 21 25 54 CC Roger.

05 21 25 56 LMP And when we take pictures out the window, we always focus at infinity.

05 21 26 02 CC Roger. We've lost the picture now. Could we get you to close that batt relay bus batt B circuit breaker?

05 21 26 10 LMP Roger. It's in work.

05 21 26 13 LMP TV camera going off.

05 21 26 15 CC Wait, why don't you leave that circuit breaker open through Canary, and we'll close it at Canary.

05 21 26 19 LMP You want to see it go closed?

05 21 26 24 LMP Okay.

05 21 26 25 CC Leave the batt relay bus batt B circuit breaker open, and we'll close it just LOS Canary.

05 21 26 30 LMP Okay. TV camera going off.

05 21 26 32 CC Roger.

05 21 26 33 CDR Jack, you understand how our arrow works now?

05 21 26 38 CC Say again, Wally.

05 21 26 40 CDR You understand how our UP arrow works now? We're not sure ourselves.
05 21 26 50  CDR  Did that arrow on the aft bulkhead show up?
04 21 26 53  CC  No, we didn't see the arrow on the aft bulkhead.
05 21 26 56  CDR  Well, it blew the whole bit.
05 21 27 00  CC  We could see the lines on the hatch window very clearly, but not the lines on the rendezvous window.
05 21 27 08  CDR  I see; very good.
05 21 27 13  CDR  We -- Did you see the debris on my number 1 window?
05 21 27 17  CC  No, we couldn't make that out, and we lost your voice just about the time you were describing the -- just after you started the description of the hatch window lines.
05 21 27 28  CDR  I see.
05 21 28 15  CC  7, we are 1 minute LOS Bermuda; Canaries at 141 plus 33.
05 21 28 22  CDR  Roger.

            CANARY (REV 90)
05 21 33 43  CC  Apollo 7, Houston through the Canaries.
05 21 33 47  CDR  Roger. Loud and clear.
05 21 33 50  CC  Roger. I have some targets of opportunity that you can add to your synoptic training photography list.
05 21 34 04  CDR  Okay. Jack, you want to give it to me by time; is that what you're going to do?
05 21 34 09  CC  Stand by one, Wally; we've got a loud tone here.
05 21 34 16  CDR  Tell him he can take the day off.
05 21 34 24  CC  Apollo 7, Houston. Are you reading now?
05 21 34 28  CDR  We read you loud and clear.
05 21 34 29  CC  Okay. We had a loud tone there which cleared itself up. There are five targets of opportunity which you can add to your training photography.
05 21 34 41  CDR  Okay. How are you blocking those, by time?
05 21 34 45  CC  No. We're just giving you the targets, and then just letting you use your own judgement - fuel wise and everything - to photograph them when you come over.
05 21 34 57  CDR  Right. If you can give me a time back, I can put them on the flight plan; it's faster.
05 21 35 02  CC  Okay. Stand by.
05 21 35 16  CC  Wally, we may not get back to you with the GET of all five targets before Canaries then. We'll pick you up at Tananarive at -
05 21 35 24  CDR  - just give me the targets; we'll straighten it out later.
05 21 35 26  CC  Okay. We have Tananarive at 141 plus 52.
05 21 35 32  CDR  Okay.
05 21 35 45  CDR  Houston, Apollo 7.
05 21 35 47  CC  Go ahead, 7.
05 21 35 48  CDR  Roger. Give me the five targets, and we can go ahead and look them up ourselves.
Okay.

Okay. Wally, number 1 is the volcano in the Galapagos Islands.

Galapagos. Okay.

Number 2 is the Kilauea volcano in Hawaii.

And number 3 is the Taal volcano in Luzon, in the Philippine Islands.

Okay. I got that.

And number 4 is Mt. Areo in Costa Rica, and the lat is 9 degrees north, longitude 84 degrees west.

Standing by for nine north, 84 west. Roger.

And number 5 is Fort Bliss area in El Paso.

Roger. I think we got up to there yesterday.

Okay. And the number 3 - the Taal volcano in the Philippines - the lat is 14 degrees north, longitude 120 degrees east.

One hundred and twenty. Roger. Okay. We're going to do that area today and do landmarks and all of that good stuff, so we may have a chance to rack in a little.

Roger.

And, Wally, we've got a sixth one they just handed me: Africa, between 10 degrees north, 25 degrees east to 15 degrees north, 25 degrees east.
We've been hitting Africa pretty hard because that comes up, as you can see right now, in the daylight.

Okay. Fine. Could we get that batt relay bus batt B circuit breaker closed now?

Done.

Jack, what would help us is, if you can give us a lead in on this camera 15 to 20 minutes, we can pulse a little bit to stay near them.

Roger.

TANANARIVE (REV 90)

Apollo 7, Houston through Tananarive.

Apollo 7, Houston through Tananarive. Standing by.

Roger.

Apollo 7, Houston. One minute LOS Tananarive; Carnarvon at 142 plus 06.

Roger.

CARNARVON (REV 90)

Apollo 7, Houston through Carnarvon.

Roger. Standing by.

Roger.

How'd the show go over this morning?

Oh, the—we were locked on a midframe for about—oh, two-thirds of the way, or half the
way through, and we've got it on tape, and we are trying to replay it - to where it's not locked on a midframe.

05 22 10 57  CC  We lost voice just about the time Wally just started describing the middle hatch there, and to where you picked it up right after that.

05 22 11 12  CC  Wait, this landmark number 37: it's 78 miles north of ground track.

05 22 11 22  LMP  Okay.

05 22 11 25  CC  And could we get the BIOMED switch to CDR?

05 22 11 32  CDR  Done.

05 22 11 43  CC  Apollo 7. Opposite omni.

05 22 15 06  CC  Apollo 7, Houston. One minute LOS Carnarvon. We pick up Honeysuckle here; do you want to turn your S-band volume up?

05 22 15 15  LMP  Okay.

05 22 15 34  LMP  Jack, log the LMP 10 clicks of water on the water gun, will you, please?

05 22 15 37  CC  Roger. Will do. HONEYSUCKLE (REV 90)

05 22 20 48  CC  Apollo 7, Houston. LOS Honeysuckle; Hawaii at 142 plus 35.

05 22 20 55  CDR  Roger. Jack, we rode to the ... on that S-band. We're going to bring ...

HAWAII (REV 90)

05 22 36 06  CC  Apollo 7, Houston through Hawaii.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 22 36 09</td>
<td>CDR</td>
<td>Aloha.</td>
</tr>
<tr>
<td>05 22 36 12</td>
<td>CC</td>
<td>Roger. Wally, you're coming through loud and clear.</td>
</tr>
<tr>
<td>05 22 36 17</td>
<td>CDR</td>
<td>Good.</td>
</tr>
<tr>
<td>05 22 36 39</td>
<td>CMP</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>05 22 36 41</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>05 22 36 42</td>
<td>CMP</td>
<td>Log the CMP 20 clicks on the water gun.</td>
</tr>
<tr>
<td>05 22 36 45</td>
<td>CC</td>
<td>Will do. Hey, Donn, on this second landmark: this is going to be a fairly difficult one to acquire. You'll probably have to roll up about 30 degrees right to pick it up, and there's some cloud cover up there. We're saying near seven-tenths. If you do have any problems getting it, go ahead and acquire an unknown landmark and track that.</td>
</tr>
<tr>
<td>05 22 37 10</td>
<td>CMP</td>
<td>You say the second one; that's Tyndall Air Base, right?</td>
</tr>
<tr>
<td>05 22 37 13</td>
<td>CC</td>
<td>Yes, sir.</td>
</tr>
<tr>
<td>05 22 37 31</td>
<td>CMP</td>
<td>Hey, Jack, it's very likely we won't get it, and this would be a good checkout of the unknown landmark. Up to here, I've already done a couple of those.</td>
</tr>
<tr>
<td>05 22 37 39</td>
<td>CC</td>
<td>Okay. Understand.</td>
</tr>
</tbody>
</table>

**HUNTSVILLE through ANTIGUA (REV 90)**

<table>
<thead>
<tr>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>05 22 43 05</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>05 22 43 15</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
</tbody>
</table>
Apollo 7, Houston.

Loud and clear.

Roger. We have a small correction to the location of landmark 37, the second landmark.

Go ahead.

Okay. That's 78 miles south - south of ground track, which means you are going to have to roll that -

- what do you mean small -- That's 150 miles.

That's small - which means you are going to have to roll left, Donn, to get it.

I'm sorry about that.

That's no sweat.

Four marks in so far.

Apollo 7, Houston.

We've got five marks in that first landmark.

Okay. Real fine, real fine. We have a - when we changed that 78 miles from north to south, that is going to change our shaft that you should be reading. Your shaft for the second landmark will be 049 degrees, same trunnion.

Roger.

Roger.

Huntsville through Antigua (REV 91)

Here come the updates. Are you reading these, Jack?
05 22 50 18  CC  Affirmative, Donn. We are copying them.
05 22 50 21  CMP  Okay. I'll just go through them, then.
05 22 50 37  CDR  Earth state vector is good at all marks or better.
05 22 50 42  CMP  Or else it's not working.
05 22 50 43  CC  Roger. Copy that.
05 22 50 45  CDR  Roger.
05 22 51 09  CDR  Boy, you can really tell who is burning fires
down there today.
05 22 51 14  CC  Roger, Wally.
05 22 51 16  CDR  There is one place - there is a smoke curl of
about 160 miles; it just obscures the whole area.
05 22 51 23  CC  Copy that.
05 22 51 29  CDR  The pollution boys ought to get up here one time.
05 22 51 43  CMP  At 1 1/2 hours 51 minutes 34 seconds, Wally took a
picture of the city with the large smoke - large
smoke trail off of it. Magazine S, Frame ... zero.
05 22 51 53  CC  Copy.
05 22 51 56  CDR  Starting to roll left.
05 22 52 01  LMP  Here is a target location update.
05 22 52 15  CMP  What do you know, that point is under water.
05 22 52 41  CMP  Jack, what is that trunnion angle and shaft
angle for this target that I'm shooting?
05 22 52 50  CC  The trunnion is going to be 049, and the shaft
is going to be 03 - rather the shaft is going
to be 049, trunnion 030.
05 22 53 01  CMP  Okay. That's with the roll angle in?
05 22 53 09  CC  Negative. That is not with the roll angle in.
05 22 53 11  CMP  Okay. So we can subtract the roll angle a little there somewhat?
05 22 53 16  CC  Affirmative.
05 22 53 27  CMP  Magazine 8, pictures 127 to 130 were taken of Houston, and the area north of Dallas, and Dallas.
05 22 53 35  CC  Roger.
05 22 53 41  CDR  We are socked in right off the Gulf Coast.
05 22 53 55  CDR  There is a hole - we might see Tyndall, but it's pretty poor pickings.
05 22 53 59  CC  Roger.
05 22 54 15  CDR  Jack, whereabouts is Gladys this morning?
05 22 54 20  CC  Stand by. I'll get you lat/long.
05 22 54 28  CC  Wally, it looks like it's just generally west of Fort Meyers.
05 22 54 32  CDR  Yes. Walt has it right now. It's to the south of us.
05 22 54 38  CC  Roger.
05 22 54 47  CMP  Jack, next pass, if we don't have a landmark right around this same area, we can get a beautiful picture of that hurricane.
05 22 54 53  CC  Okay. Sounds good.
05 22 54 57  CDR  The weather is too bad to see Tyndall.
05 22 55 30  CMP  Hey, Jack.
05 22 55 32  CC  Go ahead.
05 22 55 37  CMP  Apollo 7, Houston. Apollo 7.
05 22 55 41  CC  Roger. Go ahead.
05 22 55 43  CMP  Roger. Jack, that isn't enough time between landmarks.
05 22 55 45  CC  Roger -
05 22 55 46  CMP  I have to get my book to the next landmark, and checklist squared away, and load in new data, plus accept all the results of the first one. You just can't get it all done in 7 minutes.
05 22 55 56  CC  Okay. I copy that, Donn.
05 22 55 58  CMP  I didn't get an unknown mark either because it was just too late getting on the scope.
05 22 56 04  CDR  We're trying to find out - and we - the best place to get practice landmarks is right here, JT.
05 22 56 11  CC  Understand.
05 22 56 12  CDR  OJT.
05 22 56 14  CC  Roger. Understand.
05 22 56 17  CDR  You understand we never did get landmark training with our simulator; it did not work.
05 22 56 20  CC  Roger. I knew that.
05 22 58 54  CDR  Houston, Apollo 7.
05 22 58 57  CC  Apollo 7, Houston. Go.
05 22 59 02  CDR  Roger. When I transmit the pulse to SELF COMMAND, it's much more difficult than it is in the simulator. I have to move the switch very rapidly to avoid a RATE COMMAND pulse.
05 22 59 12 CC   Roger. Copy that. And, Wally, -
05 22 59 15 CDR   That's the only anomaly I've seen in the system, other than the fact that the pulses are much smaller than they are in the simulator.
05 22 59 22 CC   Okay. Copy that. We do have the information on the first landmark for that next P22 during the next rev, if you're ready to copy.
05 22 59 39 CDR   I think he's using the book, Jack. You will have to hold.
05 22 59 41 CC   Okay.
05 22 59 45 CDR   Wait a minute; here he comes. Go ahead.
05 22 59 47 CC   Okay. This will be landmark 18. It's north of ground track, 28 miles north. The CET is 1 4/4 plus 23. You'll have a shaft of 343 and a trunnion of 31.
05 23 00 20 CMP   The 1 4/4 23 was the CET of landmark. Right?
05 23 00 24 CC   Affirmative.
05 23 00 25 CMP   How about landmark number, and give me the distance again?
05 23 00 28 CC   Okay. It's landmark 18, 28 miles north of ground track.
05 23 00 39 CMP   Landmark 18, 28 miles north, 1 4/4 plus 23, shaft rate 343, trunnion 31.
05 23 00 45 CC   Roger.
05 23 00 57 CC   We're trying to find a second one for you that gives you enough time in between sightings, and
if not, we'll give you - let you have an unknown landmark exercise.

05 23 01 08 CMP Okay.
05 23 01 42 CC And, Donn, on our second landmark for this next rev, we can't find a suitable landmark that is clear at this time.
05 23 01 53 CC So it's an unknown landmark exercise; it's your day.
05 23 01 58 LMP Okay. Fine. If there are too many clouds, I'll just use a cloud bank.
05 23 02 21 CC Real fine.

TANAMARIVE (REV 91)

05 23 27 16 CC Apollo 7, Houston through Tanamalie.
05 23 27 20 SC Roger. Loud and clear.
05 23 27 22 CC Roger. You're loud and clear also. How are the results of that third landmark, Donn?
05 23 27 28 CMP I got five marks on it and all the updates to the state vector Z coordinates, and it is now corrected at the landmark. I think it's rather significant for the computer to take ... 
05 23 28 04 CC Donn, you started out real good, and then you faded out; we'll catch you over Carnarvon on that report. We copied that the update to the state vector were all zips.

05 23 31 58 CC Apollo 7, Houston.
05 23 32 00 CT Roger.
05 23 32 04 CC Roger. We're about 1 minute LOS Tananarive. We'll have ARIA on S-band at 143 plus 38 and Carnarvon about 4 minutes later.

05 23 32 16 SC Roger.

ARIA 1 (REV 91)

05 23 37 44 CC ARIA 1, go REMOTE.

05 23 38 13 CC Apollo 7, Houston through ARIA.

05 23 38 16 CMP Roger. Loud and clear, Jack.

05 23 38 18 CJ Loud and clear, Donn.

05 23 38 32 CDR We have this band of data to be done.

05 23 38 39 CC Say again, Donn.

05 23 38 41 CDR This is Wally. What's the predicted path for Gladys?

05 23 38 46 CC Okay. Stand by. I'll have you a real good back on that as we come up through Carnarvon here.

05 23 42 53 CDR Okay.

CARNARVON (REV 91)

05 23 42 54 CC Apollo 7, Houston.

05 23 42 55 SC Loud and clear.

05 23 42 59 CC Roger. I have a couple of questions for Walt here.

05 23 43 04 LMP I'm listening.

05 23 43 06 CC Okay. The gurgling sound that we heard yesterday, Walt, when we were on AUTO 1 then: did you hear the same gurgling sound in AUTO 2?
<table>
<thead>
<tr>
<th>Time</th>
<th>Station</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 23 43 20</td>
<td>LMP</td>
<td>It's come back at several different times, and it's also gone away. It seems to be associated with higher humidity time. <strong>AUTO 1</strong> and <strong>AUTO 2</strong> are both working on the cyclic accumulators.</td>
</tr>
<tr>
<td>05 23 43 31</td>
<td>CC</td>
<td>Okay. Fine.</td>
</tr>
<tr>
<td>05 23 43 34</td>
<td>CDR</td>
<td>We have a theory, Jack, that where we provide gas on a burn, we start disturbing water that may be in the lines and get it started out of the pipes.</td>
</tr>
<tr>
<td>05 23 43 45</td>
<td>CC</td>
<td>Okay. Copy that. You are still stroking manually a little bit, too?</td>
</tr>
<tr>
<td>05 23 43 54</td>
<td>LMP</td>
<td>Yes, we hit it a couple of times. I'm not sure that had anything to do with clearing it up or anything. It seems to me it kind of runs its course, and it's occurred after burns every time.</td>
</tr>
<tr>
<td>05 23 44 03</td>
<td>CC</td>
<td>Okay. And then we had some garbled transmissions. We didn't get too much of the transmission when you reported a leak yesterday at the water panel. Did this occur when you were dumping waste water?</td>
</tr>
<tr>
<td>05 23 44 20</td>
<td>LMP</td>
<td>Every time we've dumped waste water, the place where the PUD attaches to the waste water panel is a – what do you call it – a swaged fitting, and there is no O-ring in it, and we tightened it up, and it leaked. I tightened it up again as much as I think we ought to on that small line with the wrench we have, and it still forms a big bubble every time you dump. You get a – oh, 4 or</td>
</tr>
</tbody>
</table>
5 ounces of water in the one big bubble right there on the waste water panel after you've finished dumping a waste water tank.

05 23 44 52 CC Okay. Copy that.
05 23 44 54 CDR Just to make the point clear, Jack, that same fitting is used as a GSE fitting on the spacecraft prep period at the Cape, and they used a voishant washer in there, but we can't do it that way. They're going to redesign that fitting for later flights or put a solid mount in.

05 23 45 14 CC Okay. Real fine. Real good description here. And the other thing is I have - we've got another landmark on this next pass that is - allows you to do some unknown landmark tracking in between. We'd like to pass you some data on a second landmark for this next pass.

05 23 45 34 LMP Okay. Go ahead.
05 23 45 39 CDR Jack, on this next pass, we'd like to make a run on that hurricane instead of an unknown. We can get unknowns all around the world.

05 23 45 45 CC Okay. We concur on that, Wally. We'd like for you to send up a state vector here at Carnarvon. Could you go to ACCEPT?

05 23 46 10 CDR You've got it.
05 23 46 11 CC Okay. Coming up.
05 23 46 14 CC Okay. This landmark is number 225. It's 68 miles south of ground track.
05 23 46 26  CDR  Hold it; hold it. Donn's doing another thing here.

05 23 46 31  CDR  All right. Start again, Jack. I'm sorry.

05 23 46 33  CC  Okay. Landmark 225, 68 miles south of ground track, GET 144 plus 56, shaft 037, trunnion 033.

05 23 47 02  CDR  Okay. Landmark 225, 68 miles south, 144 56 the time, 037 033 shaft and trunnion.

05 23 47 13  CC  Okay. This will be a real marginal landmark since it's quite close to the terminator there.

05 23 47 24  CDR  Okay.

05 23 47 26  CC  Okay. And I'm ready with your NAV check PAD when you're ready to copy.

05 23 47 31  CDR  All right. Stand by.

05 23 47 32  LMP  Go.

05 23 47 34  CC  Okay. GET 143 47 0000 minus 26 13 plus 11802 1502.

05 23 48 00  LMP  Roger. 143 47 four balls minus 26 13 plus 11802 1502.

05 22 48 09  CC  Roger. And we're through with the computer.

05 23 48 28  CC  And, Wally, would you like an update for the telescope for watching the hurricane, or do you intend to do that visually?

05 23 48 39  CDR  Visually.

05 23 48 40  CC  Okay. Copy.

05 23 48 55  CC  Okay. Wally, the present position of the hurricane is about 100 miles due west of Tampa.
05 23 49 07 CDR      Roger.
05 23 49 20 CC       I'll give you part of the news. The front page
                     headlines this morning on the mission says, "Big
Storm Tracked by Apollo 7" and describes the
spacecraft as a manned weather satellite.
05 23 49 34 CMP      The witch is out finally.
05 23 49 38 CC       We're about 1 minute LOS Carnarvon; we'll pick
                     you up at Hawaii at 144 plus 07.
05 23 49 51 CDR      One day we're COMSAT, and now we're NAV SAT.
05 23 49 54 CC       Roger.
05 23 50 00 CDR      Our Navy boys - they're just worried about being
                     UNSAT.
HAWAII (REV 91)

06 00 10 33 CC  Apollo 7, Houston through Hawaii.
06 00 10 36 CDR  Go ahead.
06 00 10 39 CC  Apollo 7, Houston. I have your block 16 data, whenever you are ready to copy.
06 00 11 02 CDR  Go ahead, Jack.
06 00 11 04 CC  Okay. 093 dash 4 Able plus 310 minus 1620 146 plus 58 plus 14 3420, 094 dash 4 Able plus 305 minus 1619 148 plus 34 plus 16 3452, 095 dash 4 Able plus 257 minus 1630 150 plus 09 plus 20 3350, 096 dash 3 Able plus 313 plus 1339 151 plus 25 plus 41 3430, 097 dash 3 Able plus 299 plus 1339 153 plus 01 plus 35 3455, 098 dash 3 Charlie plus 206 plus 1419 154 plus 38 plus 44 3101. End.

06 00 13 47 IMP  Roger. Readback follows: 093 dash 4 Able plus 310 minus 1620 146 plus 58 plus 14 3420, 094 dash 4 Able plus 305 minus 1619 148 plus 34 16 3452, 095 dash 4 Able plus 257 minus 1630 150 plus 09 plus 20 3350, 096 dash 3 Able plus 313 plus 1339 151 plus 25 plus 41 3430, 097 dash 3 Able plus 299 plus 1339 153 plus 01 plus 35 3455, 098 dash 3 Charlie plus 206 plus 1419 154 plus 38 plus 44 3101. Over.

06 00 14 49 CC  Roger. That is correct.
Hey, Jack, do you have much this pass because we're going to be pretty well tied up throwing cameras back and forth.

Okay. Nothing except the morning news which I can read whenever you are able to —

We'll wait.

Fine.

Apollo 7, Houston. Opposite omni. Could you tell us which one you will be on when you switch?

Able.

Roger. Understand. Able.

Roger. We're coming into the eye.

Say again, Wally.

We'll catch you near the eye of the hurricane.

Okay. Real fine.

It will be south of us. Man, that's really a spinner.

I copy.

It's really a very good definition here. It starts, and you can see the start of it right below us now. We're just going over the beginning of it. It's wide open to the west.
It's a very spectacular view. The - there are a lot of broken clouds around the edges of it, but it tightens up in the center. A real tight vortex and a spotty few high cu - thunderstorms about 100 miles outward - 150 miles off the center. There is a wide blue area, and then it tightens up in the center and reaches a peak just like the thunderstorms we described in South America.

Roger. Copy that.

Stand by for a mark. We are due south.

Stand by.

MARK.

Wally, was that the mark right over the eye? That's affirm. The eye is south of us about - oh, I'd say 200 miles, 150 miles.

Okay.

Jack, on that run, we ran the 16mm movie camera at 1 frame per second for a strip back from the west coast, LA through the hurricane. We ran the Panatomic film with red and green filters from the west coast through El Paso. We ran the S0121 from El Paso through the hurricane, including Houston. The chief landmark tracking on El Paso - I'll have Donn fill you on that.

Okay. Real fine, Wally.

Other than that, we are doing nothing.
06 00 30 49 CMP You should have seen it up here; it looked like squirrels in a cage.

06 00 30 52 CC Roger.

06 00 30 53 CMP Log this, Jack. Frame 1432 is where we completed taking pictures of the hurricane at this time.
I can't quite read - the MET here at 31, and just prior to that, we took three or four shots of the Houston area, which is wide open, the whole area down there.

06 00 31 17 CDR Clear Lake stood out like a bell.

06 00 31 21 CC Okay. Copy that.

06 00 31 23 CMP Magazine F.

06 00 31 25 CDR That's been one of our best passes today.

06 00 31 30 CMP It almost made us homesick.

06 00 31 33 CC Roger.

06 00 31 34 CDR We plan to drop in in a few days.

06 00 31 40 CC Roger. Understand.

06 00 31 43 CMP Jack, I ended doing an unknown landmark. The AUTO optics brought it in the sextant, but it was moving so fast, I got behind it, and never did get a mark on the runway. It was a pistol, though.
You really got to get on it in a hurry because it is whistling by, so I ended up taking a little spot out in the desert and did an unknown landmark instead.

06 00 32 07 CC Okay. Copy that, Donn.
Incidentally, the tracking pass itself, in general, is fairly simple to do if you get on it fast enough. The - I guess the hard part for me is in the procedural aspects of flipping switches and going through the program; meanwhile, the target is whistling by.

Apollo 7, Houston.
Go ahead.
Roger. We would like you to switch to the secondary tanks in quad Charlie; give us a mark when you do it.
You want the main OFF first or the secondary on first?
Secondary on first.
Roger. Stand by.
MARK.
Charlie ON.
Primary Charlie is coming off.
MARK.
Okay. We are about to lose you over Bermuda here; we will pick you up at Ascension at 144 plus 39.
Roger.
Apollo 7, Houston.
Go ahead.
Walt, did you put any high bit rate in the DSE this last rev?
06 00 36 27 LMP That's affirm.
06 00 36 28 CC Roger. Copy.
06 00 36 29 CDR We put it on when Donn was getting his state
vector updates in.
06 00 36 34 CC Okay.
06 00 36 38 CMP Would you like to hear when we have put on? It
probably screws up your dump schedule a little
bit, doesn't it?
06 00 36 47 CC I got a nod down here on that question.
06 00 36 50 CMP Okay. We will try and do that -
06 00 37 40 CC And, Walt, on the landmark tracking: about all
we need to get is low bit rate.
06 00 37 47 LMP Understand. All you need is low bit rate for
the landmark tracking.
06 00 37 51 CC Okay. And we're going to lose you here;
Ascension at 144 45.
06 00 45 30 CC Apollo 7, Houston through Ascension.
06 00 45 34 CDR Roger.
06 00 51 17 CC Apollo 7, Houston. We are 1 minute LOS Ascension;
Tanarive at 145 plus 01.
06 00 51 26 CDR Roger.
06 01 02 28 CC Apollo 7, Houston through Tanarive. Standing
by.
06 01 02 48 CMP Houston, Apollo 7.
Go ahead, 7.

We got a landmark on that last one and got five good marks on all ... updates and put the coordinates of land rate, the update coordinates on the tape. You should get it when it comes down.

Apollo 7, Houston. We are close to LOS Tanana-.. We'll have ARIA on S-band at 145 plus 12.

CARNARVON (REV 92)

Apollo 7, Houston through Carnarvon.

Roger. Houston.

Apollo 7, Houston. Opposite omni.

Say again, Jack.

Opposite omni, please.

Apollo 7, Houston. One minute LOS Carnarvon; we'll pick you up at Guam at 145 plus 28.

Roger.

GUAM (REV 92)

Apollo 7, Houston through Guam.

Stand by. ...

And, 7, we'll have a state vector update to send you over Hawaii.

...

Apollo 7, Houston.

Go ahead, Jack.

Okay. I have a PAD on this landmark tracking test that you're going to do here over pass beginning Hawaii.
Go ahead, partner.

Okay. The first landmark, 10; it's south of ground track 65 miles, GET 145 plus 56, shaft 043, trunnion 34. The weather's clear at this landmark. Second landmark, 142; 18 miles north of ground track, GET 146 plus 17, shaft 347, trunnion 31. Looks like it's about five-tenths covered.

Roger. We just got two this time, Jack?

Affirmative.

I see. I'll try to squeeze in an unknown one in the middle somewhere.

Okay. Good.

And, Walt, could we get you to switch the S-band AUX TV switch OFF?

That's a good idea.

We pick up Hawaii at 145 plus 41.

Roger.

The last of the news that I didn't finish this morning: the National Institute of Health announced today that they have a development of a vaccine to prevent German measles. Tommy Smith won a gold medal in the 200-meter dash with a world record time of 19.8. Bob Seagren picked up the United States' sixth gold medal by winning the pole vault, with a world record
of 17 feet 8 and 1/2 inches. George Foreman of Houston won a split decision in the opening round of the Olympic boxing.

Sounds like the home team is doing okay down there.

It sure is.

Jack, that hurricane is really a doozy. I haven't seen anything like that, ever.

It's moving north, Wally. It should hit the coast of Florida, around Tallahassee.

What are the highest winds on the outskirts?

HAWAII through ANTIGUA (REV 92)

Apollo 7, Houston through Hawaii.

Loud and clear.

Roger. We would like to send you a state vector update whenever you're ready.

Go, man.

Okay. Coming up, 7, and I'm ready to read you the NNAV check whenever you are ready to copy.

Go ahead, Jack.

Okay. GET 144 plus 50 plus 0000 minus 0936 minus 00891 1013.

Is your update in now?

Affirmative. The update is in. The computer is yours.

Here's your readback, Jack.
06 01 44 36  CC  Go ahead.
06 01 44 47  CDR  Houston, did you copy the readback?
06 01 44 49  CC  Negative. I didn't copy the readback.
06 01 44 51  CDR  It's on the DSKY.
06 01 44 54  CC  Roger.
06 01 44 59  CC  Copy the readback.
06 01 45 02  CDR  That's a pretty good readback, hey?
06 01 45 04  CC  Roger.
06 01 45 39  CC  Apollo 7, Houston. Opposite omni.
06 01 48 45  CC  Apollo 7, Houston.
06 01 55 37  CDR  Jack, frames 143 and 144 are of San Diego.
06 01 55 41  CC  Roger. Copy that.
06 01 55 44  CDR  Loud and clear. There you can see all the way
to North Island and Miramar, the whole scene.
06 01 55 59  CC  And, Wally, I have this sextant star count PAD
that I can give you any time.
06 01 56 06  CDR  We'll wait till we finish this one landmark
here.
06 01 56 08  CC  Okay. No hurry.
06 01 56 09  CDR  Roger.
06 01 56 24  CDR  Got five marks.
06 01 58 26  CMP  Houston, Apollo 7.
06 01 58 29  CC  Go ahead, 7.
06 01 58 30  CMP  Roger. Are you getting the data off of the
computer?
06 01 58 34  CC  Affirmative.
06 01 58 36  CMP  Roger. This is the alternate navigator doing the marking.

06 01 58 41  CC  Roger.

06 01 58 42  CMP  And we again got all zero's on the DELTA-R - DELTA-V updates, and we have some changes to the landmark location on the lat, long, and attitude. It turns out that point is 3600 feet under water.

06 01 58 57  CC  Okay. Roger. Copy that.

06 01 59 02  CMP  We took a sounding.

06 01 59 11  CDR  Your weather looks good out on the Gulf. No thunderheads, a little bit of scattered cirrus way south of Beaumont, and that's just about it.

06 01 59 19  CC  Roger.

06 01 59 22  CDR  Nothing west of you. All the way over to Freeport, it's clear as a bell.

06 01 59 41  CC  Wally, we're trying to save some CAL 25 weather for you.

06 01 59 45  CDR  Yes, I would like to get some of that. This isn't bad sailing here. Got a pretty big spinnaker out now.

HAWAII through ANTIGUA (REV '93)

06 02 00 00  CDR  Thanks for getting that storm out of the way. I appreciate that.

06 02 00 05  CC  Okay. Let me know when you are ready to copy that sextant star count PAD.
06 02 00 42  CC  And, Wally, something else that you might note here. We didn't copy any indication of a canister change or of the \( \text{O}_2 \) purge which was about 4 hours ago.

06 02 00 55  CDR  Yes, we've made number 12 canister change and the \( \text{O}_2 \) purge.

06 02 00 59  CC  Okay. I understand they are both complete.

06 02 01 06  CDR  Four optical on the \( \text{O}_2 \) purge?

06 02 01 09  CC  Roger. That was the one at 141 30.

06 02 01 17  CDR  We didn't check that off; we owe you that one; the canister was changed.

06 02 01 21  CC  Okay. Copy that.

06 02 01 22  CMP  Roger. We were busy TV-ing it, I think, about purge time.

06 02 01 27  CDR  Yes, we were on camera then. You know we weren't doing it.

06 02 01 30  CC  Roger. That is why we thought we would just ask.

06 02 01 32  CDR  Oh, you're sneaky.

06 02 01 34  CMP  Very good.

06 02 01 37  CDR  Now you know why we don't like the TV cameras.

06 02 01 40  CMP  Ready on the update.

06 02 01 43  CC  Okay. This is star 23, roll 352, pitch 041, yaw 006; star 31, the same roll, pitch, and yaw settings. This will get you within these stars are within 35 degrees of the sun LOS.

06 02 02 17  CMP  Roger. GET of sighting?
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 02 02 20</td>
<td>CC</td>
<td>Roger. 147 plus 31.</td>
</tr>
<tr>
<td>06 02 02 27</td>
<td>CMP</td>
<td>Same number for both of them?</td>
</tr>
<tr>
<td>06 02 02 31</td>
<td>CC</td>
<td>Roger. That is the same number for both.</td>
</tr>
<tr>
<td>06 02 03 18</td>
<td>CMP</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>06 02 03 20</td>
<td>CC</td>
<td>Go ahead, 7.</td>
</tr>
<tr>
<td>06 02 03 25</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>06 02 03 26</td>
<td>CMP</td>
<td>Roger. I was wondering if we could - if we could get an update for these 23 lunar landmark stars business?</td>
</tr>
<tr>
<td>06 02 03 36</td>
<td>CC</td>
<td>Okay -</td>
</tr>
<tr>
<td>06 02 03 37</td>
<td>CMP</td>
<td>Like some attitude to fly to and the approximate time to do it. I could find it by myself, but it might help a little if we had some ideas as to what - I mean, what roll angle or pitch angle it will be in.</td>
</tr>
<tr>
<td>06 02 03 50</td>
<td>CC</td>
<td>Okay. In work.</td>
</tr>
<tr>
<td>06 02 03 51</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>06 02 03 53</td>
<td>CDR</td>
<td>Jack, frames 145, 146, and 147 were taken at 03 - at 03 minutes.</td>
</tr>
<tr>
<td>06 02 04 10</td>
<td>CDR</td>
<td>Houston, do you copy?</td>
</tr>
<tr>
<td>06 02 04 11</td>
<td>CC</td>
<td>Roger. Copy that.</td>
</tr>
<tr>
<td>06 02 04 13</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 02 06 38</td>
<td>LMP</td>
<td>Frame 178 taken at 07 30.</td>
</tr>
<tr>
<td>06 02 06 44</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 02 06 49</td>
<td>LMP</td>
<td>That's on magazine Sierra.</td>
</tr>
<tr>
<td>06 02 06 52</td>
<td>CC</td>
<td>Copy.</td>
</tr>
</tbody>
</table>
06 02 08 25 IMP Frames 149, 150 taken at 07 35. ... in minutes and seconds.
06 02 08 39 CC Copy.
06 02 08 46 CDR We must be doing a bit more tracking today.
06 02 08 52 CC Say again, Wally.
06 02 08 54 CDR Did we do perigee?
06 02 08 57 CC You are just passing perigee now.
06 02 09 04 CDR Okay. We got a pitch rate change for nothing.
06 02 09 06 CC Okay. Copy.
06 02 09 10 CDR ... pitched up ... degrees local vertical way back up to SCS.
06 02 09 23 CC I didn't copy that last, Wally.
06 02 09 25 CDR That was pitch down 30 degrees, and it came right back up, almost to SCS. I had to stop it.
06 02 09 32 CC Okay. Copy.
06 02 09 38 CDR We've got an outside station coming in beautifully right now. It seems like every time we come through here.
06 02 09 46 CC Roger. Understand.
06 02 09 47 CDR Playing "True Love."
06 02 10 24 IMP Roger. We are stable now right at the perigee attitude.
06 02 10 29 CC Roger. Copy. We are about 1 minute LOS Antigua; we pick you up over Ascension at 146 plus 19.
06 02 10 39 IMP Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 02 20 04</td>
<td>CC</td>
<td>Apollo 7, Houston through Ascension.</td>
</tr>
<tr>
<td>06 02 20 11</td>
<td>IMP</td>
<td>Roger —</td>
</tr>
<tr>
<td>06 02 20 12</td>
<td>CMP</td>
<td>Roger. Jack, we just had a very anomalous sort of pass here — wrote it in the data off our book ... by block 42 ... did the marks and the thing came into view about a minute and a half earlier than the time you gave us. It was away off to the north, more than just 18 miles; in fact, they had to yaw 20 degrees to even be able to see it, and anyway, managed finally to get two marks on it before we lost it. They got three new updates for DELTA-R DELTA-V, but they got some huge changes on the landmark coordinates.</td>
</tr>
<tr>
<td>06 02 20 52</td>
<td>CC</td>
<td>Okay. We copied that, Donn.</td>
</tr>
<tr>
<td>06 02 20 58</td>
<td>CMP</td>
<td>It's conceivable he could have marked on the wrong point, but I don't think he could have been that far off.</td>
</tr>
<tr>
<td>06 02 21 03</td>
<td>CC</td>
<td>Okay. We have some information on this P23 moon star sighting.</td>
</tr>
<tr>
<td>06 02 21 12</td>
<td>CMP</td>
<td>Okay. Stand by.</td>
</tr>
<tr>
<td>06 02 21 30</td>
<td>F</td>
<td>FAL Flight. I'm still standing by for your reply.</td>
</tr>
<tr>
<td>06 02 21 47</td>
<td>F</td>
<td>Attitude? Right.</td>
</tr>
<tr>
<td>06 02 22 05</td>
<td>CMP</td>
<td>Roger. Go ahead with your update, Jack.</td>
</tr>
</tbody>
</table>
Okay, Donn. At a GET of 146 plus 00 plus 00, a roll of 347, pitch 097, yaw of 011 should be the landmark line of sight on the moon.

Roger. Stand by, Jack. My pencil crapped out.

Roger. I've got 146 on the hour. Is that right?

No, sir. 146 plus 40 plus 00, the roll 347, pitch 097, yaw 011 will put the landmark line of sight on the moon.

Okay.

TANANARIVE (REV 93)

Apollo 7, Houston.

Go ahead.

Apollo 7, Houston.

Roger.

Donn, we got real poor COMM here at Tananarive; like to give you an updated GET for this moon star sighting of 147 plus 00 plus 00.

... Jack. Is that a landmark?

Roger. That's P23, moon star sighting. Time should be 147 plus 00 plus 00.

... must be a little late on that.

Okay.

... I had about 40 minutes of ATTITUDE HOLD giving.

Roger. Copy.

We're in ATTITUDE right now.
06 02 39 12    CC    Copy.
06 02 39 17    LMP    Hey, Jack. Log another food bag failure — corn
            chowder today, meal 3 ...
06 02 39 26    CC    Walt, I didn't copy that; COMM is pretty poor
            here over Tananarive because of the low eleva-
            tion angle on the antenna. We would like you
            to switch your IMP power to AUX for this COMM
            test that we are going to do over Guam.
06 02 39 43    LMP    Roger. When do you want me to switch?
06 02 39 46    CC    Right now, Walt.
06 02 39 50    LMP    Okay. Done.
06 02 39 52    CC    Roger.
06 02 40 35    CC    7, we are about 1 minute LOS Tananarive; we
            have a real low angle pass at Carnarvon 146 plus
            52.
            CARNARVON (REV 93)
06 02 51 44    CMP    ... butterscotch pudding, but nobody'll take it.
            Walt and Wally are trying to con me out of my
            ham and applesauce by offering me a whole meal
            for it.
06 02 52 04    CC    Apollo 7, Houston.
06 02 52 07    CMP    Roger.
06 02 52 09    CC    Roger. We just got you in the middle of your
            transmission, Donn. Could you say again?
06 02 52 14    CMP    Roger. We were just recording some comments
            on our food up here.
Okay.

We were saying that Wally and I were trying to give away our butterscotch pudding, but nobody wants it. Walt likes to collect cocoa, so we can give our cocoa to him, and both of them were trying to con me out of my ham and applesauce. Walt offered me a whole meal for one dish. I guess the message is that we get a little tired of the very rich sweet things, and we still go for the meats and the fruits and the salads.

Okay. Copy that.

I tried to call you before over the last station. I had a corn chowder bag failure, the second one of this type. It failed down where the spout comes out. It's failed down - right down where it goes into the bag itself, and the meal comes out some other hole.

Okay. Copy that.

And it always happens to my favorite food.

Roger. This is about the best COMM we've had. It's an elevation angle less than 1 degree.

That's pretty sensational.

We're 1 minute LOS Carnarvon; we'll pick you up at Guam at 1h7 plus 01.

Okay.
GUAM (REV 93)

06 03 01 53  CC   Apollo 7, Houston through Guam.
06 03 01 58  IMP   Roger.
06 03 02 00  CC   Walt, will you turn up your S-band volume?
                   We'll start this COMM load check.
06 03 02 08  IMP   S-band volume up.
06 03 02 09  CC   Okay.
06 03 02 42  CC   Apollo 7, Houston.
06 03 02 44  IMP   Roger. Houston, I'm reading you loud and clear.
06 03 02 46  CC   You are loud and clear, also. Wait, up over
                   Hawaii, we're going to have a state vector and
                   DAP load update for you - to send you.
06 03 03 05  IMP   Roger.
06 03 03 12  CC   And after the DAP data load, we'd like to get
                   a verification of NOUN 47 and NOUN 48. This
                   is —
06 03 03 22  IMP   You'd like verification of what?
06 03 03 24  CC   NOUN 47 and NOUN 48 in the DAP data load.
06 03 03 33  IMP   Roger. Understand. So we'll go to ACCEPT on
                   your call over Hawaii.
06 03 03 37  CC   Okay. Real fine.
06 03 04 43  CC   Wait, if you're ready, I can give you the NAV
                   check for this update over Hawaii - I can give
                   it to you now.
06 03 04 59  IMP   We'll pick it up at Hawaii while you are up-
06 03 05 02  CC  Okay. No problem.
06 03 05 31  LMP  Houston, Apollo 7.
06 03 05 33  CC  Go ahead, 7.
06 03 05 38  CC  Go ahead, Apollo 7.
06 03 05 41  LMP  Donn's turning his S-band up. He wants to give you his data.
06 03 05 45  CMP  Houston, Apollo 7.
06 03 05 46  CC  Go ahead.
06 03 05 47  CMP  Roger. I don't know if you read this on the computer. I've got P23 up, and I've got Alphard placed on landmark 5 on the moon, and these are the shaft and trunnion angles. Do you read them down there?
06 03 05 59  CC  Roger. I'm copying them.
06 03 06 00  CMP  Okay. I'll tell you that was one whale of a lot easier than that crazy earth horizon business.
06 03 06 12  CC  Roger. Copy.
06 03 08 59  CC  Apollo 7, Houston. One minute LOS Guam; Hawaii at 147 plus 16.

HAWAII through TEXAS (REV 93)

06 03 17 07  CC  Apollo 7, Houston through Hawaii.
06 03 17 22  CC  Apollo 7, Houston.
06 03 17 25  LMP  Roger. Five-by.
06 03 17 26  CC  Okay. If you will go to ACCEPT, we will send you a NAV load and then a DAP update.
06 03 17 45 CDR Houston, can we wait on this pass? We've got a DTO going here, and we need the computer for it.
06 03 17 51 CC Okay. That is fine.
06 03 17 54 IMP I'll take the PAD for the NAV check.
06 03 17 57 CC Okay. Get 154 plus 30 plus 0000 plus 1486 plus 03274 1368.
06 03 18 20 IMP Roger. Jack, we will take your update. We are in ACCEPT.
06 03 18 25 CC Okay. Coming up.
06 03 18 28 IMP Okay. Readback follows: 154 30 four balls plus 1486 plus 03274 1438. Over.
06 03 18 38 CC Negative on the last one, Walt: 1368.
06 03 18 43 IMP 1368. Sorry.
06 03 19 28 CC Apollo 7, Houston.
06 03 19 30 CDR Go ahead.
06 03 19 32 CC Okay. Wally, we are gradually picking up an increase in CO₂ there. You may have gotten a bad canister at that last change.
06 03 19 42 CDR Roger. See on this particular test here, by the way, this very brilliant star count test has us right up in the perigee torque area. We are going to really hose the fuel out.
06 03 19 56 CC Okay. Copy that.
06 03 19 59 CDR Now this one is on the experimenters, too. We are going to have some right interesting comments to make about celestial navigation when we get back.
06 03 20 11 CC There are going to be a lot of people who are going to be interested.
06 03 20 16 IMP Hey, Jack, we are like reading 1mm; shouldn't we go ahead, let this thing hang in here until it gets up close to 76?
06 03 20 24 CC Roger. We are just trying to give you a little bit of a hack ahead of time, so you will know what to look for.
06 03 20 30 IMP Well, our criteria is 76, so we have not been concerned. It's just turned out to be the first one we've ever seen over one, that's all.
06 03 20 37 CC Roger.
06 03 21 26 CDR May we have the computer?
06 03 21 29 CC Roger. 7, we would like to verify the DAP data load. Not at this time, but some time later on. We would just like a verification on NOUN 47 and 48 in the DAP data load prior to tomorrow's burn. The computer is yours at this time.
06 03 27 18 IMP Houston, Apollo 7.
06 03 27 21 CC Go ahead, Apollo 7.
06 03 27 23 IMP Roger. NOUN 47 plus two balls 164 plus -
06 03 27 41 IMP Did you read?
06 03 27 43 CC Apollo 7, Houston.
06 03 27 45 IMP Roger. Jack, did you read NOUN 47?
06 03 27 47 CC Negative. Walt, you got it just as we were handing over stations here. Could you say it again?
06 03 27 54 LMP Can you read our DSKY? Can you read out DSKY, Jack?
06 03 28 03 CC Negative right now, Walt.
06 03 28 05 LMP Okay. \textit{HOUN} 47 plus two balls 164 plus two balls 551 plus 29560. \textit{HOUN} 48 minus three balls 76 minus three balls 47 plus 02110. Over.
06 03 28 24 CC Okay. We copy that. Could you place your PMP power to \textit{NORMAL}?
06 03 28 30 LMP It's in \textit{NORMAL}.
06 03 28 31 CC Copy.
06 03 28 36 LMP Hey, Jack, somebody might write down and leave it on my desk for when I get back how many different \texttt{COMM} modes they've checked out on this flight.
06 03 28 44 CC Okay. We'll get it to you.
06 03 30 06 LMP Hey, Jack, do you have time for a map update?
06 03 30 10 CC Map update in work.
06 03 30 59 CC Apollo 7, Houston. Opposite omni. And I have your map update.
06 03 31 04 LMP Roger.
06 03 34 11 CC Apollo 7, Houston. Opposite omni. I have your map update.
06 03 34 14 LMP Go, Jack.
06 03 34 15 CC Roger. \textit{REV} 93, time of the node 146 plus 58 plus 58, longitude 122.4 east.
06 03 34 41  CC  We are about 1 minute LOS. We'll pick you up at Tananarive at about 148 plus 09.

TANANARIVE (REV 94)

06 04 11 40  CC  Apollo 7, Houston through Tananarive.

06 04 11 45  CDR  Roger. Jack, read you loud and clear.

06 04 11 47  CC  Wally, I would like to ask you if you powered down?

06 04 11 52  CDR  Affirmative.

06 04 11 53  CC  Okay. Thank you.

06 04 11 55  CDR  Find our suit - heat rate must have peaked about - a suit temperature of about 64 degrees just before power down - and held there for a while after power down. Assuming that it will improve with power up plus holding real great for 4 to 5 minutes, and then it's pretty hot. We felt the heat very easily. Read that?

06 04 12 26  CC  Roger. You were a little big garbled, but I think we’ve got most of it.

06 04 12 34  CDR  Okay. On the star check: only the two stars called up by the program were seen, no others with the sextant.

06 04 12 48  CC  Roger. Understand.

06 04 12 51  CDR  And today will be very busy, and tomorrow, we have the big burn - burn 5.

06 04 12 58  CC  Go ahead.

06 04 13 00  CDR  We are deleting the TV pass tomorrow.
06 04 13 13 CDR Houston, Apollo 7.
06 04 13 22 CC Roger. We copy that. We are digesting that, Wally.
06 04 13 19 CDR Say again.
06 04 13 21 CC We copy all that.
06 04 13 23 CDR ... back today, and it looked awful ... I didn't want to do it before our first burn, but it can foul up our time lines considerably.
06 04 13 34 CC Roger. Copy.
06 04 13 37 CDR Roger.
06 04 13 43 CDR That's about all I have for you.
06 04 14 07 CC Apollo 7, Houston.
06 04 14 09 CDR Go ahead.
06 04 14 11 CC Wally, is the suit temperature or cabin temperature getting a little more comfortable now that you have powered down?
06 04 14 18 CDR That's affirm. I should have told you: we are down to about 68 degrees right now.
06 04 14 23 CC Okay. Copy.
06 04 14 25 CDR We're doing fine.
06 04 14 44 CDR Jack, in your planning for subsequent maneuvers, you should try to avoid being out at SCS or PVS at more than 20 degrees as you pass through perigee. Over.
06 04 14 58 CC Okay. I copied that, Wally.
06 04 15 00 CDR Roger. You're going to have to save that -
06 04 15 14  CDR  ... on the fuel and the attitude.
06 04 15 20  CC  Okay. Understand. We are getting pretty close
to LOS Tananarive; we will pick you up at Guam
at 148 plus 36.
06 04 15 29  CDR  Roger.
06 04 15 30  CC  And Mercury at 148 plus 33.

MERCURY (REV 94)
06 04 33 56  CC  Apollo 7, Houston through the Mercury.
06 04 34 00  CDR  Roger. Read you loud and clear.
06 04 34 05  CC  Roger. Read you also.
06 04 34 10  CDR  ... about 25 minutes ...
06 04 34 23  CDR  Hey, Jack.
06 04 34 24  CC  Go ahead, Wally.
06 04 34 26  CDR  Okay. I guess we'll chlorinate water tonight,
about 139 50.
06 04 34 33  CC  Okay. Wally, you're about two-by here; you're
pretty garbled. We might have a little better
luck over Guam, which is coming up here.
06 04 34 44  CDR  Okay. We will chlorinate water today.
06 04 34 55  CC  Okay. We understand.

GUAM (REV 94)
06 04 37 56  CDR  Hello, Houston, Apollo 7. Do you read?
06 04 37 59  CC  Roger. Go ahead, Apollo 7.
06 04 38 02  CDR  Have you had a chance to work up our fuel status
after today's operations?
06 04 38 09 CC Okay. Understand you want to get a present fuel status - fuel status now?
06 04 38 15 CDR That's affirm; any time.
06 04 38 18 CC Okay. We are summarizing that now; we'll probably have it up to you over Hawaii.
06 04 38 22 CDR Very good.
06 04 38 35 CC Apollo 7, your fuel number for your onboard chart is 666.
06 04 38 45 CDR Roger. Readback: 666.
06 04 41 37 CC Apollo 7, Houston. One minute LOS Guam; Hawaii at 148 plus 51.
06 04 41 44 CDR Roger.

HAWAII through HUNTSVILLE (REV 94)
06 04 51 21 CC Apollo 7, Houston through Hawaii.
06 04 51 24 CDR Loud and clear.
06 04 51 27 CC Okay. Walt, I've got a little message for you here.
06 04 51 33 CDR Walt's off COMM right now. Do you want me to relay, or should I get him up?
06 04 51 40 CC Okay. Wally, are you in the right seat?
06 04 51 44 CDR Say again.
06 04 51 45 CC Can you get in the right seat to do some readings of a couple of gages here?
06 04 51 50 CDR Stand by.
06 04 52 04 CDR Go ahead.
Okay. Wally, prior to this, fan tank - O2 tank 2 fan cycle that we are going to give you here, we would like to read out phase A, B, and C on AC bus 2.

Roger. Phase A is 150.5, B 115.5, and C 115.

Okay. Now, Wally, we would like to turn O2 fans tank 2 ON now, and then read out A, B, and C again.

Got the fans tank 2 ON now. Phase A is - went up just a smidgen - 116, B is about 115.7, and C is still 115.

Okay. Wally, after 3 minutes of fan ON, we would like to have you be reading AC 2 phase B when you turn the fans OFF.

Prior to, or subsequent?

Right during the switch operation, when you turn the fans in tank 2 OFF, be reading phase B.

Okay. I'd say that's a pretty good job of sacking out that AC 1, AC 2 problem, anyway.

I didn't copy that, Wally.

That's a good job down there of sacking out that AC bus 1, AC bus 2 problem.

Roger. Thank you.

I was kind of a crank when it first happened.

I don't blame you a bit.

I like to feel direct - direct coming home.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 04 55 05</td>
<td>CDR</td>
<td>Hey, Jack, you with me?</td>
</tr>
<tr>
<td>06 04 55 07</td>
<td>CC</td>
<td>Roger, Wally. Go ahead.</td>
</tr>
<tr>
<td>06 04 55 08</td>
<td>CDR</td>
<td>Would you ask someone in the support room how many frames per foot there are in the 16mm camera?</td>
</tr>
<tr>
<td>06 04 55 18</td>
<td>CC</td>
<td>Okay. We'll get it.</td>
</tr>
<tr>
<td>06 04 55 21</td>
<td>CDR</td>
<td>Thank you.</td>
</tr>
<tr>
<td>06 04 56 10</td>
<td>CDR</td>
<td>Hey, Jack, do you read?</td>
</tr>
<tr>
<td>06 04 56 11</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>06 04 56 13</td>
<td>CDR</td>
<td>Okay. We just ran the switch valve test, and Walt looked at the phasing light on the switch; it dropped a smidgen - maybe a quarter of a volt to half a volt.</td>
</tr>
<tr>
<td>06 04 56 24</td>
<td>CC</td>
<td>Okay. Thank you very much, Wally. I have some RCS redline data for you.</td>
</tr>
<tr>
<td>06 04 56 31</td>
<td>CDR</td>
<td>Stand by.</td>
</tr>
<tr>
<td>06 04 56 40</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>06 04 56 41</td>
<td>CC</td>
<td>Okay. For service module - for an SCS service module RCS deorbit, the value is 581.</td>
</tr>
<tr>
<td>06 04 56 55</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 04 56 56</td>
<td>CC</td>
<td>Okay. For adapt RCS deorbit, the value is 520; and the value for hybrid deorbit, the value is 223.</td>
</tr>
<tr>
<td>06 04 57 14</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 04 57 15</td>
<td>CC</td>
<td>Okay. We show quad A is just a smidgen under the SCS redline but has ample margin for adapt deorbit.</td>
</tr>
</tbody>
</table>
Roger.

06 04 57 31 CDR Jack, on these landmark sightings that you call up to us for targets of opportunity —

Roger.

06 04 57 39 CC — if you all could keep book on that — we missed Luzon this last pass; we might have had a whack at it. It's kind of hard to remember all those ...

06 04 57 52 CC Okay. You are a little bit hard to read. We'll pick it up on the recorder here.

06 04 57 58 CDR On the landmark passes?

06 04 58 00 CC Yes. Go ahead.

06 04 58 02 CDR If you can give us the time when they come up, whenever, that helps us quite a bit because we can write it on the flight plan.

06 04 58 09 CC Okay. Real fine. After we hand over to Huntsville — to — we get through to Huntsville here, we are going to hand over to ARIA so you might turn up your S-band volume. In a couple of minutes, we'll have ARIA coverage on S-band for about another 4 or 5 minutes.

06 04 58 27 CDR Very good. That was a good watch today, Jack.

06 04 58 31 CC It's been a good day; we've done a lot.

06 04 58 35 CDR We sure did.

06 04 58 39 CC We're looking forward to tomorrow.
<table>
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<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 04 58 41</td>
<td>CDR</td>
<td>Real fine.</td>
</tr>
<tr>
<td>06 04 59 38</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>06 04 59 41</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>06 04 59 42</td>
<td>CC</td>
<td>Okay. Wally, on that question that you asked: the 16mm camera frame, there are 40 frames per foot of film.</td>
</tr>
<tr>
<td>06 04 59 58</td>
<td>CDR</td>
<td>How many feet do we have in each magazine?</td>
</tr>
<tr>
<td>06 05 00 02</td>
<td>CC</td>
<td>I didn't copy that last little, Wally.</td>
</tr>
<tr>
<td>06 05 00 06</td>
<td>CDR</td>
<td>How much footage do we have in the magazine?</td>
</tr>
<tr>
<td>06 05 00 11</td>
<td>CC</td>
<td>Okay. Stand by.</td>
</tr>
<tr>
<td>06 05 00 27</td>
<td>CC</td>
<td>Wally, there are 130 feet per magazine.</td>
</tr>
<tr>
<td>06 05 00 34</td>
<td>CDR</td>
<td>Roger. Thank you, Jack.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ARIA 3 (REV 94)</td>
</tr>
<tr>
<td>06 05 02 10</td>
<td>CC</td>
<td>ARIA 3, go REMOTE.</td>
</tr>
<tr>
<td>06 05 02 19</td>
<td>CT</td>
<td>REMOTE.</td>
</tr>
<tr>
<td>06 05 02 59</td>
<td>CC</td>
<td>Apollo 7, Houston through ARIA.</td>
</tr>
<tr>
<td>06 05 03 03</td>
<td>IMP</td>
<td>Houston, Apollo 7. Standing by.</td>
</tr>
<tr>
<td>06 05 03 07</td>
<td>CC</td>
<td>Houston standing by also.</td>
</tr>
<tr>
<td>06 05 06 57</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS ARIA; pick you up at Tananarive at 149 plus 42.</td>
</tr>
<tr>
<td>06 05 07 06</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TANANARIVE (REV 95)</td>
</tr>
<tr>
<td>06 05 43 42</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive.</td>
</tr>
<tr>
<td>06 05 44 29</td>
<td>CC</td>
<td>Apollo 7, Houston, Tananarive. Standing by.</td>
</tr>
<tr>
<td>06 05 50 15</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS; Mercury at 06.</td>
</tr>
<tr>
<td>Time</td>
<td>Mode</td>
<td>Text</td>
</tr>
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<td>--------</td>
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<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>06 05 50 20</td>
<td>CDR</td>
<td>Roger. We read you.</td>
</tr>
<tr>
<td>06 05 50 25</td>
<td>CC</td>
<td>Roger. I read you that time.</td>
</tr>
<tr>
<td>06 05 50 28</td>
<td>CDR</td>
<td>Good evening, Ron.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>MERCURY (REV 95)</strong></td>
</tr>
<tr>
<td>06 06 06 38</td>
<td>CC</td>
<td>Apollo 7, Houston. Standing by.</td>
</tr>
<tr>
<td>06 06 06 42</td>
<td>CDR</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>06 06 06 44</td>
<td>CC</td>
<td>Roger. Same.</td>
</tr>
<tr>
<td>06 06 06 48</td>
<td>CDR</td>
<td>Donn Eisele wants 20 clicks of water logged and two aspirin.</td>
</tr>
<tr>
<td>06 06 06 52</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 06 07 09</td>
<td>LMF</td>
<td>Hey, Ron, log the LMP with 15 clicks of water.</td>
</tr>
<tr>
<td>06 06 07 15</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 06 07 24</td>
<td>CDR</td>
<td>How's it going down there?</td>
</tr>
<tr>
<td>06 06 07 26</td>
<td>CC</td>
<td>Real fine; beautiful day down here today.</td>
</tr>
<tr>
<td>06 06 07 29</td>
<td>LMF</td>
<td>We got some beautiful pictures of it.</td>
</tr>
<tr>
<td>06 06 07 32</td>
<td>CC</td>
<td>Very good.</td>
</tr>
<tr>
<td>06 06 07 36</td>
<td>LMF</td>
<td>You guys getting tired of this long flight or anything?</td>
</tr>
<tr>
<td>06 06 07 41</td>
<td>CC</td>
<td>No, not really. I'd like to be there with you.</td>
</tr>
<tr>
<td>06 06 07 44</td>
<td>CDR</td>
<td>We got room</td>
</tr>
<tr>
<td>06 06 07 46</td>
<td>CC</td>
<td>Good.</td>
</tr>
<tr>
<td>06 06 07 48</td>
<td>CDR</td>
<td>That hurricane was really something to see. It stood out very clearly today.</td>
</tr>
<tr>
<td>06 06 08 34</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>06 06 08 37</td>
<td>CDR</td>
<td>Go.</td>
</tr>
<tr>
<td>06 06 08 38</td>
<td>CC</td>
<td>Roger. We concur on negative TV tomorrow.</td>
</tr>
</tbody>
</table>
Apollo 7, Houston. Looks like pins have come undone again on LMP's BIOMED harness somewhere in there.

Okay. Roger. We'll get it glued together.

Okay. Ron, I'll get on it. The reason for that is because I've got kind of a spider's web of leads down here. Even after they made this harness over, I've got about 6 inches extra on one lead, and a couple others are apparently pretty tight, I guess.

Roger. I understand.

But I've got this ground wire on, so whatever you do comes through good, doesn't it?

It was real good for a long time there, Walt; then last night, we noticed that it looked like maybe the ground lead was possibly coming partially loose or something like that.

The sensor, that is.

Okay. I'll take a look at it.

I've got a one-line update to your targets of opportunity for two balls 5; that's two balls 5.

Go.

Roger. It's the area north of the Colorado River.
North of the Colorado River? Seriously?
Roger. Evidently it must be in the mountains up in there cause the river runs -
The Colorado River runs north and south. That sounds like Alaska.
Me, too.
Ron, we're trying to figure out, just for the fun of it, what does burn 5 do to our inclination? Does anybody have a story on that handy? It's no big deal, just curious.
Roger. Will check into it; I've got the -
Apollo 7, Houston. Opposite omni.
Ron, while I'm looking at it, do you have any typhoons in the Far East, or ... in the Philippines?
I'll check on it. I don't recall seeing any on the map there this evening.
Hawaii and Australia, wooly woolies?
Apollo 7, Houston. About 1 minute to LOS.
Roger.
Now, your preburn inclination is 31.22 and post-burn 30.08; GETI will be about 165 plus 00.
We thought we'd drive it in a little bit. Okay.
And DELTA-V 1646, burn about a minute and 6 seconds.
Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 06 14 23</td>
<td>CDR</td>
<td>North of the Colorado River we won't get to for awhile.</td>
</tr>
<tr>
<td>06 06 14 26</td>
<td>CC</td>
<td>Yes. That's right.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HAWAI'I (REV 95)</td>
</tr>
<tr>
<td>06 06 25 25</td>
<td>CC</td>
<td>Apollo 7, Houston through Hawaii.</td>
</tr>
<tr>
<td>06 06 25 29</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 06 25 31</td>
<td>CC</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>06 06 25 33</td>
<td>CDR</td>
<td>Same.</td>
</tr>
<tr>
<td>06 06 25 38</td>
<td>CC</td>
<td>You're right. Tropical Storm Gloria is due east of Luzon about this time, so you probably saw it when you were going by there.</td>
</tr>
<tr>
<td>06 06 25 45</td>
<td>CDR</td>
<td>Roger. That's what we call a ..., right?</td>
</tr>
<tr>
<td>06 06 25 49</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 06 26 00</td>
<td>CDR</td>
<td>That's two for Apollo 7 now, isn't it?</td>
</tr>
<tr>
<td>06 06 26 04</td>
<td>CC</td>
<td>That's correct.</td>
</tr>
<tr>
<td>06 06 26 13</td>
<td>CC</td>
<td>7, Houston. We've got a new update on the amount of film in your magazines.</td>
</tr>
<tr>
<td>06 06 26 19</td>
<td>CC</td>
<td>You have 80 feet in 16mm magazines.</td>
</tr>
<tr>
<td>06 06 26 25</td>
<td>CDR</td>
<td>Fabulous. Oh, 80 feet rather than 130; that's not fabulous. Okay.</td>
</tr>
<tr>
<td>06 06 26 30</td>
<td>CC</td>
<td>Yes, that's right.</td>
</tr>
<tr>
<td>06 06 26 32</td>
<td>CDR</td>
<td>Okay. I'll have to do my arithmetic over again then. I guess you can save us by telling us how long we can run it, 1 frame, 6 frames, and 16.</td>
</tr>
<tr>
<td>06 06 26 44</td>
<td>CC</td>
<td>Roger. I'll get that information.</td>
</tr>
<tr>
<td>06 06 26 46</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
</tbody>
</table>
We mapped the whole southwest corner of the United States with 1 frame a second on an 16mm lens today.

Okay.

That was from - oh, just west of San Diego all the way through to the hurricane on into Florida.

Roger.

That was done on 80368 movie in case anybody gets excited.

Roger.

Wally, you might be interested; they're not even waiting for you to get back. We're using the third deck there for simulations tonight for the next mission.

I'm sorry I missed that.

Roger. We're using - they're simulating the next mission upstairs tonight.

Very good. Tell them to take better food along with them.

Okay.

Apollo 7, Houston. I have your film run times, there.

Say again, Ron?

Roger. I have your film run time, your 16mm run times.

Okay.
At 1 frame, in 53 minutes 20 seconds.

At 6 frames, it's 8 minutes 54 seconds; at 16, it's 3 plus 20.

Thank you.

Apollo 7, Houston. S-band volume up at 35 plus 30 for ARIA.

Roger. 35 30.

Ron, frame 152 on the Sierra mag was on the big island of Hawaii.

Roger.

HUNTSVILLE (REV 95)

Huntsville AOS.

ARIA 3 (REV 95)

ARIA 3, go REMOTE.

ARIA 3, clear and loud. Go REMOTE.

Apollo 7, Houston through ARIA 3 S-band.

Apollo 7, Houston through ARIA. Over.

Apollo 7, ...

Apollo 7, Houston. You broke up that time; say again.

Roger. ... S-band up ... or not ...

Roger. You're still breaking up.

Roger. Hear you very weak.

Roger. COMM's not too good this time.

... real high squall in the background.

Roger. I copied that.
06 06 38 39     CC Apollo 7, Houston. You should be closer to
              ARIA now. Is the voice any better?
06 06 39 05     IMP Say again, Ron.
06 06 39 11     CC Still not much better. You're still breaking
              up, and I must be coming through quite weak
              still.
06 06 39 42     CC Apollo 7, Houston. One minutes LOS; Tananarive
              at 17.
              TANANARIVE (REV 96)
06 07 18 29     CC Apollo 7, Houston through Tananarive. Standing
              by.
06 07 18 35     CDR Loud and clear.
06 07 18 36     CC Roger. The same.
06 07 23 04     CC Apollo 7, Houston. One minutes LOS; Mercury
              at 41.
06 07 23 11     CDR Roger.
              MERCURY (REV 96)
06 07 41 07     CC Apollo 7, Houston through Mercury. Standing
              by.
06 07 41 11     CDR Roger.
06 07 41 12     CC Loud and clear.
06 07 46 15     CDR Frames 154 and 155 of Japan.
06 07 46 23     CC Roger. Copy.
06 07 46 27     CDR On magazine Sierra.
06 07 46 29     CC Roger.
06 07 46 39     CC 7, Houston. If you've attempted BICMED fix,
              we still have no joy.
Hey, Ron, I went ahead and checked all these things. They're all made up, and I don't think there's anything else I can do, but I'll check them again when I go to bed in a little bit, but they look to me like everything's okay.

Okay. We might have an internal break or something in one of the wires, and we'll work on it later; no sweat.

Along the peak of Mount Fujiya, there's snow on the top.

Say again.

Frame 155 of Mount Fujiya.

Roger.

Apollo 7, Houston through Hawaii.

Roger. Could you give me a readout of our \( O_2 \) manifold pressure?

Roger. We're standing by for lock-up - don't have it yet.

Apollo 7, Houston. We're reading 104 now.

Roger. ... 103.

Roger. 103.

Roger.

Hey, Ron, the redundant component check is GO.

Roger.
06 08 01 31    CC  7, Houston. Sometime when you get a chance there, we could use more or less a taste versus
time summary on your water.

06 08 01 49    IMP  Say again?

06 08 01 50    CC  Roger. We could use a kind of a taste versus
time from chlorination on the potable water.

06 08 02 00    IMP  Well, now you've brought the subject up - you
want to talk to him?

06 08 02 04    CDR  We just put the chlorine in about 15 minutes
ago, just before your pass. We are a little
concerned about the rate to put it in. It's
a rather brown-looking goopy thing at the base
of the chlorine injector, and I'm not sure -
rust or what - but I'm not sure that I'm happy
with it at this time.

06 08 02 40    CC  Roger. Houston. You went through a keyhole
there, and we're still in one, really. At the
base of what? And -

06 08 02 53    CDR  If I had that on my water faucet, I'd clean it
off or get a new faucet.

06 08 03 00    CC  Roger.

06 08 03 07    CDR  If I had it in my swimming pool, I'd call for
pool service.

06 08 03 38    CC  About 30 seconds LOS; Redstone at 46.

06 08 03 43    CDR  Roger.

06 08 03 46    CC  Belay that Red - Redstone at 14.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 08 03 50</td>
<td>CDR</td>
<td>Roger. 1h.</td>
</tr>
<tr>
<td>06 08 15 06</td>
<td>CC</td>
<td>Apollo 7, Houston through Redstone. Standing by.</td>
</tr>
<tr>
<td>06 08 15 10</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 08 15 13</td>
<td>CC</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>06 08 15 16</td>
<td>CDR</td>
<td>... just off Hawaii, we saw a big smoke trail ...</td>
</tr>
<tr>
<td>06 08 15 28</td>
<td>CC</td>
<td>7, Houston. Say it again.</td>
</tr>
<tr>
<td>06 08 15 31</td>
<td>CDR</td>
<td>We saw the smoke trail of a ship at about 07 45 GETI.</td>
</tr>
<tr>
<td>06 08 15 40</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 08 15 41</td>
<td>CDR</td>
<td>Seven minutes 45 seconds. Make Gordo Cooper happy to tell him that one.</td>
</tr>
<tr>
<td>06 08 15 45</td>
<td>CC</td>
<td>It sure will.</td>
</tr>
<tr>
<td>06 08 15 46</td>
<td>CDR</td>
<td>We haven't seen any smoke counts up in the Himalayas, and now it's night, so I guess we're loosers on that one.</td>
</tr>
<tr>
<td>06 08 15 52</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 08 15 56</td>
<td>IMP</td>
<td>Haven't seen any trucks of the Imperial Valley yet, either.</td>
</tr>
<tr>
<td>06 08 16 01</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>06 08 16 03</td>
<td>CDR</td>
<td>We'll look for water skiers on Taylor Lake this weekend.</td>
</tr>
<tr>
<td>06 08 16 08</td>
<td>CC</td>
<td>Very good.</td>
</tr>
<tr>
<td>06 08 18 43</td>
<td>CC</td>
<td>7, Houston. About 30 seconds LOG. Walt, you might be advised it's the sternal connectors on the BIOMED that seem to be acting up.</td>
</tr>
</tbody>
</table>
06 08 18 52 LMP Did you say the sternal connectors?
06 08 18 54 CC Affirmative.
06 08 18 56 LMP Okay. I'll check it over good before I go to bed.
06 08 18 59 CC Roger.
06 08 19 00 CDR We'll have all of that just to ...
06 08 19 12 LMP I took care of my stern problem.
06 08 19 16 CC Roger.

ASCENSION (REV 97)
06 08 41 41 CC Apollo 7, Houston through Ascension.
06 08 41 44 CDR Roger. Thank you.
06 08 41 46 CC Roger. Loud and clear.
06 08 41 54 LMP Anything more on the news down there, Ron?
06 08 42 01 CC Roger. We're working on some.
06 08 42 04 LMP Okay. Anybody have the Lima Sierra update?
06 08 42 10 CC Roger. Your hydrogen margin is 2.6 pounds now;
your O₂ margin is 58 pounds; Lima Sierra 073/061, Sierra Foxtrot 075, Echo Kilo plus 003.
06 08 42 57 LMP Roger. Thank you.
06 08 43 21 CC The Olympics are getting started tonight some-
time; we don't have any information coming in on that yet.
06 08 43 29 LMP Roger.
06 08 44 10 LMP Hey, Ron. How are the surgeons doing on curing
colds for long range tonight?
06 08 44 17 CC They're still working on it. Some guy down
here is also working - facetiously, that is - to
determine if you would have gotten a cold had you not been flown.

Had we not what?

Had you not taken the flight.

Roger. That's very significant.

I don't know how he's going to do it, but he's working on it.

**MERCURY (REV 97)**

Apollo 7, Houston through Mercury. Opposite omnir.

Roger. Stand by.

Apollo 7, Houston. I have a one-line flight plan update.

Wait one.

The only thing we have to look forward to is China and Japan, so you won't have to write.

Okay. Go, Ron.

Okay. It's at 15h plus 00, a fuel cell O2 purge. This is a little early, but it allows us to get another one in just prior to the burn.

Roger. Hey, Ron, tell the doctors not to worry about the cold. I always understood that it takes a week to get rid of it if you treat it and 7 days if you don't. Tomorrow's our eighth day, so it'll probably be gone.

Roger.
The doctor really confirms that.
Houston. To verify up telemetry MANNE TO NORMAL.
Always.
Roger.
By the way, the guy I was talking about before
on the colds: I just heard that over the news.
It's not one of our guys.
Oh, that's encouraging anyway.
Roger.
Thank God we're not paying that cat.
Concur.
We have a little information here if you are
concerned about maybe the drop in batter volt-
ages that we were --
Go ahead.
Roger. Looks like it's a nominal-type thing.
This downward shift corresponds to a nominal
transition from the test to the plateau. ... and it's --
Roger.
-- It normally happens just about where we
have now, 8 to 14 amp-hours discharge out of
the battery. And we're predicting an end-of-
mission voltage on batt A and B of 30 to
31 volts.
Roger. Right now, we are looking at Fujisan.

Roger. Lot of snow?

The usual white peak.

Ron, how about someone marking our position now, and let us know how far away we were from Fujif?

Wilco.

One fifty nine and 160 - 159 at Shikoku and 160 - long shot - at Fujisan.

Roger.

REDSSTONE (REV 97)

Apollo 7, Houston through Redstone. I have block data number 17.

Ready to copy. Go.

Roger. 099 dash Alfa Charlie minus 028 minus 0180 155 plus 27 plus 54 4608.

Say, Ron, can you be working on a map update while I'm doing this?

Affirmative. 100 dash Alfa Charlie plus 081 minus 0240 157 plus 00 plus 51 4205, 101 dash 2 Charlie plus 205 minus 0239 158 plus 35 plus 56 3799, 102 dash 2 Alfa plus 276 minus 0270 160 plus 10 plus 26 3594, 103 dash 1 Bravo plus 237 minus 0616 161 plus 35 plus 40 3725, 104 dash 1 Alfa plus 297 minus 0627 163 plus 10 plus 40 3533. Over.
Roger. Was 99 Alfa Charlie the first one?
Affirmative.

Minus 028 minus 0180 155 plus 27 plus 54 4608, 100 dash Alfa Charlie plus 081 minus 0240 157 plus 00 plus 51 4205, 101 dash 2 Charlie plus 205 minus 0239 158 plus 35 plus 56 3799, 102 dash 2 Alfa plus 276 minus 0270 160 plus 10 plus 20 3594, 103 dash 1 Bravo plus 237 minus 0616 161 plus 35 plus 40 3725, 104 dash 1 Alfa plus 297 minus 0627 163 plus 10 plus 40 3533. Over.

Roger. In area 102, 2 Alfa, the GETI 160 plus 19 plus 26.

160 plus 10 plus 26. Standing by for the map update.

Roger. REV 97, GET 152 plus 53 plus 56, longitude 31.6 east.

Roger.

Apollo 7, Houston. The United States beat Yugoslavia in basketball today 73 to 58.

Roger.

Now, you might be interested that the stock market is fired by rumors of a possible halt in the bombing of North Viet Nam, bounded ahead today in third highest volume in the exchange history. The volume of 21.06 million; Dow Jones was up 3.60 at 958.91.
06 09 52 17  CDR  Roger. That's the highest on record, isn't it?
06 09 52 21  CC   Not quite sure. I don't think so.
06 09 52 31  CC   It looks like Hurricane Gladys is expected to go ashore in a relatively sparsely populated area of Florida.
06 09 52 42  CDR  That's fortunate.
06 09 52 50  CC   It was also announced today that Mrs. John F. Kennedy will marry shipping tycoon Aristotle Onassis.
06 09 53 00  CDR  Oh, my!
06 09 53 40  CC   Wait, I have your present battery ampere-hours if you have a minute.
06 09 53 45  IMP  Roger. Go ahead with it.
06 09 53 47  CC   Roger. A 30.8, B 28.4, and C is 39.0.
06 09 54 01  IMP  Roger. Thank you.
06 09 54 20  CC   AOS Ascension at 12.
06 09 54 23  IMP  ... Jack.
ASCENSION (REV 98)
06 10 12 28  CC   Apollo 7, Houston through Ascension. Standing by.
06 10 12 36  CMP  Roger. Houston, Apollo 7.
06 10 12 39  CC   Roger. Good morning.
06 10 12 41  CMP  How are you?
06 10 12 43  CC   Good shape.
06 10 12 46  CMP  I'd like to log in two aspirin and 15 clicks of water each for the commander and the LM pilot.
Roger.

Apollo 7, Houston. Opposite omni.

Roger.

Apollo 7, Houston. LOS. Mercury at 49.

Roger.

**MERCURY (REV 98)**

Apollo 7, Houston through Mercury.

Apollo 7, Houston through Mercury. Standing by.

Roger. Houston, Apollo 7.

Roger. Loud and clear.

Ron, this Donn. I'd like to register a strong complaint on the lithium hydroxide storage cans on the floor. That - A2, I believe is the number - they're the ones that are under Wally's couch. They're an old type of box left over from Block I. And the lids: it takes a tremendous amount of force to make them close. They're just not suitable at all.

Roger. I understand.

The new type ones with the rounded corners and the new latches are great, and they come in ...

Roger.

**GUAM (REV 98)**

Apollo 7, Houston. Opposite omni.

Apollo 7, Houston. Request you turn O2 tank 2 fan on for 5 minutes then off.
06 10 57 43  CMP  Roger. 02 going on.
06 10 57 47  CC  Roger.
06 10 59 46  CC  Apollo 7, Houston. One minute LOS; Ascension 20.
06 10 59 59  CMP  Apollo 7. Roger.

Apollo 7, Houston through Redstone.
06 11 20 46  CC  Apollo 7, Houston, Apollo 7.
06 11 20 52  CMP  Roger. Houston, Apollo 7.
06 11 20 55  CC  Roger. Loud and clear. Donn, we would like to
get a rundown on your health status: medication, sleep, and what have you.

06 11 21 05  CMP  Say again.
06 11 21 06  CC  Roger. Just a little resume of your status:
cold, medication, sleep.
06 11 21 15  CMP  Roger. I got about 5 hours sleep last night
which seems like enough. I'm not a bit tired.
We still have head colds. My ears are starting
to clear up somewhat, but I still got pretty
stuffy sinuses. Wally and Walt are still com-
plaining of stopped-up ears and head.
06 11 21 37  CC  Roger.
06 11 21 51  CC  And we're assuming no medication on your part
other than reported aspirin.
06 11 21 57  CMP  That's correct. We decided to save the Actifed
till the last day or so.
06 11 22 03  CC  Roger. Another thing for our future flight
planning here on your procedures book in the
control modes, if you could somehow give us a rundown: either number them down the page or something like that, and give me the numbers you have not completed, so we can kind of plan maybe on RCS fuel.

06 11 22 51  CMP  Okay, Ron. I'll do that a little later. I'm trying to eat my breakfast right now.

06 11 22 55  CC  Roger. No hurry.

06 11 22 57  CMP  Yes, I think we've covered most of them, one way or another.

06 11 23 02  CC  Roger.

06 11 23 04  CMP  I don't know whether, or you know how much data got down on the ball, but I think we have been in just about every control mode.

06 11 23 12  CC  Roger.

06 11 23 32  CC  You haven't had any PT for breakfast yet, have you?

06 11 23 44  CMP  Yes, I've got a little bit right here, right now.

06 11 23 47  CC  Roger.

06 11 23 48  CMP  ... anyway. You talking about fortified Tang?

06 11 24 06  CC  Something like that.

06 11 24 32  CC  Apollo 7, Houston. Opposite omni.

06 11 27 09  CC  Apollo 7, Houston. One minute 103; Ascension at 46.

06 11 27 16  CMP  Roger.
ASCENSION (REV 99)

06 11 46 22  CC  Apollo 7, Houston through Ascension.
06 11 47 22  CC  Apollo 7, Houston, Ascension. Standing by.
06 11 52 06  CC  Apollo 7, Houston. Two minutes to LOS; Mercury at 22.
06 11 52 13  CMP  Roger.
06 11 52 16  CC  Roger.
06 11 52 17  CMP  Roger.
06 11 52 19  CC  Houston, go.
06 11 52 32  CC  Apollo 7, Houston. Say again.
06 11 52 39  CMP  Oh, it was nothing. I was just acknowledging.
06 11 52 40  CC  Oh, Roger. Sorry.
06 11 53 23  CC  Apollo 7, Houston. We've lost your BIOMED now.
06 11 53 30  CMP  Roger. BIOMED was disconnected temporarily.
06 11 53 36  CC  Roger.
06 11 53 59  CC  Apollo 7, Houston. Verify O2 tank 2 fan OFF.

MERCURY through GUAM (REV 99)

06 12 23 11  CC  Apollo 7, Houston through Mercury. Standing by.
06 12 23 17  CMP  Roger, Houston.
06 12 23 21  CC  Roger. You're loud and clear.
06 12 23 40  CC  Say, Donn, we've got some more gold medal winners.
06 12 23 45  CMP  Great, who are they?
06 12 23 49  CC  Roger. In swimming, the USA set a new record in the men's 400-meter free style relay in
Also the US women won the 400-meter medley relay in 428.3. That gives us a total of 17 gold medals so far.

Sounds pretty good.

Great.

Apollo 7, Houston. Opposite omni.

Roger.

Apollo 7, Houston. We plan to run through program 5 over Redstone and power down again over the Canaries this pass.

Okay.

Apollo 7, Houston. You ought to be right over typhoon Gloria at this time.

Okay. Thank you. I was looking for it.

I think I see it, Ron. It's just a big mass of white clouds directly beneath me, but I can't get a shot at it. We are not at the right angle.

Roger.

Couldn't discern a particular pattern like we could on Hurricane Gladys. Where is Gladys now anyway?

It's just about to hit the Florida coast down there kind of west of Tallahassee, I think.

Oh.

Apollo 7, Houston. About 1 minute LOS; Redstone at 54.
Hey, Donn, just out of curiosity, were you testing the tissues between Redstone and Ascension on the last pass?

Was I testing what?
The tissues.
Oh, tissues. No, I was taking a bath, as a matter of fact.
Okay.
Houston, Apollo 7.
Houston, go.
Roger. Would like to advise that the tissues have been tested with a reasonable degree of success.

Apollo 7, Houston through Redstone.
Roger. Houston, Apollo 7.
Roger. Loud and clear.
Okay.
Apollo 7, Houston. We're ready for GNC power up.
Okay.
Apollo 7, Houston. Is the urine dump heater still in main A, and have you been cycling it at all?
Roger. It's in main A; we haven't touched it that I know of since we took off.

Roger.

Apollo 7, Houston. Opposite omni.

Roger.

Apollo 7, Houston. LOS. Canaries at 25.

Roger, Ron.

Apollo 7, Houston through Canaries. Standing by.

Apollo 7, Houston at Canary.

Apollo 7, Houston.

Say again.

Roger. Apollo 7, Houston. We'll go on CMC power down.

Okay.

Apollo 7, Houston. One minute LOS; Redstone at 28, and you're in your one-hundredth rev.

Oh. Roger.

Apollo 7, Houston through Redstone.

Apollo 7, Houston. Opposite omni.

Apollo 7, Houston.

Roger. Go ahead, Bill.

Hello, Donn. I thought maybe you weren't reading me. I have a flight plan update when you're ready to copy.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
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<tbody>
<tr>
<td>06 14 31 54</td>
<td>CMP</td>
<td>Okay. Stand by.</td>
</tr>
<tr>
<td>06 14 32 15</td>
<td>CMP</td>
<td>Go ahead, Bill.</td>
</tr>
<tr>
<td>06 14 32 19</td>
<td>CC</td>
<td>Roger. If you'll look at page 2 dash 54, at 160 hours plus 25, delete the fuel cell purge.</td>
</tr>
<tr>
<td>06 14 32 34</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 14 32 36</td>
<td>CC</td>
<td>At 161 plus 10, DAP update.</td>
</tr>
<tr>
<td>06 14 32 58</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>06 14 33 00</td>
<td>CC</td>
<td>162 plus 30, waste water dump. At 163 plus 40, fuel cell O₂ purge.</td>
</tr>
<tr>
<td>06 14 33 36</td>
<td>CMP</td>
<td>Roger. Fuel cell O₂ purge at 163 plus 40.</td>
</tr>
<tr>
<td>06 14 33 40</td>
<td>CC</td>
<td>Affirmative. And if you'll look on the next page 2 dash 55, I have a few items there relative to the burn.</td>
</tr>
<tr>
<td>06 14 33 48</td>
<td>CMP</td>
<td>Okay. Go ahead.</td>
</tr>
<tr>
<td>06 14 33 50</td>
<td>CC</td>
<td>Right. The nominal time now for burn 5 is 165 hours even. It'll be quads Bravo and Delta for the two-jet ullage, MRTC for the last 30 seconds; the burn time will be 66 seconds, and you can delete the reference to battery charging there.</td>
</tr>
<tr>
<td>06 14 34 30</td>
<td>CMP</td>
<td>Okay. Got quads B and D, 165 on the hour, two-jet ullage, and the burn time is 1 minute and 6 seconds. Is that right?</td>
</tr>
<tr>
<td>06 14 34 37</td>
<td>CC</td>
<td>Affirmative. And delete the reference to battery charging.</td>
</tr>
<tr>
<td>06 14 34 48</td>
<td>CMP</td>
<td>Okay. Guess the DELTA-V changed some then, too, didn't it?</td>
</tr>
</tbody>
</table>
06 14 34 53  CC  We'll be updating that, and also — okay. —
06 14 34 57  CMP  Okay.
06 14 34 58  CC  -- the MTVC's for the last 30 seconds.
06 14 35 02  CMP  All right.
06 14 35 06  CC  Okay. That does it.
06 14 35 16  CMP  Okay.
06 14 35 31  CC  Donn, just for your information, the total
                DELTA-V for that burn is 16.66. It'll be on
                the PAD when we send it up.
06 14 35 45  CMP  Okay.
06 14 35 47  CC  Apollo 7, Houston. One minute LOS Redstone;
                Antigua at 49.
06 14 35 55  CMP  Roger. Antigua at 49.
                ANTIGUA (REV 101)
06 14 50 26  CC  Apollo 7, Houston through Antigua.
                CANARY (REV 101)
06 14 58 06  CC  Apollo 7, Houston through Canary.
06 14 59 34  CC  Apollo 7, Houston through Canary.
06 15 02 25  CC  Apollo 7, Houston.
06 15 02 31  CMP  Roger. Go.
06 15 02 33  CC  Roger. Just checking. Now, it's going to be
                about an hour here. See —
06 15 02 43  CMP  Say again, Bill.
06 15 02 52  CC  Roger. It's going to be about 45 minutes before
                next acquisition. I just wanted to get a call
                from you before we had LOS here at Canary.
06 15 03 00  CMP  Yes. Okay. Fine. Everything's fine here.
06 15 03 05  CC  Good. Thank you.
06 15 03 10  CMP  I've got two sleeping beauties and a sound ship.
06 15 03 13  CC  Roger. Donn, how was your sleep last night?
06 15 03 27  CMP  Oh, it was pretty good. Not quite as good as
                  the night before.
06 15 03 31  CC  Roger.
06 15 03 46  CC  We have estimated acquisition Honeysuckle at
                  43. We'll need the S-band volume up, however;
                  it's sort of a fringe pass.
06 15 03 58  CMP  Roger.
06 15 03 59  CC  If we don't get you there, we'll get you at the
                  Redstone on the hour, and that will be about
                  an hour from now.
06 15 04 04  CMP  Okay.

HONEY Suckle (REV 101)
06 15 46 46  CC  Apollo 7, Houston through Honeysuckle. Poor
                  contact.

REDstone (REV 101)
06 16 02 18  CC  Apollo 7, Houston through Redstone.
06 16 02 24  CMP  Roger. Houston, Apollo 7.
06 16 02 28  CC  Say, Donn, this waste water quantity is getting
                  up pretty high, and we've been taking a look at
                  this; it probably would be a good idea perhaps
                  to dump this stuff before you do any NAV sight-
                  ing, well before.
Yes, that's a good idea. Thanks, Bill.
And go ahead and do it anytime, I suppose.
Also, when I was updating the flight plan - if
you have it there, you'll notice there's still
an "H₂ heaters on" at 160 hours and 5 minutes
and, of course, I should have had that deleted.

Roger. I got that.

And, one additional item to catch up on, and
that's this fuel cell O₂ purge at 163/40. This
should be done after the DELTA-V bias test.

Oh, okay.

Thank you.

Apollo 7, Houston. Opposite omni.

Roger.

Houston, Apollo 7.

Go.

Roger. I was just looking ahead. This passive
thermal control DTO -

Roger.

I'm wondering - if we follow the procedure
that's outlined, if we're not going to put
ourselves in that undesirable situation where
we're pointed straight up, or nearly so, in
the lower part of our trajectory - and I'm
wondering if it might not be better to simply
specify the time in which they want the roll
rate—you know, with the three disks to begin—and let us simply get them a few minutes ahead and then C spelling pitch and yaw at the designated time.

Okay. Donn, stand by, and we'll bet that—

- their tight net band for—oh, about 20 minutes before we disable pitch and yaw, and our experience so far indicates that we can do a better job manually in pulse of nulling these pitch and yaw rates anyway.

Roger. We've copied that, and we'll take a good look at that.

Okay. I'm afraid if we do it the way it's outlined, it may cost us a fair amount of fuel, and it may screw up the test as well.

Roger.

Donn, your waste water quantity right now is reading about 88 percent.

Roger. Bill, I think I'll go ahead and dump it now.

Right. Thank you.

Apollo 7, Houston. One minute LOS Redstone; Antigua at 20.

Roger.

APOTIGUA (REV 102)

Apollo 7, Houston through Antigua.
06 16 21 35  CMP  Roger. Houston, Apollo 7.
06 16 21 39  CC   Roger.
06 16 21 49  CMP  Houston, log the CMP 12 clicks on the water gun.
06 16 21 53  CC   Say again the number.
06 16 21 55  CMP  Twelve.
06 16 21 57  CC   Roger. Twelve.
06 16 22 18  CC   Apollo 7, Houston. Opposite omni.
06 16 22 21  CMP  Roger.
06 16 22 41  CC   Donn, we show you down about 53 percent on the waste water, and just bring her right on down to 25 percent.
06 16 22 49  CMP  Okay. Fine. Help me keep an eye on it. Bill, I think I'm going to power up the CMC, the IMU, and everything prior to the next night pass. I was looking ahead here; the burn time now occurs during the night pass which effectively wipes it out as trying to do an alignment, so I'm going to have to start a little early.
06 16 23 13  CC   Okay.
06 16 24 14  CC   Apollo 7, Houston. We will need to send you an update over Carnarvon or Honeysuckle, and that's at about 16 plus 20 nominally, maybe 161 10.
06 16 24 30  CMP  Okay. I'll go ahead and power up everything at 161.
06 16 24 41  CC   Okay.
06 16 26 46  CMP  Houston, Apollo -
06 16 26 49  CC  Apollo 7, Houston. Go.
06 16 26 51  CMP  Roger. Could you give me a map update, please?
06 16 26 54  CC  Roger. Stand by.
06 16 27 25  CC  Apollo 7, Houston. Map update for REV 101:
                 GET 158 plus 48 plus 46, node at 59.3 west,
                 59.3 west.
06 16 27 51  CMP  Roger. Thank you.
06 16 27 54  CC  And we're coming up on LOS Antigua. We'll pick
                 you up at Canaries in about 3 minutes.
06 16 28 01  CMP  Okay.
                 CANARY (REV 102)
06 16 32 15  CC  Apollo 7, Houston through Canary.
06 16 32 19  CMP  Roger.
06 16 33 49  CC  Apollo 7, Houston.
06 16 33 53  CMP  Roger.
06 16 33 54  CC  All right, Donn. I'll be giving you a DAP or
                 send - yes, giving you a DAP PAD and also a
                 maneuver PAD at Carnarvon. That will be about
                 161 plus 10, and I'll have a P27 PAD standing
                 by. Having a little trouble with our uplink
                 at Carnarvon, but that's what we'll be doing
                 when we come up on Australia.
06 16 34 19  CMP  Okay. I want to try and get a few pictures
                 across there, too.
06 16 34 24  CC  Okay.
06 16 34 42  CC  Hey, Donn, are you exercising?
06 16 34 49  CMP
No, I'm soaking up the water that leaks around
the ... when we dump over it.

06 16 34 55  CC
Okay. That answers the question. Our friendly
doctor noticed that you must be scurrying around
there.

06 16 35 12  CMP
Yes, I am. Every time we dump waste water, we
get a big blob of water that leaks out around
this fitting we've put on.

06 16 35 30  CC
Yes.

06 16 35 31  CMP
... without stripping the threads. I think the
problem is that there is no gasket or washer
in it.

06 16 35 40  CC
Yes. Must be quite a nuisance.

06 16 35 46  CMP
Yes. At least, we don't have to do it very
often.

06 16 38 24  CC
Apollo 7, Houston. One minute LOS Canaries.
I'm going to give you a call in a couple of
minutes at AOS Madrid just to check the S-band,
so we need the volume up.

06 16 38 56  CC
Apollo 7, Houston. S-band volume up.

06 17 07 55  CC
Apollo 7, Houston.

06 17 08 03  CMP
Roger. Houston, Apollo 7.

06 17 08 05  CC
Roger. I have a DAP data update and also a
maneuver PAD, and if you'll go to POO and
ACCEPT, we'll send up your new state vector.
06 17 08 15 CMP    Roger. Going to ACCEPT.
06 17 08 24 CC     Okay. Now, Donn, I have the DAP data update.
                   Of course it is brief, and the maneuver PAD
                   will take a little while. You mentioned that
                   you wanted to get some pictures over Australia
                   so - sort of - you might take a look at that
                   and either delay your readback or ask me to
                   delay sending it to you.
06 17 08 47 CMP    All right, Bill.
06 17 08 50 CC     Ready to copy?
06 17 08 53 CMP    All right. I get you. Why don't you give me
                   the DAP data?
06 17 08 55 CC     Okay. DAP data: minus 00078 minus 0049 plus
                   02142. Read back.
06 17 09 23 CMP    Minus three balls 78 minus two balls 49 plus
                   02142.
06 17 09 29 CC     Readback is correct. I'm ready to give you the
                   maneuver PAD when you're ready.
06 17 09 34 CMP    Okay. I think I'll hold up here and get some
                   pictures.
06 17 09 38 CC     Okay. Just let me know when you're ready to
                   copy; and if we run to LOS of Carnarvon, be
                   sure to turn your volume up before Honeysuckle.
                   We'll have Honeysuckle acquisition at about 15.
06 17 09 52 CMP    Okay.
06 17 12 05 CC     Apollo 7, Houston. No need to acknowledge right
                   now, but you've got a GO for a 121 dash 1.
06 17 12 13 CMP  Roger. Thank you.
06 17 13 07 CC  Apollo 7, Houston. You might check your attitude right now.
06 17 13 13 CMP  Okay. Roger.
06 17 13 15 CC  And we're coming up on LOS Carnarvon in about 45 seconds; S-band volume up at 15.
06 17 13 22 CMP  Roger.

HONEYSUCKLE (REV 102)
06 17 16 14 CC  Apollo 7, Houston.
06 17 16 39 CC  Apollo 7, Houston through Honeysuckle.
06 17 17 05 CC  Apollo 7, Houston through Honeysuckle.
06 17 17 31 CMP  Houston, Apollo 7.
06 17 17 33 CC  Roger. How do you read, Donn?
06 17 17 35 CMP  Loud and clear.
06 17 17 37 CC  Okay. Let me know when you're ready to copy the maneuver PAD. And, also, with the previous DAP data update, that was for NOUN 48.
06 17 17 49 CMP  Roger. Understand.
06 17 17 51 CC  And let me know when you're ready to copy the maneuver PAD.
06 17 17 56 CMP  Okay. You can go ahead now.
06 17 18 02 CC  Roger. And before I start, your state vector and target loads are in. Starting to read for 8P8 5 slash PUGS, 16500 0000 plus 01110 plus 16300 plus 02034 2406 plus 0898 17280 29494 minus 078 minus 049 106 34 3548 201 164 18 0000
Page 726

minus 3062 plus 11248 1239 000 000 000. Standing by for readback.

06 17 20 01 CMP
Roger. SPS 5 slash FUGS 16500 0000 plus 01110 plus 16300 plus 02034 2406 plus 0898 17280 29494 minus 078 minus 049 106 34 3548 201 164 18 0000 minus 3062 plus 11248 1239, and all balls for attitude.

06 17 20 45 CC
Roger. And for the attitude, it's out of plane, south, heads up. The NAV check - stand by - comments: MTVC takeover at TIG plus 36 seconds. Additional comments: manual cut-off at DELTA-V counter equal 100 feet per second, sextant star not visible after 164 plus 41. Also, if needed, your R, P, and Y align are 171, 260, 014.

06 17 21 54 CMP
Say, I ran out of room to write. What were those numbers again - the backup alignment?

06 17 22 00 CC
For roll, roll is 171, pitch is 260, yaw 014.
REDSTONE (REV 102)

06 17 37 25 CC
Apollo 7, Houston through Redstone.

06 17 37 30 CMP
Roger, Bill.

06 17 37 35 CC
Roger. I'd like to clarify one item in the comments regarding the bias: the manual cut-off at DELTA-V counter equalled 100 feet per second. I read it as one-zero-zero and just wanted to make sure that you understood there's not a decimal point there.
06 17 38 08  CMP  Roger. You've deliberately loaded in a bigger number, and we cut off at a plus number manually by throwing the switch down, right?

06 17 38 15  CC  That's affirmative, but it's 100 and not 10.

06 17 38 20  CMP  Right. I've got you.

06 17 38 22  CC  Also, you did get the R, P, and Y align?

06 17 38 28  CMP  Roger. I'll get that a little later. I'm right in the midst of an alignment here.

06 17 38 31  CC  Okay. Sorry to have bothered you.

06 17 38 33  CMP  No sweat. I plan to align this thing without mapping out the range, and boy, it's really wheeling around.

06 17 41 05  CC  Apollo 7, Houston. One minute LOS. When it's convenient, you can go to BLOCK on your TM.

06 17 41 16  CMP  Roger.

MILA through BERMUDA (REV 102)

06 17 52 33  CC  Apollo 7, Houston through MILA.

06 17 52 37  CMP  Roger. Houston, Apollo 7.

06 17 52 50  CMP  Bill, shortly after I left you and even while we were talking there, I ... the P51 and then do the P30 targeting - P40 and got a P52 alignment. I'd like to go through that at least one more time on a subsequent night pass, but as of right now, we're in pretty good shape on alignments.
06 17 53 10  CC  Wal, I got the word that they took a look at
the numbers over Redstone, and they looked very
favorable.

06 17 53 17  CMP  You mean the numbers on the computer?
06 17 53 18  CC  Roger.
06 17 53 20  CMP  Very good.
06 17 53 21  CC  Also, I would like to check one thing if you'll
get the maneuver PAD.
06 17 53 27  CMP  Got it right here.
06 17 53 28  CC  Roger. The trunnion - trunning is 201.
06 17 53 30  CMP  ... too, did you not?
06 17 53 32  CC  You read it back. I'm pretty sure you read it
correctly; I just wanted to confirm. It sounded
- I wasn't too sure about the first number, and
so that's about two-thirds of the way down the
PAD there, 201 for the trunnion.

06 17 54 07  CMP  Oh, yes. ... star alignments.
06 17 54 12  CC  Would you say that again, please?
06 17 54 15  CMP  ... backup alignment numbers - that was ...
06 17 54 19  CC  Oh, yes. Well, I just sent those up because
this was an important burn, and it was 171,
260, and 014 for the roll, pitch, and yaw align.
06 17 54 34  CMP  Okay. Thank you. In case ... or something,
I might have to use those at the last minute;
I don't think it will happen, but —
06 17 54 42  CC  Okay.
06 17 54 44   CMP   What I got to watch out for now is the fact we're lined up out of plane and this thing likes to fly inplane.
06 17 54 50   CC    Roger.
06 17 56 55   CC    Apollo 7, Houston. We still show you in ACCEPT.
06 17 57 01   CMP   Roger. Thank you.
06 17 57 12   CC    Also, Donn, I have a block data to read up.
You're probably coming out of nighttime now, and to keep from having to give this to you over Carnarvon - you'll be coming up on night-time pass - I'd like to get that to you as soon as possible, and then leave you free to use as much of the nighttime as possible on the next nighttime pass.
06 17 57 32   CMP   Good thinking. I'll get the block data out.
06 17 58 25   CMP   Go ahead with your block, Bill.
06 17 58 27   CC    Roger. Before I start, I'd like to verify you have loaded the DAP with the DAP data update I gave you.
06 17 58 38   CMP   That's right.
06 17 58 39   CC    Roger. Okay. Starting to read block data.
105 dash 1 Alfa plus 314 minus 0627 164 46 06 3446, 106 dash 1 Alfa plus 286 minus 0631 166 21 55 3485, 107 dash 4 Alfa plus 283 minus 1625 168 59 03 3038, 108 dash 4 Alfa plus 302 minus 1625 170 40 38 2787, 109 dash 4 Alfa
plus 275 minus 1625 172 22 48 3072, 110 dash
3 Alfa plus 299 plus 1390 173 34 54 2890.
Standing by for readback.

MILA through BERMUDA (REV 103)

06 18 01 21 CMP Roger. 105 dash 1 Alfa plus 314 minus 0627
165 47 06 3446, 106 dash 1 Alfa plus 286 minus
0631 166 21 55 3485, 107 dash 1 Alfa plus 282
minus 1625 168 59 03 3038, 108 dash 1 Alfa plus
302 minus 1625 170 40 38 2787, 109 dash 1 Alfa
plus 275 minus 1625 172 22 48 3072, 110 dash 3
Alfa plus 299 plus 1390 173 34 54 2890.

06 18 02 26 CC Roger. Readback correct. Coming up on LOS;
we'll have Canaries at 05.

CANARY (REV 103)

06 18 05 53 CC Apollo 7, Houston through Canary.
06 18 05 57 CMP Roger.
06 18 06 50 CC Donn, you might be interested: the S-IVB is
just a bit ahead of you at about 400K, on the
east coast Africa.

06 18 07 02 CMP Oh, yea?
06 18 07 04 CC It's coming in.
06 18 07 07 CMP Oh, it's coming in? Adios, big moose.
06 18 07 31 CMP Houston, Apollo 7.
06 18 07 33 CC Go.
06 18 07 36 CMP I think you need to give us a little advice
along the way on these RCS quads. I'm going
to switch them. I've already switched C, and
I suspect A is getting down in that direction,
perhaps B and D also.
Roger. Stand by.
I don't want to switch them until we have to,
but I'd like you to help out.
Okay.
Apollo 7, Houston. You're riding comfortable
above on Bravo and Delta. You're getting fairly
close to A, about 5 to 6 pounds above, and we'll
keep you advised on that just like we did on
Charlie quad.
Roger. Thank you.
Roger. And you might check attitude again there.
Roger. It's getting close.
Roger.
I'll try not to fire any thrusters.
Apollo 7, Houston. We're about 1 minute and a
half here until LOG, and we're transmitting
through S-band. How do you read?
I read you fine, Bill.
Okay. Good. Thank you.
Houston, Apollo 7.
Go.
Roger. Bill, could you find out exactly how
many frames we have in this big set camera
pack? Nominal number is something like 165.
We appear to have more than that. I just wondered if anybody down there knows exactly how many.

I'll check. I'll try and get the word to you, but we're coming up on LOS.

Well, whatever is convenient; no rush on it.

We're checking.

Apollo 7, Houston. We'll have Carnarvon at 40.

CARNARVON (REV 103)

Apollo 7, Houston through Carnarvon.

Roger. Houston, this is Apollo 7.

Roger. Say, in reference to the passive thermal control test: we would still like to perform the test as per the procedure. A couple of points of clarification: the time of initiation is selected to get MAX time above 200 miles with channels disabled; also, the time to initiate attitude hold is 10 minutes past perigee so we shouldn't have too much of a problem there on the drag.

Okay. If you say so. We'll give it a whirl; if it's too bad, we'll probably have to modify a little bit going up.

Okay. And in that regard, there'll be two more of those tests, and they say if this is too expensive in fuel that we can just take a look
at one of the two other tests that are coming up. We may just scrub one of those.

But I'd strongly suggest that if we get good results out of the first one.

Well, they don't anticipate too much of a problem, but we'll just adopt a wait-and-see attitude on that one.

Roger. Understand.

Also, in reference to your question on the cassette: I've checked into this, and there are 165 frames MAX in there, and I asked them if you kept cranking what happened. Apparently, it just keeps turning, so you're not taking any more pictures after that.

Oh, no, you've got to be kidding. Okay. Thank you for the dope.

Right. Also, just for your information, on your pass over the States after the burn, you will be visible over Houston.

Roger. Understand.

Just before sunrise.

I'm sorry, Donn; that's before the burn.

Roger. Understand.

Say, Donn, how did the EMS DELTA-V test work out?

We haven't done that yet, Bill.
06 18 43 27  CC  Okay.
06 18 43 30  CMP  Houston, Apollo 7.
06 18 43 32  CC  Roger. Go.
06 18 43 34  CMP  Roger. Just got a picture of Carnarvon.
06 18 44 36  CC  Good.
06 18 44 50  CC  Apollo 7, Houston. O2 tanks 2 fans ON 3 minutes, then OFF.
06 18 46 12  CC  Apollo 7, Houston. Did you copy me on the O2 tank 2 fans?
06 18 46 20  CMP  Roger, Bill.
06 18 46 22  CC  Okay. And in about 2 minutes, we'll have 103 Carnarvon, and we'll require 8-band volume up for Honeysuckle.
06 18 46 30  CMP  Roger. Understand, Bill. And we just took three pictures, frame 3, 4, and 5 on magazine R of Shark's Bay, Carnarvon, and a terrain feature in Australia.
06 18 46 42  CC  Okay.
06 18 46 42  HONEYSUCKLE (REY 103)
06 18 49 24  CC  Apollo 7, Houston.
06 18 49 40  CC  Apollo 7, Houston.
06 18 49 49  CC  Roger. I've just been advised we're monitoring your condenser temperature on fuel cell number 2 at 176.4 degrees. This is 10 degrees higher than the other; there is a limit of 176 for alarm indication so you may get a light on that, but we are
watching it, and there is no cause for undue concern now.

06 18 50 15 CMP Roger. You say if it goes up to 176 not to sweat it.

06 18 50 18 CC Roger. You get a light.

06 18 50 20 CMP Right. I know; but we don't have to get excited about that?

06 18 50 23 CC Roger.

06 18 50 24 CMP Okay.

06 18 55 32 CC Apollo 7, Houston. One minute LOS Honeysuckle; Guaymas at 20.

06 18 55 40 CMP Roger.

GUAYMAS through ANTIGUA (REV 103)

06 19 20 57 CC Apollo 7, Houston through Guaymas.

06 19 21 00 IMP Roger, Houston. Good morning, Bill.

06 19 21 03 CC Good morning; how are you today?

06 19 21 05 IMP Not bad. Say, I wonder if you could give me a readout on my fuel cell radiator 2 inlet and outlet test, please. Give me the trend for the last several hours.

06 19 21 15 CC Roger. We're doing that very thing right now.

06 19 21 21 IMP We do have a partial warning light on, and it's reading about 177 or 178 on the condenser exhaust; the skip temperature has crept on up to about 435.

06 19 21 34 CC Roger. Our last reading on the fuel cell was 174, and that was at 48 over Carnarvon.
Roger. I'm wondering about - if we get that trend, I'm sure you think it's probably a cooler pump failure, also. The other question I have is should we give some thought to open circuiting the fuel cell now and throwing it on, letting it cool down a bit, putting it on just before the burn?

That's exactly our line of thinking; we'll get back to you on that just as soon as we take a closer look at the data here.

Okay.

GUAYMAS through ANTIGUA (REV 104)

Apollo 7, Houston.

Go ahead, Bill.

Go ahead, Bill.

Roger. In regard to your first request, we're still working on the trend. I told them to go back about two orbits. We suggest you open circuit the fuel cell and put it back on line at 16½ plus ½. That's 15 minutes prior to the burn. Two fuel cells can handle the loads; however, the bus voltage is going to be about 26.5 to 26.6.

Roger. I concur. Say again the time for putting them back on.

At 16½ plus ½; that's 15 minutes prior to the burn.

Right.
06 19 27 18  IMP  Got a morning report for you, Bill.
06 19 27 21  CC   Okay.
06 19 27 22  IMP  Partial pressure O₂ still 245 mm of mercury, so it looks like it's holding there. I'll knock off giving you those readings any more; I might take one the last morning. IMP 15 clicks of water this morning. I had 6 and 1/2 hours, maybe 7 hours of sleep. CDR had 4 and 1/2 hours of good sleep last night.
06 19 27 50  CC   Roger. Understand. IMP 15 clicks of water, 6 and 1/2 to 7 hours of sleep, and the CDR 4 and 1/2 hours of good sleep. Also, Walt, you can turn the CRYO O₂ tanks - tank fans off, tank 2 fans off.
06 19 28 08  IMP  They're off. Been off awhile.
06 19 28 10  CC   Thank you.
06 19 28 16  CDR  Good morning, Bill.
06 19 28 17  CC   Good morning, Wally. How's everything?
06 19 28 19  CDR  Very good. Haven't heard you in awhile.
06 19 28 21  CC   No, I've been on the off period here, I guess.
06 19 28 25  CDR  Yes, they're trying to move us up earlier each day.
06 19 28 28  CC   Right.
06 19 28 30  IMP  Understand you're a big TV fan of ours.
06 19 28 33  CC   That's right. I've been running home from work just in time to watch.
06 19 28 56  CDR  Thought for today we were going to try for an Emmy for the best weekly series.
06 19 29 02  CC  I thought you were going to try for a Emmy.
06 19 29 03  CDR  Emmy.
06 19 29 04  CC  Right.
06 19 29 05  CDR  Oh, you're coming back. I lost it. That's one for you.
06 19 29 10  CC  (laughing) That's a rare one.
06 19 29 41  CDR  That makes up for the involuntary "Oh, Boy" you gave us, anyway.
06 19 29 44  CC  Roger.
06 19 30 32  CC  Apollo 7, Houston. At the risk of belaboring the point, we'd like to confirm O₂ tank 2 fans OFF and heaters AUTO.
06 19 30 46  LMF  Fans are off and the - I have one heater here on. Was that called ON during the night?
06 19 30 54  CC  Negative. That should be -
06 19 30 58  LMF  Okay. The fan is off.
06 19 31 04  CC  Okay. For O₂ tank 2, the fans should be off and the heater in AUTO.
06 19 31 09  LMF  Roger. Understand. I'm going to turn the fan on for 5 minutes. I had it off here. Looks like we may have had a heater go inadvertently ON instead of AUTO.
06 19 31 22  CC  Okay.
06 19 33 06  CC  Apollo 7, Houston.
Go ahead, Bill.

Roger. You might tell Donn apparently he’s trying to load that H2N 48 there and having trouble in register 2. He’s putting in a minus 49; and when he’s checking it, it’s coming back a 50. They say that’s because of scaling into and out from.

Roger. I was having fun with that. If you put in a 49, it adds one; and if you put in a 48, it subtracts one. There’s no way to get 49 on there. They say that when you put the 49 in and enter it, it’s okay.

Yes, it’s all right.

Okay.

I was just having fun with it.

Hey, Bill, notice how quickly our condenser exhaust temperature started coming down.

Hey, Bill, it’s coming right down.

Hey, Bill, I’m thinking of manually balancing the hydrogen tanks right after the burn.

Okay.

I’d like to have what you guys read out as quantities in H₂ 1 and H₂ 2.

Stand by.

Wait, we’re reading 42.6 in number - H₂ number 1 and 39.2 in H₂ number 2.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 19 35 49</td>
<td>IMP</td>
<td>Roger. I'll balance it after the burn. Tell Rita Bapp that ham and applesauce is a great dish.</td>
</tr>
<tr>
<td>06 19 35 59</td>
<td>CC</td>
<td>Roger. Ham and applesauce. We're coming up on LOS; we'll have Canaries at 39.</td>
</tr>
<tr>
<td>06 19 36 09</td>
<td>CDR</td>
<td>As far as CDR's concerned, steak and eggs are better.</td>
</tr>
<tr>
<td>06 19 36 12</td>
<td>CC</td>
<td>Amen.</td>
</tr>
<tr>
<td>06 19 39 48</td>
<td>CC</td>
<td>Apollo 7, Houston through Canary.</td>
</tr>
<tr>
<td>06 19 39 51</td>
<td>IMP</td>
<td>Roger. Loud and clear, Bill.</td>
</tr>
<tr>
<td>06 19 39 53</td>
<td>CC</td>
<td>Roger. Have you done the EMS DELTA-V bias test yet?</td>
</tr>
<tr>
<td>06 19 39 58</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>06 19 40 00</td>
<td>CC</td>
<td>And as soon as you have finished with t'at, we would like a fuel cell O₂ purge on all three.</td>
</tr>
<tr>
<td>06 19 40 07</td>
<td>IMP</td>
<td>Roger. I'm going to go ahead and do that now.</td>
</tr>
<tr>
<td>06 19 40 11</td>
<td>CC</td>
<td>Well, we thought maybe that - no, I guess it wouldn't hurt anything.</td>
</tr>
<tr>
<td>06 19 40 17</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 19 41 00</td>
<td>CC</td>
<td>Apollo 7, Houston. I have an update for the passive thermal control tests. However, if you are busy, we can hold off for awhile.</td>
</tr>
<tr>
<td>06 19 41 09</td>
<td>IMP</td>
<td>Go ahead, Bill.</td>
</tr>
<tr>
<td>06 19 41 10</td>
<td>CC</td>
<td>Roger. Passive thermal control, T zero 166 plus 50, T align 167 plus 16, attitude is 000. And that's it.</td>
</tr>
<tr>
<td>Time</td>
<td>Call</td>
<td>Text</td>
</tr>
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<td>-------</td>
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<td>------</td>
</tr>
<tr>
<td>06 19 41 35</td>
<td>LMP</td>
<td>Roger. T zero 166 050, T align 167 plus 16, roll zero, pitch zero, yaw zero.</td>
</tr>
<tr>
<td>06 19 41 42</td>
<td>CC</td>
<td>Readback is correct.</td>
</tr>
<tr>
<td>06 19 41 46</td>
<td>CDR</td>
<td>Bill, did anybody take into consideration our perigee torquing on that alignment?</td>
</tr>
<tr>
<td>06 19 41 53</td>
<td>CC</td>
<td>Yes, we had quite a discussion on that, Wally. And it turns out that - you spin this thing up about 10 minutes past perigee and go in attitude hold. They're willing to pay any penalty to get that thing set up for this so that you will be in the proper attitude at the proper roll rate as you go above 200 miles. If they use too much fuel on this, then they are willing to do away with one of the - or both of the other tests.</td>
</tr>
<tr>
<td>06 19 42 22</td>
<td>CDR</td>
<td>Okay. Let's have all of the DTO guys get together in a huddle and add up their willingness to spend fuel and see if it meets our budget.</td>
</tr>
<tr>
<td>06 19 42 33</td>
<td>CC</td>
<td>Roger. Well, that's what we have already done, and they say they are willing to accept a cancellation of one or both of those later tests in order to get this done the way it is written out.</td>
</tr>
<tr>
<td>06 19 42 45</td>
<td>CDR</td>
<td>Okay. That's fair enough. I think we all - it's a new thing to all of us up here, and I think we should be aware of it.</td>
</tr>
<tr>
<td>06 19 42 53</td>
<td>CC</td>
<td>Roger.</td>
</tr>
</tbody>
</table>
06 19 42 54  CDR  I'm not complaining or anything there. It's a phenomenon that's going to hurt us every time. I'm explaining it right now, in fact.

06 19 42 59  CC  Roger.

06 19 43 00  CDR  I think I got advantage of it this time. It is driving me to the right attitude.

06 19 43 06  CC  Good.

06 19 45 57  CC  Apollo 7, Houston. Coming up on LOS Canary. We may be able to get you at Tananarive at 01. Also, we would like the BIOMED to CDR, and note we have lost CMP ENG; request check harness.

06 19 46 19  LMP  Lost CMP ENG. Roger. You notice that my main bus voltage, Bill, is running right at 26 volts down here; it's going to trigger these lights on and off.

06 19 46 30  CC  Roger. I just checked on that a minute ago, and we were reading 26.9. Let me check again, here. 26.7 to 26.6 we're reading here, Walt.

06 19 46 42  LMP  Okay. Well, it triggered off the master alarm a little bit ago, and I'm reading right at 26 on the onboard meter.

06 19 46 47  CC  Thank you very much.

06 19 47 03  CDR  Bill, what about the change of coolant pump?

TANANARIVE (REV 104)

06 20 03 41  CC  Apollo 7, Apollo 7 through Tananarive. Over.

CARNARVON (REV 104)

06 20 14 26  CC  Apollo 7, Houston through Carnarvon.
Roger. Loud and clear. The EMS bias test for the duration of the burn plus 30 seconds, which is when we turn it on, is 0.3 feet per second.

Roger. 0.3.

That's a minute and 36 seconds.

Bill, I would like to have you go over again what you have proposed for the DELTA-V counter setting on this burn.

Okay. The DELTA-V counter setting will be 1728.0. What this does - it is 100 feet higher than the DELTA-V that you want to get, and you will turn the thrust switches off at 100.0 indication on the DELTA-V₃ counter, in other words, with a hundred feet remaining.

What is the reasoning behind that? The thing is built to turn itself off at zero. That's one of our primary checks on the SCS cutoff on the DELTA-V counter.

I'll turn it off if it doesn't turn itself off at zero. This is a complete departure from the way we normally use the DELTA-V counter and the SCS technique.

Roger. That is correct. However, the DTO calls for this as part of the test. I think it's in that little burn sheet on the inside cover of the flight plan.
06 20 16 10  CDR  The DTO is wrong, then.
06 20 16 19  CDR  The DELTA-V cutoff in the DTO, as I see it -
we've looked at it - says cutoff through thrust
switches. I don't think enough people understand
the EMS. I found that out as soon as we got it
on board.

06 20 16 40  CC  Wait, are you there?
06 20 16 45  LMP  I'm here.
06 20 16 49  CC  Roger. We need fuel cell number 2 back ON at
164 plus 30. That's 30 minutes prior to the
burn, instead of the 15 that I gave you.

06 20 16 57  LMP  Okay. I'll do that, but it looks to me like
it's going to - that will give us just about
enough time to get up the alarm stage again.

06 20 17 11  CC  Down is still reading 170 about on the condenser
exhaust and 430 on the skin.

06 20 17 14  LMP  Let me see if I can get a compromise here.
06 20 17 25  CC  Okay. I'll do - I'll go with whatever you guys
want, but I would like to make sure we aren't
jumping the gun. Also, I would like to know
what your trim data shows on those radiators,
so I will know whether to turn the pumps off
or not.

06 20 17 30  LMP  Roger. Stand by. I've asked for that. It's
still in process.
06 20 17 30  LMP  Okay. Standing by.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 20 17 52</td>
<td>CDR</td>
<td>Bill, you do understand the normal cutoff at a DELTA-V? That's what it's for. It will beat me any time.</td>
</tr>
<tr>
<td>06 20 17 58</td>
<td>CC</td>
<td>Roger. I understand that. In fact, the way I had understood this was that you were using the thrust switches to turn it OFF just to check them. It's part of a --</td>
</tr>
<tr>
<td>06 20 18 07</td>
<td>CDR</td>
<td>They better work; that's all we've got. They got three modes of cutoffs: G&amp;H cutoff, DELTA-V counter going through zero, and then DELTA-V thrust switches. And I'm convinced that they must work, or I wouldn't be up here.</td>
</tr>
<tr>
<td>06 20 18 23</td>
<td>CC</td>
<td>Right. This was a late change, Wally, and you have a 100 foot per second there to play with, so to speak. If they don't cut it off, then the DELTA-V will cut it off.</td>
</tr>
<tr>
<td>06 20 18 34</td>
<td>CDR</td>
<td>Roger. That's a late change to everything then; that is not the way we've been doing burn 5. And it says nothing about biasing the DELTA-V counter 100 feet per second. We've never done it. I'm hair-triggered for zero.</td>
</tr>
<tr>
<td>06 20 19 25</td>
<td>CDR</td>
<td>Hey, Bill.</td>
</tr>
<tr>
<td>06 20 19 26</td>
<td>CC</td>
<td>Go.</td>
</tr>
<tr>
<td>06 20 19 28</td>
<td>CDR</td>
<td>I guess you have raised something in my mind. We did have an SCS burn where the DELTA-V counter did cut off, didn't we?</td>
</tr>
<tr>
<td>06 20 19 34</td>
<td>CC</td>
<td>Roger. That is affirmative.</td>
</tr>
</tbody>
</table>
Okay. Let's bias it about, say 50 feet. I don't want to throw another 100 feet per second on this beauty.

Wally, 50 feet bias - feet per second bias is okay.

Okay.

Apollo 7, Houston. One minute LOS Carmanvon; Honeysuckle at 22; 5-band volume up.

Apollo 7, Houston. You might check the fans, might still be ON, O₂ tank 2.

HONEYSUCKLE (REV 104)

Apollo 7, Houston through Honeysuckle.

Loud and clear.

Roger. Did you get my call to check the O₂ tank 2 fans? We are monitoring them still ON.

I did, and I think you'll find them OFF now.

Roger.

Apollo 7, Houston. Subsequent to our conversation on this DELTA-V setting, I just want to confirm that the setting will now be 1678.8.

Roger. We'll set it now.

Thank you.

Apollo 7, Houston. A few minutes ago, you gave me the drift for the EMS DELTA-V bias test as 0.3 and 1 plus 36 seconds. I just wonder if I could get a readout of residuals from the EMS DELTA-V test.
Apollo 7, Houston.

The fuel cell condenser - looking at the condenser exhaust temperature of fuel cell 1 now, and the skin temperature, also.

But I do have fuel cell 2 back on the lines.

Roger. Thank you.

Apollo 7, Houston. Request a readout on the residuals from the EMS DELTA-V test.

I ran the EMS DELTA - DELTA-V test is minus 21.7.

21.7. Thank you.

Hey, Bill, fuel cell 1 has got a skin temperature of about - between 435 and 440, and the condenser exhaust temperature is 178, it looks like now.

Roger. We are reading slightly lower than that, but we are watching it.

Okay. It seems to start coming down after I put two on the line, but I can't figure it out in regard to condenser exhaust temperature.

We are studying the problem, too.

Okay. We show number 1 coming, starting to come down slightly. We're about 1 minute from LOS Honeysuckle; Guaymas at 51 - excuse me, Huntsville at 47.
<table>
<thead>
<tr>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>06 20 48 24</td>
<td>CC</td>
<td>Apollo 7, Houston through Huntsville.</td>
</tr>
<tr>
<td>06 20 50 23</td>
<td>CDR</td>
<td>Houston, do you read?</td>
</tr>
<tr>
<td>06 20 50 25</td>
<td>CC</td>
<td>Apollo 7, Houston. Go.</td>
</tr>
<tr>
<td>06 20 50 27</td>
<td>LMP</td>
<td>Roger. Bill, I just wanted to report the sextant star check was within a couple of tenths of a degree: very good.</td>
</tr>
<tr>
<td>06 20 50 34</td>
<td>CC</td>
<td>Roger. Within two-tenths of a degree. Thank you.</td>
</tr>
<tr>
<td>06 20 50 36</td>
<td>LMP</td>
<td>Right.</td>
</tr>
<tr>
<td>06 20 50 39</td>
<td>CC</td>
<td>You have about 1 minute and —</td>
</tr>
<tr>
<td>06 20 50 40</td>
<td>LMP</td>
<td>On the alignment — this was a couple of hours ago — on the initial alignment, the gyro torquing angles were 1 degree, 2 degrees, and 3 and 1/2 degrees, respectively.</td>
</tr>
<tr>
<td>06 20 50 51</td>
<td>CC</td>
<td>Roger. One degree, 2 degrees, and 3 and 1/2 degrees.</td>
</tr>
<tr>
<td>06 20 50 55</td>
<td>LMP</td>
<td>Right. That was after the coarse align to the burn attitude. And at the fine align, torque angles were very small.</td>
</tr>
<tr>
<td>06 20 51 01</td>
<td>CC</td>
<td>Roger. Fine align very small. I have an advisory regarding the burn, relating to the fuel cell operation. Number 1: make the burn with three fuel cells on line, of course, if at all possible. Number 2: it's okay to make the burn with two fuel cells; it would cost less than 1 ampere hour on the batteries. Number 3: if the...</td>
</tr>
</tbody>
</table>
condenser temperature exceeds 200 degrees F, remove that fuel cell from line except during the burn.

06 20 51 42 LMP Roger.
06 20 51 49 CC Wait, how are the fuel cells looking now?
06 20 51 57 CDR Roger that.
06 20 53 06 CT Huntsville LOS.

GUAYMAS through ANTIGUA (REV 104)

06 20 53 49 CC Apollo 7, Houston through Guaymas.
06 20 53 49 CDR Roger. On Guaymas.
06 20 54 12 CC Apollo 7, Houston. I'll give you a time check at 5 minutes.

06 20 54 16 CDR Roger.
06 20 54 45 CC Fifteen seconds.
06 20 54 48 LMP All SCS circuit breakers CLOSED.
06 20 54 50 CDR CLOSED.
06 20 54 51 LMP Circuit breakers for gimbal motor control, four CLOSED.

06 20 54 54 CDR One, two, three, four CLOSED.
06 20 54 56 CC Five, four, three, two, one.
06 20 55 00 CC MARK.
06 20 55 01 CC Five minutes.
06 20 55 02 CDR Roger. Right on.
06 20 55 03 LMP One roll channel ENABLED.
06 20 55 05 CDR Okay. AC OFF.
06 20 55 07 LMP Direct RCS OFF.
06 20 55 08  CDR  Direct OFF.
06 20 55 09  LMP  EMAG to RATE 2.
06 20 55 14  LMP  Spacecraft control, CMC AUTO.
06 20 55 16  CDR  CMC AUTO.
06 20 55 17  LMP  SCS TVC pulse RATE COMMAND.
06 20 55 20  CDR  RATE COMMAND.
06 20 55 24  LMP  TVC gimbal drive, pitch and yaw AUTO.
06 20 55 26  CDR  AUTO, AUTO.
06 20 55 27  LMP  TVC SERVO power, one and two ON.
06 20 55 32  CDR  One ON, two ON.
06 20 55 33  LMP  Tape controller power, one.
06 20 55 35  CDR  One.
06 20 55 36  LMP  Rotational hand controller two, ARMED.
06 20 55 39  CDR  ARMED.
06 20 55 44  LMP  MAIN bus ties are both ON; gimbal motor pitch one, yaw one.
06 20 55 48  CDR  Pitch one, START.
06 20 55 49  LMP  ON.
06 20 55 51  CDR  Yaw one, START.
06 20 55 52  LMP  ON.
06 20 55 54  LMP  Translation handcontroller, clockwise.
06 20 55 56  CDR  Clockwise.
06 20 55 57  LMP  Verified 0 MIVC.
06 20 56 00  CDR  Negative MIVC.
06 20 56 01  LMP  Pitch two, yaw two.
06 20 56 03  CDR  Pitch two, START.
06 20 56 04  LMP  ON.
06 20 56 05  CDR  Yaw two, START.
06 20 56 06  LMP  ON.
06 20 56 08  LMP  Confirm and set GTI trim.
06 20 56 11  CDR  Seven 8 and 49 minus ...
06 20 56 14  LMP  Verify MTVC.
06 20 56 19  CDR  GO.
06 20 56 20  LMP  THC NEUTRAL.
06 20 56 21  CDR  NEUTRAL.
06 20 56 23  LMP  Handcontroller power, BOTH.
06 20 56 24  CDR  BOTH.
06 20 56 25  LMP  Do your trim maneuver.
06 20 56 39  CDR  Trim maneuver GO.
06 20 56 42  LMP  Okay. Direct RCS ON.
06 20 56 45  CDR  Direct ON.
06 20 56 49  LMP  Were trimmed?
06 20 56 51  LMP  IMAG.
06 20 56 52  LMP  Manual attitude - excuse me - RATE COMMAND.
06 20 56 55  CDR  Verify.
06 20 56 56  LMP  IMAG's to rate, ATT-1/RATE 2.
06 20 56 58  CDR  Three, ATT-1/RATE 2.
06 20 57 09  LMP  ENTER.
06 20 57 11  LMP  Gimbal trims coming up.
06 20 57 13  LMP  Pitch up.
06 20 57 14  CDR  Pitch down.
06 20 57 15  CDR  Zero, zero, zero, zero.
06 20 57 24 IMP Standing by for 2 minutes.
06 20 57 28 CDR ... Okay. It looks good.
06 20 57 45 CC Apollo 7, Houston. On my mark, 2 minutes.
06 20 57 48 CDR Roger.
06 20 58 00 CC MARK.
06 20 58 01 CC Two minutes.
06 20 58 02 CDR Roger. With you.
06 20 58 04 CDR Two minutes.
06 20 58 05 LMP FDLI scale, 5/5.
06 20 58 08 CDR Five-five.
06 20 58 09 LMP DELTA-V thrust A and B, NORMAL.
06 20 58 10 CDR A NORMAL, B NORMAL.
06 20 58 15 LMP Handcontrollers ARMED.
06 20 58 19 CMP Number 1 is ARMED.
06 20 58 22 CDR Two, ...
06 20 58 24 LMP GDC align.
06 20 58 34 LMP Standing by for 30. We have plus voltage aux-

iliaries. Circuit breakers are in on 277.
Flight qual recorder going ON at 30 seconds.
06 20 58 41 CC Roger.
06 20 59 19 IMP Flight QUAL recorder going ON now.
06 20 59 27 LMP G&S to DELTA-V in AUTO.
06 20 59 30 CC Twenty seconds.
06 20 59 31 LMP Uillage in 20 seconds.
06 20 59 35 LMP DELTA-V \* counting.
06 20 59 41 CDR Uillage COMMENCE. DELTA-V counting.
06 20 59 50 CC Ten seconds.
06 20 59 51 CDR Roger.
06 20 59 55 CC Five, four, three, two, one.

GUAYMAS through ANTIGUA (REV 105)
06 21 00 00 CC Ignition.
06 21 00 01 CDR Starting.
06 21 00 04 IMP Four balls out.
06 21 00 06 CDR Yabedabado!
06 21 01 28 LMP DELTA-V thrusters A and B, OFF.
06 21 01 30 CDR They're OFF.
06 21 01 35 LMP Gimbal motors are OFF; gimbal motor control cir-
cuit breakers are OPEN.
06 21 01 37 CDR OPEN.
06 21 01 38 LMP TVC power 1 and 2, OFF.
06 21 01 40 CDR OFF.
06 21 01 41 LMP Direct RCS, OFF.
06 21 01 42 CDR Direct OFF.
06 21 01 43 LMP Main bus ties are OFF.
06 21 01 45 LMP Flight QUAL recorder.
06 21 01 46 CMP Flight QUAL is OFF. That's it.
06 21 02 04 CDR Houston, Apollo 7.
06 21 02 06 IMP Roger. Our residuals are minus two balls 469
plus 00128 plus 0079; the DELTA-V counter is
hardly visible due to the bright sunlight in
the cabin at this time, even with the numerics
still up, so we're having it cut off itself.
<table>
<thead>
<tr>
<th>Time</th>
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<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 21 02 26</td>
<td>CC</td>
<td>Roger. Understand. It cut off on the DELTA-V counter.</td>
</tr>
<tr>
<td>06 21 02 31</td>
<td>IMP</td>
<td>That's right.</td>
</tr>
<tr>
<td>06 21 02 32</td>
<td>CC</td>
<td>Thank you.</td>
</tr>
<tr>
<td>06 21 02 55</td>
<td>IMP</td>
<td>I'm reading 4.55 percent oxidizer left, and 3.8 percent fuel left on the SPS.</td>
</tr>
<tr>
<td>06 21 03 05</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 21 03 06</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>06 21 03 07</td>
<td>CC</td>
<td>Go.</td>
</tr>
<tr>
<td>06 21 03 08</td>
<td>CDR</td>
<td>That's your big mistake in changing the rules in real time. First off, we couldn't see the DELTA-V counter.</td>
</tr>
<tr>
<td>06 21 03 16</td>
<td>IMP</td>
<td>Yes —</td>
</tr>
<tr>
<td>06 21 03 17</td>
<td>CC</td>
<td>Roger. We read that; I think that the situation is rather obvious now.</td>
</tr>
<tr>
<td>06 21 03 20</td>
<td>CDR</td>
<td>Okay. Let's then learn a big lesson from that.</td>
</tr>
<tr>
<td>06 21 03 29</td>
<td>CDR</td>
<td>If you recall, we simulated that burn without doing that DELTA-V game.</td>
</tr>
<tr>
<td>06 21 03 34</td>
<td>CC</td>
<td>Roger. That was a last minute change.</td>
</tr>
<tr>
<td>06 21 03 36</td>
<td>CDR</td>
<td>That's correct; it didn't hurt us.</td>
</tr>
<tr>
<td>06 21 03 41</td>
<td>CDR</td>
<td>That's the reason we went along with it.</td>
</tr>
<tr>
<td>06 21 03 47</td>
<td>CDR</td>
<td>The DELTA-V counter residuals is minus 17.5.</td>
</tr>
<tr>
<td>06 21 03 57</td>
<td>CC</td>
<td>Apollo 7, Houston. We have you in an 89 by 243.</td>
</tr>
<tr>
<td>06 21 04 02</td>
<td>IMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 21 04 03</td>
<td>CDR</td>
<td>Roger. I had a chance to look at the accelerometer; it was just a smidgen under 1 g.</td>
</tr>
</tbody>
</table>
06 21 04 08  CC  Roger.
06 21 04 09  CDR  Which was a nice little experience for this
       long a period.
06 21 04 12  CC  Right.
06 21 04 17  CDR  It didn't even twitch a little bit when we took
       over a real nice transition into SCS MPDC.
06 21 04 25  CC  Roger. Copy.
06 21 04 26  CDR  It took very minute control adjustments to
       keep it on.
06 21 04 33  CC  Roger.
06 21 05 41  CDR  Houston, Apollo 7.
06 21 05 43  CC  Go.
06 21 05 46  CC  Apollo 7, Houston. Go.
06 21 05 48  CDR  Houston, Apollo 7.
06 21 05 49  CC  Apollo 7, Houston. How do you read?
06 21 05 57  CC  Apollo 7, Houston. How do you read?
06 21 06 12  CC  Apollo 7, Apollo 7. Over.
06 21 06 21  CC  Apollo 7, Apollo 7. How do you read? Over.
06 21 06 25  CDR  Roger. Read you loud and clear.
06 21 06 27  CC  Roger. We had to go to manual key.
06 21 06 30  CDR  That was a real nice maneuver. The machine
       performed beautifully.
06 21 06 34  CC  Good.
06 21 06 35  CDR  ... completed either one.
06 21 06 36  CC  Nice to hear.
06 21 06 42  CDR  We may be mopping up water; we'll check that
       a little later.
Roger. That ought to have settled quite a bit out.

We are realigning to the DSKY ALIGN.

Roger.

Apollo 7, Apollo 7. One minute to LOS; Canaries at 1k. Over.

Roger, Houston through Canary.

Roger. Hey, Bill, we've had our primary evaporator shut down for - coming on to about 36 hours, I guess, or 30 hours. How often am I going to have to reservice that? It's going to be susceptible to drying out just like the secondary, isn't it?

Stand by.

Apollo 7, Houston. Recommend leave primary evaporator as is. We will open up back pressure valve prior to 48 hours elapsed, and ground is not particularly worried about that.

Thank you. I'm glad they are not.

That's very reassuring.

If you read, rock your tower, will you?

Roger.

Hey, Bill, how come you let the third team stay on for the big burn?

Well, we had to have some practice.
06 21 16 46  CDR  Yes, you'll have something to say in your press conference today.
06 21 16 50  CC  What's this?
06 21 16 54  CDR  Aren't you having those duty press conferences when you break up?
06 21 16 59  CC  Oh, I've been working the graveyard shift. I haven't had any of those.
06 21 17 04  CDR  Oh, the press corps goes to bed when you're working?
06 21 17 06  CC  Right. Donn and I have been having conversations.
06 21 17 10  CDR  Bill, we've been getting briefed during the day.
06 21 17 53  CC  Apollo 7, Houston. One minute LOS Canary; Tananarive at 31.
06 21 17 59  CDR  Roger.
06 21 18 08  CDR  Our residuals are exactly 50 feet per second.
06 21 18 14  CC  Say again, Wally.
06 21 18 16  CDR  I said our residuals are exactly 50 feet per second.
06 21 18 19  CC  Roger. Copy that.
06 21 32 50  CC  Apollo 7, Houston through Tananarive.
06 21 32 55  CDR  Put down a plot ... lake ... and Lake Victoria, frame 11, magazine R as in Romeo.
06 21 33 04  CC  Roger. Wally, just one thing on T align for this passive thermo control test: if you set
in the T align that we have given you prior to
166 plus 50, you'll have to do it over again.

I'm sorry; that's 165 plus 50.

Starting out real nice down there today.

Houston, Apollo 7.

Go ahead, 7.

May I have the coordinates for the station at
Tananarive? I'll try to get a picture of it.

Roger. Stand by.

Apollo 7, Houston.

Go ahead.

Donn, if you set in the T align that we gave
you for this passive thermo control test prior
to 166 plus 50, you'll have to redo it again.

We understand that. That's why we had it up
there originally.

Okay. Real fine.

Yes, that's two for today. We've really got
it in.

Jack, why do I have to do it over, offhand?

Is it that far in error, or did you say you
were going to fine tune it?

Well, what it does, you'll be over - one rev
ahead on the integration there.

Houston, Apollo 7. Over.

Hey, Jack, are you still there?
Roger, Walt.

Are you familiar with our fuel pump problem?

Fuel pump 2? We got fuel pump 2 back on the line. Do you want me to leave it on until the condenser is off – temperature hits 200 and starts cycling back and forth between 200 on condenser exhaust and 380 on skin temp? Or just save it for when I need it? I'd just as soon leave it on the line, unless somebody else has strong druthers.

Okay. Walt, we would like to leave fuel cell on the line to see if $T_{CG}$ goes on up toward 200 again.

... again, and if it's okay with you, I'll just leave it at 200 and cycle back and forth as per our cycling procedures.

Affirmative, Walt.

Houston, are you still there?

You still there, Jack?

Apollo 7, Houston. Go ahead.

Roger. We have a large puddle of water on the aft bulkhead after our last burn; looks like it's probably a good pint. We've marked the perimeter of the puddle on the aft bulkhead, and somebody can calculate how much water was in there.
06 21 26 58  CC  Roger. Understand.
06 21 37 01  IAP  There is a kind of meniscus effect. This water sort of bunches up off the floor.
06 21 37 16  IAP  We also had water coming out of the water gun during the day, but not a lot.
06 21 37 21  CC  Okay. Copy that.
06 21 37 24  CDR  It's coming out in big drops.
06 21 37 30  CDR  Have you been briefed on the problem we had on the fuel panel's number 5 burn with the 50 feet per second added?
06 21 37 42  CC  Okay. Wally, the COMM here at Tananarive isn't too good. We'll pick you up over Carnarvon, and let's get a good rundown on it then at 165 plus 47.
06 21 37 55  CDR  Okay.
06 21 38 18  CDR  Getting to see ...
06 21 39 03  CDR  At 165 hours 39 minutes, the water gun's putting out more gas than water at this point.
06 21 39 19  CC  Roger. Copy that, Wally. We're just about to lose you over Tananarive. Pick you up over Carnarvon.
06 21 39 25  CDR  You copying our perigee torque here?

CARNARVON (REV 105)

06 21 49 34  CC  Apollo 7, Houston through Carnarvon.
06 21 49 38  CDR  Roger. I prepared your torque start on this one with the thrust on the perigee about 230 degrees
local, pitch down 30 degrees, went right on down through 270; and as we climbed to a high apogee, there was not enough Q there to affect us, so we did a nice sweet loop right through apogee - Roger. Copy that.

... through 90 degrees local vertical.
Roger. Copy that.
The remark I tried to make at Tananarive is let's not make changes in the system at the last minute. That's how I got a sweet little 50 feet per second overburn on that burn 5.
Roger. Copy, Wally.
I thought we learned that a long time ago. It would have been 100 feet per second if I hadn't cut it down to 50. Our problem was the sun hit right on the DELTA-V counter, and the burn switch was up full bright; and that was not sufficient to keep it illuminated.
Okay. Understand.
Now we did do burn 5 with MCC in the past.
Okay. Wally, on the fuel cell: we have been plotting RAD IN and RAD OUT temperatures, and it looks like we got a good DELTA-T, so it appears right now that the coolant pump is working.
Good news.
Except what is the problem then?
Wally, we are really looking at the data here, and we are going to let you know as soon as we get some time history on the data after Carnarvon here.

I think we're going to have a new page in that malfunction book.

What we would like to do is see if the condenser exhaust temperature will stabilize. That's why we would like you to let it go to 200.

Got it.

We can't possibly have an internal problem, Jack. One of the things that surprised me was when I took fuel cell 2 off, fuel cell 1 then started to climb in condenser exhaust and skin temp and at a greater rate than fuel cell 3, although both of them were picking up the same amount of added load. Fuel cell 3 held everything right in there; its controls seem to be a lot better than fuel cell 1. And as soon as I put fuel cell 2 back on the line to pick up its share of the load, fuel cell 1 came back on down again.

Roger. We saw all that, Walt. We are looking right now at something in the regenerator there.

Roger. Sounds about right.

And, Apollo 7. —

... To cut the 0.3 degree per second in pitch, and we will start looking for inertial.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
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<tbody>
<tr>
<td>06 21 52 27</td>
<td>CC</td>
<td>Roger. Now, Wally, we showed --</td>
</tr>
<tr>
<td>06 21 52 30</td>
<td>CDR</td>
<td>That’s close to it, I figure.</td>
</tr>
<tr>
<td>06 21 52 33</td>
<td>CC</td>
<td>We would like you to switch quad Bravo to secondary tanks now.</td>
</tr>
<tr>
<td>06 21 52 40</td>
<td>CDR</td>
<td>Roger. Bravo secondary ON, Bravo primary OFF.</td>
</tr>
<tr>
<td>06 21 52 49</td>
<td>CC</td>
<td>Copy that.</td>
</tr>
<tr>
<td>06 21 52 53</td>
<td>CDR</td>
<td>You must know something we don’t on that one. Oh, you’re reading that, aren’t you?</td>
</tr>
<tr>
<td>06 21 52 59</td>
<td>CC</td>
<td>Roger. Wally, we used just a little bit more than we expected during the burn on quad Bravo there.</td>
</tr>
<tr>
<td>06 21 53 07</td>
<td>CDR</td>
<td>How close is the balance now?</td>
</tr>
<tr>
<td>06 21 53 10</td>
<td>CC</td>
<td>Stand by. We will have it for you.</td>
</tr>
<tr>
<td>06 21 53 12</td>
<td>CDR</td>
<td>Good.</td>
</tr>
<tr>
<td>06 21 53 21</td>
<td>CC</td>
<td>Wally, the difference between Bravo and Delta is 13 pounds.</td>
</tr>
<tr>
<td>06 21 53 27</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>06 21 54 16</td>
<td>CC</td>
<td>Wait, I have this SPS propellant thermal control PAD to give you whenever you are ready.</td>
</tr>
<tr>
<td>06 21 54 26</td>
<td>IMP</td>
<td>Wait one.</td>
</tr>
<tr>
<td>06 21 55 09</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>06 21 55 12</td>
<td>CC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>06 21 55 13</td>
<td>CDR</td>
<td>Did you notice our DSKY?</td>
</tr>
<tr>
<td>06 21 55 16</td>
<td>CC</td>
<td>Negative. I've been looking at the fuel cells. Stand by.</td>
</tr>
</tbody>
</table>
06 21 55 21  CDR  And do you notice our inertial attitude?
That's on you all.

06 21 55 37  CDR  We had free ride to 000; now, we got to go fly
back again.

06 21 55 43  CC  Roger. Copy.

06 21 56 36  CDR  Hey, Jack.

06 21 56 38  CC  Go ahead.

06 21 56 42  CDR  Do you have the SPS propellant thermal control
update?

06 21 56 45  CC  Roger. Your T zero is 167 plus 57, roll 004,
pitch 183, yaw 020.

06 21 57 09  CDR  Is our T align required on this one?

06 21 57 13  CC  Negative, Wally.

06 21 57 09  CDR  Roger.

06 21 57 51  CC  Apollo 7, we are 1 minute LOS Carnarvon; we
pick you up Honeysuckle. You want to turn
your S-band volume up.

06 21 58 00  CDR  Okay. What time do you pick them up, Jack?

06 21 58 03  CC  We've got continuous coverage now. We are
really high; we've got wide overlapping cover-
age.

06 21 58 08  CDR  Very good.

06 21 59 31  CC  Apollo 7, Houston. Opposite omni.

06 21 59 38  CDR  Copy. But you sure have a lot of grass in the
background. I'm keeping the volume down.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 21 59 44</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>06 22 00 57</td>
<td>CDR</td>
<td>Apollo 7.</td>
</tr>
<tr>
<td>06 22 00 59</td>
<td>CC</td>
<td>Go ahead, 7.</td>
</tr>
<tr>
<td>06 22 01 01</td>
<td>CDR</td>
<td>Would you check to see if with the Maurer movie camera, 18mm lens, at ... frames per second, whether we overlapped on frame exposure? Over.</td>
</tr>
<tr>
<td>06 22 01 18</td>
<td>CC</td>
<td>Okay. Wally, we have a real garbled signal here at Honeysuckle. I'd like to wait and get you through Hawaii. We pick up Hawaii at 166 plus 15.</td>
</tr>
<tr>
<td>06 22 01 30</td>
<td>CDR</td>
<td>Okay. The subject is the movie camera.</td>
</tr>
<tr>
<td>06 22 01 35</td>
<td>CC</td>
<td>Okay. I copied something about the movie camera, but I didn't get it all.</td>
</tr>
<tr>
<td>06 22 01 39</td>
<td>CDR</td>
<td>Okay. I'll wait.</td>
</tr>
<tr>
<td>06 22 01 40</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>HAWAII THROUGH ANTIGUA (REV 105)</strong></td>
</tr>
<tr>
<td>06 22 15 43</td>
<td>CC</td>
<td>Apollo 7, Houston through Hawaii.</td>
</tr>
<tr>
<td>06 22 15 46</td>
<td>CDR</td>
<td>Roger. I've stopped losing at playing the game with this deal on. Let's get a good mark on the perigee torquing.</td>
</tr>
<tr>
<td>06 22 15 56</td>
<td>CDR</td>
<td>The whole thing's going to be automatic power as far as I'm concerned so that fuels on the ground test, and let's get some data on how fast it goes up at this high velocity at perigee.</td>
</tr>
<tr>
<td>06 22 16 07</td>
<td>CC</td>
<td>Okay. Real fine, Wally.</td>
</tr>
</tbody>
</table>
06 22 16 10  CDR  As I see it, perigee is at about 43 - just 7 minutes before the start of the test.
06 22 16 18  CC  Okay. Copy that.
06 22 16 28  CDR  You might get prepared for fuel usage on this, too; I'd like to find out if this might be a setup you'd have just prior to a burn for some later mission.
06 22 16 37  CC  Okay. We'll get a real good hack on it as you go through.
06 22 16 40  CDR  Very good.
06 22 16 43  CC  And I'm ready - what were you asking me about on the movie camera?
06 22 16 48  CDR  Oh, yes. I'm going to try to do some strip mapping. We did some in the States the other day when the hurricane was coming through.
06 22 16 55  CC  Roger.
06 22 16 57  CDR  And we shot at one frame a second with an 18mm lens, and I'm not sure whether we have overlap or not. Could you check on that?
06 22 17 06  CC  Okay. Will do.
06 22 17 07  CDR  And - we may need to use six frames a second, but, if so, we can handle that, too.
06 22 17 11  CC  Okay.
06 22 19 37  IMP  Houston, Apollo 7.
06 22 19 39  CC  Go ahead, Walt.
06 22 19 40  IMP  What about a map update when you get a chance, Jack?
In work.
Okay. Walt, ready on your map update.
Go.
Okay. For REV 106, the time of the node is
167 plus 42 plus 37, longitude 157.3 degrees
east.
Say the time again, please.
Roger. 167 plus 42 plus 37.
Roger. Thank you.
And I have the morning news if you would
like to hear it.
I'm ready to copy.
We have the Xerox machine working.
Roger. Jackie Kennedy and Aristotle Onassis
are to be married soon. She and her children
left New York last night to join him at his
home in Greece. He's one of the world's
wealthier men, 62 years old, she's 39. We
saw --
That's Greek to me.
Roger. We saw the spacecraft loud and clear
this morning from Houston.
Oh, great.
Very good.
And from the avalanche of cards and letters
that Penny's gotten, everybody must have seen your sign.

Oh, no.

Hope somebody's reading them.

We were trying for a - you can tell this on Bill Parker, he came back too fast - referring to a weekly series Emmy award, and he said "Emmy award." It was broken today.

They'll understand; they were going to throw us in the category of specials.

Roger. And Gladys is supposed to come onshore today near Tampa, early tomorrow. Winds are down to about 65 miles per hour; weather bureau calls it a minimal storm.

That's fortunate.

And the US won its sixth gold medal in track yesterday by winning the high hurdles.

Houston, Apollo 7.

Go ahead, 7.

Roger. We lost you after the sixth gold medal report.

That's all the morning news.

Okay. I send you one - thank the boys in the back room for the pitch and yaw gimbal settings; that was great on that engine.

Roger.
06 22 24 06  CDR  Just slid right in.
06 22 25 32  LMP  Houston, Apollo 7. Are you through Honeysuckle ...
06 22 25 37  CC  Say again, Walt?
06 22 25 39  LMP  You're coming through Honeysuckle, right?
06 22 25 44  LMP  Can I confirm that that last map update that
you gave was the next ascending node coming up?
06 22 25 58  CC  Apollo 7, could you switch omni's?
06 22 26 04  LMP  Roger. Jack, could you confirm that the map
update that I have is for the next ascending
node that is coming up?
06 22 26 11  CC  Stand by.
06 22 26 15  LMP  I show 167 plus 43. Could you verify?
06 22 26 23  CC  Roger. Walt, the time of the node is 167 plus
42 plus 37; that will be for the orbit coming
up.
06 22 26 56  LMP  Okay. Jack, if you get a chance in the future,
we'd just as soon - we have the ascending node
about - -
06 22 27 14  CC  Apollo 7, Houston.
06 22 27 24  LMP  ... Two revs ahead because our chart is not as
accurate as it used to be with our change in
inclination. That way, we can have a more ac-
curate chart for a longer period of time.
06 22 27 32  CC  Okay. Walt, we just had a handover, and I didn't
get all you said, but I think the basic part of
it is you'd like a map update about every two
revs. Is that Charlie?

06 22 27 47 LMP Negative. We'd like - whenever we call for a
map update, we'd like to have it for about two
ascending nodes in the future. Over.

06 22 27 54 CC Okay. Copy that.

06 22 27 58 CDR Jack, you might tell the boys at Carnarvon we
got a good picture of them today.

06 22 28 01 CC Okay.

06 22 34 21 CDR Houston, Apollo 7.

06 22 34 24 CC Go ahead, 7.

06 22 34 25 CDR Did you get me an answer on that frame overlap?

06 22 34 28 CC It's in work.

06 22 34 29 CDR Okay. We're about ready to strip here.

06 22 34 31 CC Okay.

06 22 34 35 CDR You can play the music.

06 22 34 37 CC Roger.

HAWAII THROUGH ANTIGUA (REV 106)

06 22 35 35 CDR Houston, you have a little high cirrus today,
but generally wide open.

06 22 35 40 CC Roger. Concur.

06 22 35 44 CDR We see no thunderstorms in the Gulf, none to
the west of you. There is a band of weather,
approximately around the San Antonio area, and
another band over towards New Orleans.

06 22 35 56 CC Roger. Thank you.
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<tr>
<th>Time</th>
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<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>06 22 35 57</td>
<td>CDR</td>
<td>We are stripping at one frame per second.</td>
</tr>
<tr>
<td>06 22 37 08</td>
<td>CDR</td>
<td>Getting a good look at the hurricane, Jack.</td>
</tr>
<tr>
<td>06 22 37 12</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>06 22 37 14</td>
<td>CDR</td>
<td>She's high and wide. We are just passing the eye, got a glimpse of it.</td>
</tr>
<tr>
<td>06 22 37 23</td>
<td>IMP</td>
<td>Took a photograph of it. That was frame 13 of magazine R.</td>
</tr>
<tr>
<td>06 22 37 32</td>
<td>CC</td>
<td>Okay. Copy that, Wally.</td>
</tr>
<tr>
<td>06 22 38 17</td>
<td>CDR</td>
<td>The Cape is loud and clear. We can see all the launch pads, and it looks like she's ready for business.</td>
</tr>
<tr>
<td>06 22 38 23</td>
<td>CMP</td>
<td>We can see Saturn V on the pad.</td>
</tr>
<tr>
<td>06 22 38 26</td>
<td>CC</td>
<td>Oh, Roger.</td>
</tr>
<tr>
<td>06 22 39 06</td>
<td>CDR</td>
<td>Jack, those guys over in Helmut Kuehnel's shop should have that answer for you by now on that film overlap.</td>
</tr>
<tr>
<td>06 22 39 11</td>
<td>CC</td>
<td>Roger. Wally, I've been riding them, and they say it's coming.</td>
</tr>
<tr>
<td>06 22 39 21</td>
<td>CC</td>
<td>Okay. Wally, I've got some happiness for you.</td>
</tr>
<tr>
<td>06 22 39 24</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>06 22 39 25</td>
<td>CC</td>
<td>Okay. For your fuel chart --</td>
</tr>
<tr>
<td>06 22 39 27</td>
<td>CDR</td>
<td>Go.</td>
</tr>
<tr>
<td>06 22 39 28</td>
<td>CC</td>
<td>-- Okay. Present value on your chart should be 598. Your SGS redline 554, DAP redline 472, and the hybrid redline 236. How's that for happiness?</td>
</tr>
</tbody>
</table>
06 22 39 50  CDR  Very nice. We're up on it.
06 22 39 54  CC  And the quad balance is such that we have got
all those redlines.
06 22 40 00  LMP  Jack, does that 598 include the 60-80 pounds of
unusable?
06 22 40 09  CC  Includes the unusable.
06 22 40 10  LMP  That's a chart update?
06 22 40 12  CC  Roger. That's your chart update, Walt.
06 22 40 16  CDR  Okay. I want to see what kind of fuel we use
after this session.
06 22 40 19  CC  Okay.
06 22 40 23  CDR  We're whistling right through perigee.
06 22 40 27  LMP  Are you plotting these on your chart down
there, Jack?
06 22 40 31  CC  Yes, sir; I am.
06 22 40 33  LMP  Okay. Look at the difference between yester-
day's number 666, and a 598. Like 68 pounds.
06 22 40 42  CC  Affirmative. We are calling it here.
06 22 40 48  CDR  That's quite a big drop.
06 22 40 51  CC  I agree.
06 22 41 31  CMP  Say, Jack, this is Donn.
06 22 41 33  CC  Go ahead.
06 22 41 35  CMP  That seemed like an awful lot of fuel for no
more than we've done since yesterday. Could
you have someone run through their data down
there and see if they can ascertain just when
and in what condition we used up all the fuel?
Okay. We are doing a good analysis on it now, Dean. We will get it back to you.

Okay. Because I don't think we should have used more than about 15 or 20 pounds at the outside for that burn today.

Okay. In work.

Apollo 7, Houston.

Go ahead.

We've got an updated number for you on your chart value.

Go.

Okay. 628.

Ah, ha. That's a little better. That is much better news.

It's 30 pounds more happiness.

That's a heck of a deal, a real hump in that curve.

Roger.

... about our fuel here if we keep that up.

Roger.

Apollo 7, Houston. We are about to lose you at Antigua. We will pick you up at Ascension at 53.

ASCENSION (REV 106)

Apollo 7, Houston through Ascension.

Roger. Loud and clear. I'm pumping it out.
Walt, something - a note of interest here. The $T_{CE}$ that you are reading on your gage is approximately 3 degrees higher than the actual value.

Roger. The - it triggered the master alarm at 178 yesterday. ... 

Okay. Copy that, Walt. And the answer, Wally, to your question on the 16mm camera: at 90 miles, when you are going through perigee, you'll have about 70 percent overlap at one frame per second, and at apogee of 245, you'll have about a 75 percent overlap.

Roger. Thank you.

Houston, Apollo 7. Are you getting our data real time, or do you want us to be recording it?

Houston, Apollo 7. How do you read?

7, could you say again your message?

The DTO requires low bit rate ... is it playing when we leave your control?

Okay. Stand by, Walt.

Walt, we're playing the DSE as normal. We have a high bit rate over the stations. We'll put it low bit rate RECORD as we get LOS and opposite omni.

Roger. Just want you to know: we are doing a DTO now, and we will need the tape recorder back when we leave you.
We'll give it back to you as we leave you, Walt.

Apollo 7, we'd like to go quad Alfa SECONDARY.

Apollo 7, did you copy that?

Roger.

Walt, you are confirming quad A is in SECONDARY now?

Affirmative.

Thank you.

Jack, say again about quad A.

Roger. Wally, we'd like you to switch to secondary tanks on quad Alfa.

You want quad A SECONDARY. Is that correct?

That is correct.

Quad A is now SECONDARY.

Roger.

We're about 1 minute LOS Ascension; we pick you up at Tananarive at 08.

TANANARIVE (REV 106)

Houston - Apollo 7, Houston through Tananarive.

Standing by.

CARNARVON (REV 106)

Apollo 7, Houston through Carnarvon.

Roger.

Apollo 7, opposite omni.

Houston, Apollo 7.

Go ahead, 7.
06 23 27 42 CDR I think you can notice our pitch and yaw staying in quite tightly here; we are just drifting with the roll rate.

06 23 27 48 CC Roger. That's what we're seeing.

06 23 27 50 CDR Roger. Just threw it to you.

06 23 28 54 CC Apollo 7, Houston.

06 23 28 56 CDR Go ahead.

06 23 29 01 CC Wally, on this SCS attitude control test that's coming up: we would like to move it to - from 163 00 to 163 30; this will move it away from perigee, and you'll use less fuel.

06 23 39 16 CDR Ah, ha. That's what I asked yesterday. 163 30?

06 23 29 20 CC Roger. 163 plus 30, begin the SCS attitude control test, and you can cut it off at 163 10. Thought I'd help you out a little bit more: going 40 minutes rather than an hour.

06 23 20 36 CDR Roger.

06 23 29 45 CDR Better take us T plus 3 hours into the test here.

06 23 29 52 CC Say again, Wally.

06 23 29 53 CDR Okay. That's at the temperature part, I see.

06 23 29 55 CC Roger.

06 23 29 56 CDR Okay.

06 23 30 47 CDR I wish they hadn't had that in tight deadband.

06 23 30 54 CDR Also wish we had started at perigee.

06 23 30 57 CC Roger.
06 23 31 05 CDR It seems to be pretty close to the end of the test, so you can just make note of the numbers so I won't have to log them.

06 23 31 11 CC Okay.

06 23 31 14 CDR When you get LOS, just take your last number.

06 23 31 17 CC Copy.

06 23 31 18 CDR Any rolls yet - any motions whatsoever - the drifting part.

06 23 31 24 CC Roger.

06 23 31 50 CDR I'd say it's flying about a two - two and a half degree cone around the three zeros.

06 23 31 56 CC Okay. Copy that.

06 23 31 58 CDR This is very small.

06 23 32 04 CC Wally, is that cone getting any bigger, or is it staying about the same?

06 23 32 08 CDR It seems to be getting just a little bit bigger now; it's going out to three as you can see.

06 23 32 14 CC Roger.

06 23 32 22 CDR It is diverging slightly.

06 23 32 46 CDR That proves a point; pitch is going out.

06 23 33 21 CDR And the flight way rate developing which is making that pitch yaw develop.

06 23 33 27 CC Copy that.

06 23 33 31 CDR And our Q is probably picking up - that's why.

06 23 33 39 CC You're right at apogee now.

06 23 33 43 CDR Oh, it is now?
06 23 33 45 CC  You're 20 minutes -
06 23 33 46 CDR I'll be darned.
06 23 33 47 CDR Oh, yes. We got 45 minutes to go, right?
06 23 34 10 CDR How much more time do you have in this pass?
06 23 34 12 CC We are just about 1 minute LOS Carnarvon. We have a very low angle pass at Guam at 39, then Hawaii at 50.
06 23 34 25 CDR Roger. I'm only about a minute away from end of test, so you can take these angles for us.
06 23 34 31 CC Okay. We are copying them.
06 23 34 34 CDR Roger.
06 23 34 40 CDR The reason yaw is decreasing, of course, is we are flying across the belly band now.
06 23 34 45 CC Roger.

GUAM (REV 106)
06 23 41 29 CC Apollo 7, Houston through Guam.
06 23 41 33 LMP Roger. Jack, incidentally, I'm manually balancing my hydrogen tanks now, and I'd appreciate it if you guys would keep an eye on those quantities and let me know when you think we're close on the balancing. You're a little more accurate than I am.
06 23 41 47 CC Will do.

HAWAII (REV 106)
06 23 51 45 CC Apollo 7, Houston through Hawaii.
06 23 51 50 CDR Roger.
Apollo 7, Houston through California.

Roger. I want to record a comment that people ought to be concerned about the high forces on the switches that may close a loop by touching a liquid at the same time they activate the switch. As a result, we don't move around the cockpit.

It's on its way, Roy.

Roger.

Apollo 7, would you turn up your S-band so we can get you S-band through Goldstone?

Apollo 7, how are you reading through Goldstone?

Loud and clear.

Roger.

We're starting into perigee and BEF, and it looks like it's going to slip right over to SCS, so I'll just let her ride.

Okay. Copy that.

I want to see if it stays at SCS. Apparently, it likes SCS best.

Roger. It's streamline, I guess.

Yes, it does.

And, Wally, Joe is in the viewing room.

Very good. I'll drop in some time next week.
07 00 05 19  CC  Roger.
07 00 05 27  CDR  I'll drop in the fun room and thank you cats for a pretty good show.
07 00 05 32  CC  Roger.
07 00 05 44  CDR  Assuming Lew Allen and Bill Shaffer can target pretty well.
07 00 05 51  CC  He'll be happy to hear that.
07 00 06 14  CC  Roger.
07 00 06 16  CDR  All we're doing is pulsing yaw and roll here, Jack.
07 00 06 20  CC  Okay.
07 00 06 21  CDR  Just looking right over the top.
07 00 06 22  CC  Okay. Okay. Copy that.
07 00 06 24  CDR  We ought to have enough time to go on around on the roof in apogee.
07 00 06 34  CDR  ... the clock since we started our flight.
07 00 06 58  CC  I didn't copy that, Wally.
07 00 07 00  CDR  You can see the radial develop into a process giving the same attitude as we did at 57.
07 00 07 09  CC  Okay. Copy that, Wally.
07 00 07 11  CDR  And we're not at perigee yet either, are we?
07 00 07 21  CC  Not quite at perigee, Wally.
07 00 07 24  CDR  About 13?
07 00 07 44  CC  Wally, you will be at perigee in 7 minutes.
07 00 07 47  CDR  Roger.
07 00 07 51  CDR  Jack, the torque changes even faster than it has before.
07 00 07 56  CDR  One-tenth per second in pitch.
07 00 08 02  CC  Roger. Copy.
07 00 08 06  LMP  Hey, Jack, have you guys figured any leveling off of this condenser drop temperature yet?
07 00 08 18  CC  Okay. Wait, it appears to be leveling off slightly, but we're still watching it. It's not conclusive yet.
07 00 08 25  LMP  Roger.
07 00 08 27  CDR  On this - PTA where we had attitude hold MAX dead-band: we had MAX deadband rate power LOW and limit cycle ON and OFF.
07 00 08 38  CC  Okay. Stand by.
07 00 08 40  CDR  Okay.
07 00 09 13  CC  Roger. Wally, that will be rates LOW, limit cycle OFF.
07 00 09 21  CDR  And MAX deadband only. Okay.
07 00 09 26  CDR  We're almost up to six-tenths of a degree per second here.
07 00 09 30  CC  Roger. We're copying the rates.
07 00 09 32  CDR  Great. I think we all agree it was a good idea to shift this thing.
07 00 09 36  CC  Roger.
07 00 11 33  CDR  GOLDSTONE through ANTIGUA (REV 107) Apollo 7, Houston.
07 00 11 38 CDR Go ahead.
07 00 11 39 CC Wally, when we begin this SCS attitude control test, we'll get a little more information down here on telemetry if you'll put your GDC on FDL number 1.
07 00 11 52 CDR Roger.
07 00 11 59 CDR We're really whistling around up here.
07 00 12 03 CC And we're seeing those rates.
07 00 12 06 CDR We're having our noon chow with pea soup and all that good stuff right now.
07 00 12 12 CC Roger.
07 00 12 18 CDR Nobody will swap for the bite size. They're just throwing them all away.
07 00 12 24 CC Copy that.
07 00 12 44 CC 7, when do you feel you will be getting into SPS cold soak attitude?
07 00 12 51 CDR Oh, soon as this rate starts dropping off, Jack. I've got six-tenths; it's decreasing now, so I should hit 180 pretty shortly.
07 00 13 00 CC Okay. Copy.
07 00 13 03 CDR I'll stop it on this revolution here.
07 00 13 06 CC Okay.
07 00 13 14 CDR I'll be going through a - about 75 degrees pitch down.
07 00 13 18 CC Roger.
07 00 13 25 CDR Are we going over Bermuda?
07 00 13 29  CC  You are going down the islands just north of Cuba.
07 00 13 33  CDR  Okay.
07 00 15 08  LMP  Hey, Jack, how about a map update, please.
07 00 15 12  CC  In work, Walt.
07 00 15 23  CDR  Notice how the rate has damped out.
07 00 15 29  CC  Roger, Wally.
07 00 15 51  CC  Walt, we're showing that oxidizer line temperature is getting close to the heater limit. You might look for that.
07 00 16 03  LMP  I have been operating my heaters on the propellant tank line temperature.
07 00 16 08  CC  Roger.
07 00 16 12  CDR  I have just shot frames 20 and 21 of islands in coral reef, magazine R.
07 00 16 18  CC  Copy.
07 00 16 21  CDR  18 and 19 also.
07 00 17 29  CC  Apollo 7, Houston. I have your map update.
07 00 17 32  LMP  Roger.
07 00 17 34  CC  Okay. Walt, for REV 110: time of the node 173 plus 44 plus 35, longitude 64.6 degrees east.
07 00 17 57  LMP  Roger.
07 00 18 14  CDR  And frame 16, magazine R was another island in that same chain.
07 00 18 22  CC  Roger. Copy that.
07 00 18 54  LMP  Hey, Jack, do you have the time of our closest approach to Ascension?
07 00 19 01 CC  Stand by, Walt.
07 00 19 49 CC  Wait, your time of crossing Ascension will be approximately 32 48.
07 00 19 59 LMP  32 48? Looks like we come pretty close to it.
07 00 20 05 CC  Roger.
07 00 21 45 CDR  We're going to that attitude now.
07 00 21 48 CC  Roger. Copy.

ASCENSION (REV 107)

07 00 28 56 CC  Apollo 7, Houston through Ascension.
07 00 29 30 CC  Apollo 7, Houston through Ascension.
07 00 30 27 CC  Apollo 7, Houston through Ascension.
07 00 30 32 CDR  Roger.
07 00 36 24 CC  Apollo 7, Houston. We're about to lose you at Ascension; pick you up at Tananarive at 168 plus 44.

TANANARIVE (REV 107)

07 00 46 16 CC  Apollo 7, Houston through Tananarive.
07 00 46 37 CC  Apollo 7, Houston through Tananarive. Standing by.
07 00 48 31 CC  Apollo 7, Houston through Tananarive. Standing by.
07 00 52 51 CC  Apollo 7, Houston. One minute LOS Tananarive; Carnarvon on the hour.

CARNARVON (REV 107)

07 01 00 18 CDR  Houston, Apollo 7 here.
07 01 00 21 CC  Roger, 7. Go ahead; we're standing by.
07 01 00 24 CDR  Okay. Jack, I understood that you wanted to knock off the attitude hold at 169 hours and 10 minutes.
Does that mean you want to terminate the test at that time as well?

Stand by, Wally.

Jack, a little further on that - we're sitting at 65 now on the SPS propellant tank temperature, and it's lowest it's been, and it's not about to get down to any 45 by the end of this test.

Roger. Understand, Walt. Stand by.

Apollo 7, Houston.

Go, Jack.

Okay. Walt, on the SPS temperatures: we've had a data loss here. We hope to be back in shape at Gumm, and we'll take a look at the temperatures there and give you a little bit further back on this cold soak test. And on the termination of the attitude control test at ten: that was for the MIN deadband high rate; then we pick up this MAX deadband low rate test from there on. We should be through with that before we get down into perigee.

I'm MAX deadband low rate now.

Okay. Real fine.

41 and 10, MAX deadband high rate?

Roger.

If we go MAX deadband in high rate, that will be good enough for the cold soak, so I'll do that at ten.
Okay. The attitude before should have been MIN deadband high rate; now we should be MAX deadband low rate.

Okay. I'll reverse it; I had MAX deadband low rate so far.

Okay. Then pick it up MIN deadband high rate, and we'll try to get done before we go through perigee.

Okay. I'll switch it now, then, Jack, just to make it early.

Okay.

Hey, Jack, you may have lost your data readout, but I've got good ones on board here; and I've checked the oxidizer line temperature down the wall, and it looks like it's a little - something a little under 170. Propellant tank temperatures are 165, and that should be as good as your data readout. What I'm saying is that we're never going to get down to the point where I'm going to kick a heater out. I might suggest that when we do terminate this test, it will be useful to turn on the SPS line heaters to A slash B and watch for a rise at least to see if they're working at all.

Okay. We copy that.

Okay. Do you concur with that?

We're going to put that in the mill and discuss it here.
<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 01 04 16</td>
<td>CDR</td>
<td>Jack, on Tananarive, it turns out you can broadcast in the blind to us there, and the odds are we'll get it, but we can't seem to talk back to you.</td>
</tr>
<tr>
<td>07 01 04 25</td>
<td>CC</td>
<td>Okay. Fine, Wally.</td>
</tr>
<tr>
<td>07 01 04 26</td>
<td>CDR</td>
<td>We'd like you to pass that on to the other flight controllers.</td>
</tr>
<tr>
<td>07 01 04 30</td>
<td>CC</td>
<td>Will do.</td>
</tr>
<tr>
<td>07 01 04 31</td>
<td>CDR</td>
<td>Thank you.</td>
</tr>
<tr>
<td>07 01 06 14</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>07 01 06 17</td>
<td>CDR</td>
<td>Go ahead, Jack.</td>
</tr>
<tr>
<td>07 01 06 18</td>
<td>CC</td>
<td>Roger. We've got data back now, and we need about 40 minutes at this MN deadband high rate; then you can return to the normal cold soak attitude configuration.</td>
</tr>
<tr>
<td>07 01 06 35</td>
<td>LMP</td>
<td>Would you say that is a new good configuration - you want 40 minutes of it - and that you want to keep going with this cold soak test?</td>
</tr>
<tr>
<td>07 01 06 44</td>
<td>CC</td>
<td>Affirm. We'll look at it over Guam and see what the trend is there.</td>
</tr>
<tr>
<td>07 01 06 50</td>
<td>LMP</td>
<td>If you don't hear data, you can always ask me on the loop, and I'll give you my readouts. They're supposed to be prime.</td>
</tr>
<tr>
<td>07 01 06 57</td>
<td>CC</td>
<td>Okay. We've got data now.</td>
</tr>
<tr>
<td>07 01 07 03</td>
<td>CDR</td>
<td>...</td>
</tr>
<tr>
<td>07 01 07 12</td>
<td>CC</td>
<td>Say again, Wally.</td>
</tr>
</tbody>
</table>
07 01 07 15  CDR  Could you find the COMBAT operation? We lost the line down there someplace.

07 01 07 28  LMP  Hey, Jack, can you give me a readout of hydrogen tank 1 quantity and hydrogen tank 2 quantity - what you show?

07 01 07 35  CC  Okay. Stand by.

07 01 07 48  CDR  Jack, the reason I made that remark - after about 8 days of staring at clocks down there, I'm sure you guys are beginning to think they're all right.

07 01 07 57  CC  Roger. Wally, we'll get back to you on that; we'll discuss that pretty closely, and I'm getting your tank quantities, Walt.

07 01 08 06  CDR  Very good.

07 01 08 15  CC  Walt, on the hydrogen quantities: tank 1 39.8, tank 2 37.6.

07 01 08 24  LMP  Roger. I'll continue with the balancing. I'm wondering about the feasibility of maybe over-shooting about 1 percent with tank 1.

07 01 08 37  CC  Roger.

07 01 08 51  CC  And, 7, we're about 1 minute LOS Carnarvon; we pick up Guam at 169 12.

07 01 08 57  CDR  Roger. With perigee only 36 minutes away, you want 40 minutes on this control mode. That should be interesting.

07 01 09 05  CC  Roger. Wally, we had intended to do the MIN dead-band high rate first to minimize the RCS firing as we went through perigee.
GUAM (REV 107)

07 01 13 09 CC Apollo 7, Houston through Guam.
07 01 13 12 CDR Roger. Loud and clear.
07 01 13 15 CC Roger. Wally, we —
07 01 13 16 CDR I was just thinking we are getting worried about all the paper work; it's accumulating on our desks about preparing for this mission.
07 01 13 23 CC Roger. Wally, we have a state vector update and a DAP update we would like to send you. Would you go to ACCEPT?
07 01 13 31 CDR You got it.
07 01 13 32 CC Coming up.
07 01 13 41 CC And, Walt, I have the NAV check PAD to read whenever you are ready to copy.
07 01 13 49 CDR What time is perigee? I have it written as 44.
07 01 14 01 CC Okay. Wally, that's about right —
07 01 14 02 LMP Go with your NAV update.
07 01 14 04 CC Okay. The NAV check: GET of 175 plus 30 plus 0000 plus 2562 plus 09300 1407.
07 01 14 30 LMP Roger. 175 30 0000 plus 2562 plus 09300 1407. Over.
07 01 14 38 CC Roger. That's correct.
07 01 15 04 CC And, Walt, I have — I would like to read you up the verification of the DAP data load we are passing you.
07 01 15 11 LMP Roger. We can read it right back to you in a minute.
07 01 15 14 CDR Is that the end of the update?
07 01 15 20 CC Negative.
07 01 15 22 CDR Okay. Standing by.
07 01 15 23 LMP Go ahead with the DAP update, Jack.
07 01 15 26 CC Okay. NOUN 47 - I'll read you R1, R2, and R3: plus 00139 plus 00455 plus 24921 NOUN 48 minus 00078 minus 00130 plus 02412.
07 01 16 17 CC Were you able to copy that, 7?
07 01 16 19 LMP I didn't get the NOUN 48. Would you say NOUN 48?
07 01 16 22 CC Okay. Minus three balls 78 minus two balls 130 plus 02412.
07 01 16 39 CDR Is the update finished?
07 01 16 42 CC Affirmative, Wally. The computer is yours.
07 01 17 24 CDR That's GO on NAV update.
07 01 17 31 CC Say again, Wally?
07 01 17 33 CDR GO on that NAV update.
07 01 17 34 CC Roger. Copy that.
07 01 18 17 CC And, 7, when you can, would you switch your BIOMED to LMP?
07 01 18 26 CDR I want to remind you I'm going to break up another plug today and leave it off. There's a broken wire I don't want to have on when I put the suit back on.
07 01 18 38 CC Roger. Copy that.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
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<tbody>
<tr>
<td>07 01 18 50</td>
<td>LMP</td>
<td>Should that program be stuck in POO this long?</td>
</tr>
<tr>
<td>07 01 19 00</td>
<td>CC</td>
<td>Stand by.</td>
</tr>
<tr>
<td>07 01 19 02</td>
<td>CDR</td>
<td>We are running in POO here. We'll let it ride out for awhile.</td>
</tr>
<tr>
<td>07 01 19 08</td>
<td>LMP</td>
<td>You probably won't get anything on my BIOMED, Jack.</td>
</tr>
<tr>
<td>07 01 19 19</td>
<td>CC</td>
<td>Okay. Wally, we feel that the computer will be finished with program 00 just shortly and Roger on your BIOMED data, Walt.</td>
</tr>
<tr>
<td>07 01 19 45</td>
<td>LMP</td>
<td>NOUN 47 - NOUN 48 is GO.</td>
</tr>
<tr>
<td>07 01 19 49</td>
<td>CC</td>
<td>Roger. Copy that.</td>
</tr>
<tr>
<td>07 01 20 00</td>
<td>LMP</td>
<td>Does everybody down there concur with letting hydrogen tank 1 get down about 1 percent lower than tank 2?</td>
</tr>
<tr>
<td>07 01 20 08</td>
<td>CC</td>
<td>In work, Walt.</td>
</tr>
<tr>
<td>07 01 20 10</td>
<td>CDR</td>
<td>Okay. Perigee is at 45 now.</td>
</tr>
<tr>
<td>07 01 20 14</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 01 20 35</td>
<td>CC</td>
<td>Walt, we would like to balance these hydrogen tanks as close as possible to each other.</td>
</tr>
<tr>
<td>07 01 20 42</td>
<td>LMP</td>
<td>Understand. I will stand by for your call. I show right now that they are getting pretty close; I'd say maybe 2 percent apart.</td>
</tr>
<tr>
<td>07 01 20 53</td>
<td>CC</td>
<td>We'll give you a call.</td>
</tr>
<tr>
<td>07 01 20 57</td>
<td>CC</td>
<td>And we are 1 minute LOS Guam; we pick you up at Hawaii at 27.</td>
</tr>
<tr>
<td>07 01 21 02</td>
<td>CDR</td>
<td>Very good.</td>
</tr>
</tbody>
</table>
07 01 28 15  CC Apollo 7, Houston through Hawaii.
07 01 28 19  CDR Aloha.
07 01 28 21  CC Walt, could you tell what omni antenna you're on now?
07 01 28 26  LMP Omni C.
07 01 28 28  CC Okay for a COMM test here, and let us know if you switch omni's, will you?
07 01 28 36  LMP Well, I'm always operating A and C, switching when you call unless something comes up where I think something in between is better.
07 01 28 42  CC Okay. Fine.
07 01 31 47  LMP Hey, Jack, this is Walt. We took frames 37 and 38 of the ... portraits.
07 01 31 55  CC Roger. Copy.
07 01 31 57  LMP Magazine II.
07 01 31 58  CDR Jack, when can I put this in sloppy deadband?
07 01 32 04  CC Okay. We'll get to that, Wally.
07 01 32 07  CDR Okay. ...
07 01 32 11  CC Okay. Copy.
07 01 32 13  CDR And if you've been reading our DSKY, you can see I'm pretty close to SCF.
07 01 32 22  CC Okay. I'll get back to you as soon as I can.
07 01 32 25  CDR Okay. It starts torquing about ... as you approach perigee, about 20 minutes before perigee.
07 01 32 32  CC Okay. I copy.
<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 01 32 58</td>
<td>CC</td>
<td>Apollo 7, opposite omni. Wally, is it starting to torque now?</td>
</tr>
<tr>
<td>07 01 33 02</td>
<td>CDR</td>
<td>Just a little bit. Why don't you let me flip it over and see if it starts hitting it pretty hard?</td>
</tr>
<tr>
<td>07 01 33 08</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>07 01 33 15</td>
<td>CDR</td>
<td>I can actually feel the spacecraft working. It's starting to torque now.</td>
</tr>
<tr>
<td>07 01 33 21</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>07 01 33 47</td>
<td>CDR</td>
<td>Not as bad because of - why don't we see if we can stick with it because she's riding up the same way she would on inertial. Oh. I'll have to go back down ... GDP ...</td>
</tr>
<tr>
<td>07 01 34 09</td>
<td>CC</td>
<td>Okay. Wally, you can terminate the MIN deadband at any time now, depending on your thruster activity. We've got enough data at any time now.</td>
</tr>
<tr>
<td>07 01 34 37</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
</tbody>
</table>

**HUNTSVILLE through ANTIGUA (REV 107)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 01 34 58</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>07 01 35 21</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>07 01 36 07</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>07 01 36 17</td>
<td>CC</td>
<td>Apollo 7, Houston. You can terminate the MIN deadband attitude test at anytime now; we have enough data.</td>
</tr>
<tr>
<td>07 01 36 29</td>
<td>CDR</td>
<td>Roger. I'm going lose deadband for SPS.</td>
</tr>
<tr>
<td>07 01 36 33</td>
<td>CC</td>
<td>Roger. Copy that.</td>
</tr>
<tr>
<td>07 01 36 34</td>
<td>CDR</td>
<td>Limit cycle ON, ... MAX rate high.</td>
</tr>
</tbody>
</table>
Houston, do you read? Apollo 7.
Roger, 7. You are five-by.
Okay. Do you see my GDC on number 1 ball?
We're — we don't have telemetry over the Huntsville, Wally.
Okay. That's the third time; I just did it again.
It flipped 180 degrees in pitch, and it did it on number 2 ball; it's terminated its discrepancy.
I'll have to do another real line of GDC.
Roger. You say this exists just on the number 1 FTI?
That's affirmative.
Roger.
I have number 1 and 2 on the blockup —
Apollo 7, Houston.
There we go. Loud and clear.
Roger.
Okay. You got TM on me now?
Affirmative.
Okay. I'm on number 1 ball, DMU number 2, GDC, with ORDEAL ON.
Okay.
I'll put number 2 back to GDC; now can you see all this stuff. GDC on number 2 now, and it powers right in. Now, I'll put GDC on number 1.
Okay. Wally, we can't see number 2 ball data.
There goes number 1 right now; that is sayanora.

Okay.

It's a ... on GDC.

Okay. Walt, we've got a - we are approaching a heater cycle on tank 1. We would like to have you read out AC 1, phase A, B, and C now, and then during the heater cycle.

Roger. Phase A is 11h-1/2, B is 116, C is 11h-1/2.

Okay. And we will let you know - you don't have to watch it - we will let you know when the heaters come on; then you can read it out again.

Roger. And what do you think about when we terminate this SPS DTO - and I would suggest we do that any time - how about turning the heaters on AB position for long enough to observe a temperature rise to be sure they are working?

Okay. Walt, we are still discussing that down here. Tentatively, the answer is negative.

Okay. Just trying to help.

Jack, I think we are pitching up b. holding inertial attitude at about the rate we would want to torque up, so I guess we can just hang in here on this perigee.

Okay.

It's just about going through the same window.

We lucked out. We went right through SCS at the right time.
Roger.

Don't let Shaffer get credit for that one, whatever you do.

(Laughter) Roger.

Apollo 7, Houston.

Go ahead.

Walt, on your EKG problem: do you think you will be able to restore the harness today?

I don't know how I'm ever going to restore it. We have taken a good look at the leads. I was told last night it was probably the sternal leads; all my connections are made up. Wally took a look at them; it looks like we've got all the connections made. The only thing I can think of is a broken wire inside the lead someplace. Are you getting anything on me at all?

Just respiration, Walt.

Jack, I would like to check with you. Do you know which sternal lead it is? We could change the sensor, but that's about all. The wiring is intact.

Okay.

All of it.

Okay. Might get those people to go to work on that Mickey-Mouse wiring. It is not up to the standards as far as durability is concerned for 7 or 8 days.
Okay. Wally, they tell me that should work. And, Walt, they say you might try to make the same fix that Wally did on his.

Do you want to put his - what you want to do - you going to give up EKG and keep respiration only?

Stand by, Wally.

That's what you've got on me now, I think.

Okay. Walt, they want to swap respiration for EKG leads.

You mean you want to swap the plug connectors on the amplifiers, is that it? Signal conditioners?

That's right.

Okay. We will do that. It may take a little while.

If I can do it, I'll unhook the yellow one and hook it to the white one, and vice versa. I've got - what? Yes, I've got enough wire here so that they might even reach. Retool deal ...

I think he could reach over to me with it with the wire he has.

Copy that.

HUNTSVILLE through ANTIGUA (REV 108)

Houston, Apollo 7.

Go ahead.
I'd like to update you on my water chlorination system. We remarked on a discrepancy there last night. The container that holds the ampules - that have interfaces with the pen plunger that penetrates the water servicing valve: at interface, there is a brown fluid all around the system outside the -

Apollo 7, Houston.

Apollo 7, Houston.

Roger. Did you read all right?

Negative. Wally, we got a handover just about that time. Before we continue, could we - we got a report that the heater is on. Could you read out your AC 1 phase A, B, and C again?

114-1/2, 115-1/2, 114-1/2.

Roger. Copy that.

Are you getting anything on me now?

And, Wally, we got pretty much the same report on the chlorination system now. Have there been any changes from last night?

Negative. We're just about to watch to see it grow. That goop seems to be rocking in the middle.

Okay. Copy that.

That fitting in the water system was scheduled for chlorine later today.
07 01 50 10  CC  Okay. We copy that.
07 01 54 22  CC  Apollo 7, Houston.
07 01 54 26  CDR  Roger.
07 01 54 28  CC  Wally, we had a premature data LOS there. Could we get you to go your up-telemetry command switch to RESET NORMAL?
07 01 54 37  CDR  I would like to restate on the chlorination that we find that every other day is satisfactory. We have no objection to that.
07 01 54 44  CC  Okay. Copy that. Wally, do you think that you could wipe off this brown spot?
07 01 54 49  CDR  I guess we could. I'm not sure what it is, though. That's why.
07 01 54 54  CC  Okay.
07 01 54 56  SC  That's what I would do in my own home, but I'm not sure about the correct input in this biomedical log. There's really nothing for it in my book up here.
07 01 55 10  LMP  If we wipe it off, who is going to get a chance to take a look at it afterwards to see what it was?

ASCENSION (REV 108)

07 02 06 00  CC  Apollo 7, Houston through Ascension.
07 02 06 05  LMP  Yes, this is Apollo 7. How do you read?
07 02 06 13  CC  Roger, Walt. Standing by.
07 02 06 15  LMP  Roger. Can you check your log and find out what time I turned the H₂₁ - H₂₂ heater off this morning?
07 02 06 23  CC  Wilco.
07 02 06 28  CC  Apollo 7, Houston.
07 02 07 31  LMP  Go, Jack.
07 02 07 32  CC  Roger. The best data we had there was 167 plus 53.
07 02 07 39  LMP  Thank you. And what are the readouts now on H₂ 1 and H₂ 2 quantities?
07 02 08 03  CC  Including - 39.4, Walt, and 37.6.
07 02 08 10  LMP  Okay. They seem to be coming apart. If that's a little bit too slow, I can turn the fans off in tank 2. Just fix it up occasionally.
07 02 08 21  CC  Just hold what we got, Walt.
07 02 08 25  LMP  Okay.
07 02 10 49  CC  Apollo 7, Houston. One minute LOS Ascension; Tananarive at 170 plus 20.

TANANARIVE (REV 108)

07 02 20 50  CC  Apollo 7, Houston through Tananarive. Standing by.
07 02 29 43  CC  Apollo 7, 1 minute LOS Tananarive; Mercury at 46.

MERCURY through GUAM (REV 108)

07 02 48 40  CDR  Houston, Apollo 7. Standing by.
07 02 48 45  CC  Roger. Apollo 7, Houston.
07 02 48 47  CDR  Not gonna try you anymore.
07 02 48 50  CC  Roger. Relative to Walt's question on the SPS heater after the cold soak test: we do not - do not want to activate these heaters; we want to look at the data first.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 02 49 05</td>
<td>CDR</td>
<td>Understand.</td>
</tr>
<tr>
<td>07 02 49 08</td>
<td>CC</td>
<td>And, Wally, we would like to do a fuel cell O₂ purge at L71 plus 30.</td>
</tr>
<tr>
<td>07 02 49 18</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 02 49 35</td>
<td>LMP</td>
<td>Hey, Jack, how are you reading my BIOMED now?</td>
</tr>
<tr>
<td>07 02 49 41</td>
<td>CC</td>
<td>Stand by, Walt.</td>
</tr>
<tr>
<td>07 02 49 50</td>
<td>CC</td>
<td>Walt, you did good work. We have good BIOMED data.</td>
</tr>
<tr>
<td>07 02 49 55</td>
<td>LMP</td>
<td>All of it, or just EKG's, or what?</td>
</tr>
<tr>
<td>07 02 50 00</td>
<td>CC</td>
<td>Just EKG.</td>
</tr>
<tr>
<td>07 02 50 04</td>
<td>LMP</td>
<td>Is my heart still pumping?</td>
</tr>
<tr>
<td>07 02 50 07</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>07 02 50 09</td>
<td>LMP</td>
<td>I feel relieved now.</td>
</tr>
<tr>
<td>07 02 50 12</td>
<td>CDR</td>
<td>That thing is not going to work very long, either; it's just taut right across his stomach.</td>
</tr>
<tr>
<td>07 02 50 17</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 02 50 36</td>
<td>CDR</td>
<td>Do you have any more words of wisdom on the chlorine injector?</td>
</tr>
<tr>
<td>07 02 50 43</td>
<td>CC</td>
<td>Stand by, Wally.</td>
</tr>
<tr>
<td>07 02 50 45</td>
<td>CDR</td>
<td>We aren't scheduled to use it tonight, anyway, but they can just go ahead and think on that one for a while.</td>
</tr>
<tr>
<td>07 02 51 57</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>07 02 51 59</td>
<td>CDR</td>
<td>Go.</td>
</tr>
<tr>
<td>07 02 52 01</td>
<td>CC</td>
<td>Wally, we are expecting to chlorinate tonight since we didn't do it last night, but relative</td>
</tr>
</tbody>
</table>
to the brown spot, we are trying to get more
data on that to pass up to you.

07 02 52 13  CDR I checked my log - I think I did last night, and
that's where we got the brown spot.

07 02 52 22  LMP Yes, last night we did chlorinate.

07 02 52 29  CC Say again, Walt.

07 02 52 30  CDR We chlorinated last night at 150 hours, approx-
imately.

07 02 52 35  CC Okay.

07 02 52 41  CDR We're giving you a lot of lead time on the
problem.

07 02 52 44  CC Roger. Thank you.

07 02 52 46  CDR You can check with any other country you'd like.

07 02 53 06  CC Okay. Wally, we concur with your chlorination;
we won't chlorinate tonight.

07 02 53 11  CDR Roger. You just might play games with one of
those injectors and see what the heck is down
there.

07 02 53 17  CC Good idea.

07 02 53 18  CDR It's between the injector and the deal that hooks
up with the spacecraft; there's a pin in it.

07 02 53 26  CC Okay.

07 02 53 28  CDR I change it. The place where the small end of the
chlorine ampule is pierced; that's where the brown
stuff collects.

07 02 53 38  CC Roger. Copy that.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 02 53 40</td>
<td>CDR</td>
<td>Very good.</td>
</tr>
<tr>
<td>07 02 53 42</td>
<td>LMP</td>
<td>We've got almost 48 hours; we are at 24 hours, now.</td>
</tr>
<tr>
<td>07 02 54 58</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>07 02 55 00</td>
<td>LMP</td>
<td>Go ahead, Jack.</td>
</tr>
<tr>
<td>07 02 55 02</td>
<td>CC</td>
<td>Wait, sometime at your convenience, we would like a command module RCS temp readout.</td>
</tr>
<tr>
<td>07 02 55 07</td>
<td>LMP</td>
<td>Roger. I'll get that shortly.</td>
</tr>
<tr>
<td>07 02 55 20</td>
<td>CC</td>
<td>Apollo 7, opposite omni.</td>
</tr>
<tr>
<td>07 02 55 28</td>
<td>LMP</td>
<td>Roger. We are ready now.</td>
</tr>
<tr>
<td>07 02 55 32</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 02 55 52</td>
<td>LMP</td>
<td>Okay. 5A - 5C 5 volts, 5D 5 volts, 6D 5 volts, 6C 5 volts, 6 Baker 5 - wait - 6 Baker 5 volts, 6 Able 5 volts.</td>
</tr>
<tr>
<td>07 02 56 14</td>
<td>CC</td>
<td>Roger. Copy those, Walt.</td>
</tr>
<tr>
<td>07 02 56 18</td>
<td>CDR</td>
<td>Jack, what's the cutoff on this cold soak test?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Have we reached it yet?</td>
</tr>
<tr>
<td>07 02 56 26</td>
<td>CC</td>
<td>Wally, it's about 171 10.</td>
</tr>
<tr>
<td>07 02 56 31</td>
<td>CDR</td>
<td>Okay. That's the same cutoff we had - it was started later than original.</td>
</tr>
<tr>
<td>07 02 56 42</td>
<td>CC</td>
<td>Okay. There's a correction, Wally. It's 171 plus 22 because we started late.</td>
</tr>
<tr>
<td>07 02 56 47</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HAWAII (REV 108)</td>
</tr>
<tr>
<td>07 03 05 10</td>
<td>CC</td>
<td>Apollo 7, Houston through Hawaii.</td>
</tr>
<tr>
<td>07 03 05 16</td>
<td>CDR</td>
<td>We report all quiet here.</td>
</tr>
</tbody>
</table>
Roger. Donn, when you go to power down today, just as a reminder, don't forget to deactivate that DAP.

Got that. We've got Donn on the rack, and we know how to do that stuff.

Roger. We were just worried about a jet fire.

Roger. The number 1 window is now collecting condensation on the lower edge, the edge nearest the grid cell. There's some large specks as long as three-eighths of an inch and about an eighth of an inch wide on it. Most of the specks are about a thirty-second of an inch in diameter; a lot of dust collection on the outer surface of the inner pane and the condensates on the inner surface of the outer pane. The little specks are from the dump system on the outer surface of the outer pane. Number 2 window has the sun on it now, and the smoke effect I don't think has increased any, but as we originally reported, that's probably from lower jettison. Guess the window looks quite good. Number 3 window, the hatch window, collected so much condensates, it's almost smoothed over. There is a circle about 2 and 1/2 inches in diameter that has the same crystal structure; this is all collected on the inner surface of the outer pane. That's a very bad show on that
window. Number 4 window is about the same as number 2; and number 5 window, the side window, is also collecting condensate on the inner surface of the outer pane but does not have the dump particles collecting on it.

Okay. Wally, that was a real fine window status.

We've written in our log that beards are no good. Did you copy that?

Say again, Wally.

We've entered in our logs that beards are no good. I couldn't read it.

We wrote in our log - our flight plan log - that facial beards are no good.

I copied that.

At 7, we're 21 hours and 22 minutes - we might as well start you boys cracking on figuring how much fuel we have left, and I'll get our DELTA for these two DTO's.

Okay. Wally, in work.

Roger. And we noticed a gross change in temperature; it looks like it's going up.

We concur.

The SPS propellant tank temperature is now reading 68.

Roger.

Jack, how about a hydrogen 1 quantity and hydrogen 2 quantity?
<table>
<thead>
<tr>
<th>Time</th>
<th>ID</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 03 09 13</td>
<td>CC</td>
<td>Okay. Walt, the hydrogen, 39.0, 37.2.</td>
</tr>
<tr>
<td>07 03 09 23</td>
<td>LMP</td>
<td>Roger. Pitch rate ... think that kept up.</td>
</tr>
<tr>
<td>07 03 09 31</td>
<td>LMP</td>
<td>We estimate 4 more days.</td>
</tr>
<tr>
<td>07 03 09 35</td>
<td>CC</td>
<td>I couldn't read that, 7.</td>
</tr>
<tr>
<td>07 03 09 37</td>
<td>LMP</td>
<td>We estimate 4 more days ...</td>
</tr>
<tr>
<td>07 03 09 47</td>
<td>CC</td>
<td>Roger. Copy that.</td>
</tr>
<tr>
<td>07 03 09 49</td>
<td>CC</td>
<td>Hey, Wally, a couple of quick questions on the FTI problem that you had back: did the FTI flip occur with the ORDEAL and GDC operating on ball number 1?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>HUNTSVILLE (REV 108)</td>
</tr>
<tr>
<td>07 03 10 18</td>
<td>CDR</td>
<td>... you now? ... GDC, and we'll see how long it lasts.</td>
</tr>
<tr>
<td>07 03 10 24</td>
<td>CC</td>
<td>Okay. Wally, your answer started just at the handover to the Huntsville. Could you say again?</td>
</tr>
<tr>
<td>07 03 10 31</td>
<td>CDR</td>
<td>We have our GDC on ball 1. We're doing a leak.</td>
</tr>
<tr>
<td>07 03 10 37</td>
<td>CC</td>
<td>Was ORDEAL and GDC operating at the same time on ball number 1?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GUAYMAS (REV 108)</td>
</tr>
<tr>
<td>07 03 17 21</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>07 03 17 24</td>
<td>CDR</td>
<td>Loud and clear.</td>
</tr>
<tr>
<td>07 03 17 25</td>
<td>CC</td>
<td>Roger. Wally, here is a chart value for your RCS fuel.</td>
</tr>
<tr>
<td>07 03 17 31</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>07 03 17 33</td>
<td>CC</td>
<td>Roger. 614 quad A is still the limiting quad, but still above all RCS redlines.</td>
</tr>
</tbody>
</table>
Very good.

And, Walt, could you give us a batt C readout when you have a minute?

36.2.

Roger. Copy. And your hydrogen imbalance is improving now. We've gone from 3.4 to 1.8 difference.

Wally, I missed some of the answers to the question I asked about the FTI problem you had. Did this 180 degree flip occur when the ORDEAL and the GDC were on ball number 1?

Negative. I've now got a ... You've got FTI ... on ball number 1. I'll give it ... ball number 1. Here it comes, GDC. Do you read?

We aren't getting the data right now, Wally.

You're not?

Negative. We've got a low antenna angle here at Guaymas.

Oh. I'll hold off here a second.

Okay. Wally, it doesn't look like we are going to get any data at all here at Guaymas because of the keyhole.

I've got about a 172 pitch, slipping to an FTI on number 1, and the ball slips right over to 022 pitch, so I can't seem to get GDC to lock on ball number 1.
But it's fine on number 2.

Does this flip occur just at the time that you're switching GDC to ball number 1?

That's correct.

Okay. Copy.

All this is clocked now. Do you want the data, Jack?

Okay. We're just about to lose you at Guaymas; we'll pick you up at Tananarive at 56.

Roger.

TANANARIVE (REV 109)

Apollo 7, Houston through Tananarive.

Apollo 7, Houston. One minute LOS Tananarive; Mercury at 172 plus 21.

MERCURY (REV 109)

Apollo 7, Houston through Mercury.

Roger, Jack.

Hey, Jack, I would like to get a flight plan update on when they plan on activating the primary water boiler and for how long.

Okay, Walt, in work. And, Walt, here are some redlines I used on your RCS that you might be interested in.

What are they on, Jack? Redlines for what?
07 04 22 06  CC  Your RCS redlines. In SC3 deorbit, we'll use
558 pounds as the redline. Your DAP redline is
487, and your hybrid redline is 252.

07 04 22 24  LMP  Thank you.

GUAM (REV 109)

07 04 24 08  LMP  Houston, Apollo 7. Over.

07 04 24 11  CC  Go ahead, Apollo 7.

07 04 24 13  LMP  Okay. I'd like to give you a status report of
the remaining film we have on board.

07 04 24 19  CC  Okay. Go ahead.

07 04 24 21  LMP  First, the 70mm Pan-X: we have 121 frames re-
main; 80368, 20 frames; 80121, 48 frames.
For the 16mm on the 368, there is 2 and 1/3 maga-
zines; on the 168, there is four magazines. Over.

07 04 24 53  CC  Copy that, Walt.

07 04 25 10  LMP  I am standing by for -

07 04 25 20  CC  We'll be back with you in a minute on that primary
evap.

07 04 26 34  CC  Walt, we'll get back to you at Hawaii on the
primary evaporator.

07 04 26 41  LMP  Roger.

07 04 31 08  CC  Apollo 7, Houston. We are about to lose you at
Guam; Hawaii at 40.

07 04 31 11  LMP  Roger, Jack.

HAWAII (REV 109)

07 04 40 43  CC  Apollo 7, Houston through Hawaii.
Roger, Jack.

Roger. Walt, I have your block data number 19.

Houston, Apollo 7. Do you read?

Roger, 7. We've got your block data. Are you ready to copy?

Ready to copy. Go. I'm loaded with blocks now.

Roger. 111 dash 3 Alfa plus 295 plus 1389 175
plus 17 plus 19 2808, 112 dash Charlie plus 195
plus 1520 177 plus 00 plus 44 2680, 113 dash Alfa
Charlie minus 025 minus 0090 177 plus 42 plus 42
5628, 114 dash Alfa Charlie plus 025 minus 0239
170 plus 14 plus 47 5297, 115 dash Alfa Charlie
plus 122 minus 0310 180 plus 48 plus 41 4637,
116 dash 2 Alfa plus 243 minus 0269 182 plus 26
plus 21 3648. End.

Forgot 164. Okay. Readback follows: 111 dash
3 Alfa plus 205 plus 1389 175 plus 17 plus 19
2808, 112 dash 3 Charlie plus 195 plus 1520 177
plus 00 plus 44 2680, 113 dash Alfa Charlie minus
025 minus 0090 177 plus 42 plus 42 5628, 114 dash
Alfa Charlie plus 025 minus 0239 179 plus 14 plus
47 5297, 115 dash Alfa Charlie 122 minus 0310 180
plus 48 plus 41 4637, 116 dash 2 Alfa plus 243
minus 0269 182 plus 26 plus 21 3648. Over.

Roger. On the second block, Walt, that's 112
dash Charlie Charlie.
Roger. 112 dash Charlie Charlie, and tell John Llewellyn that I've got a whole book full of unused blocks here now.

Copy that. Okay.

HUNTSVILLE (REV 109)

Apollo 7, Houston.

Go ahead, Jack.

Okay. Walt, you're pretty weak, but on your question on the primary evaporator: we would like to return the primary evaporator to AUTO.

Going to AUTO now. Shall I bring it into operation as we've been doing before? I'll go ahead and bring it on the line as we have been.

Okay. Walt, if you'll just place that primary evaporator on AUTO, it'll cycle by itself, and we're expecting a cycle sometime tonight.

Well, it's liable to also dry up again sometime tonight. If that's okay with you, I can go ahead and bring it on down, but okay going to AUTO.

Roger. Copy.

And, Walt, we've been doing some discussion down here on a possible manual reservicing procedure for the secondary evaporator in the event it dries out. We've run some tests and have come up with a procedure if you want to copy it.
07 04 48 05 LMP  Is this something that somebody's dreamed up after all these months? I've been told that you cannot reservice the secondary evaporator.

07 04 48 13 CC  That is correct, and we've come up with a procedure to do it.

07 04 48 19 LMP  I don't know how everybody gets so smart in one week's time, but I'll go ahead and copy it. How long is it?

07 04 48 24 CC  Oh, four steps.

07 04 48 26 LMP  Very long steps?

07 04 48 28 CC  No, real short.

07 04 48 30 LMP  Hit me with it.

07 04 48 32 CC  Okay. You want to turn the evaporator water control switch secondary to AUTO.

07 04 48 41 LMP  That's where it is anyway, isn't it?

07 04 48 43 CC  Roger. Then you want to turn your secondary coolant loop EVAP switch to EVAP for 5 plus or minus 1 seconds, then RESET for 10 plus or minus 1 seconds.

07 04 40 31 CC  Roger. You copy that, Walt?

07 04 40 34 LMP  I got evaporator water control secondary to AUTO which is where it normally is when it's running. Go to the EVAP position for 5 seconds and RESET for 10 seconds - I assume immediately afterwards, is that correct?
Affirmative. 5 plus or minus 1 seconds, then
RESET for plus or minus 1 second. Okay. Then
repeat this - this step above for 40 - for a
recommended 40 cycles.

Forty times I do that, right?

Roger. Forty cycles is the desired, but 20 cycles
is the minimum number needed to bring the evapor-
ator on the line. It'll give you three-tenths of
a pound, 20 cycles will.

Okay. But I'd just like to go on record here as
saying that people that dream up procedures like
this after you lift off have somehow or another
been dropping the ball for the last 3 years if
they have a procedure where you can reservice.
It looks kind of Mickey Mouse, but I'll stand by
to do it if I have to.

Okay. We just wanted to get you thinking about
it in case you needed it.

What? Did you read me then?

Affirmative, Walt.

Okay. I'll do this Mickey Mouse procedure if
necessary, but not until LOS. We'll be saying
a lot further in the flight plan.

Okay. We've got it. We're about to lose you
over the Huntsville, Walt. We'll pick you up at
Tananarive at 32, 173 plus 32.
<table>
<thead>
<tr>
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<th>Text</th>
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<tbody>
<tr>
<td>07 05 33 11</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive.</td>
</tr>
<tr>
<td>07 05 33 17</td>
<td>CDR</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>07 05 36 44</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>07 05 41 22</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute and a half to LOS Tananarive; Mercury at 57.</td>
</tr>
</tbody>
</table>

**MERCURY (REV 110)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 05 58 28</td>
<td>CC</td>
<td>Apollo 7, Houston through Mercury.</td>
</tr>
<tr>
<td>07 05 58 33</td>
<td>CDR</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>07 05 58 34</td>
<td>CC</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>07 05 58 38</td>
<td>CDR</td>
<td>Ron, would you check my BIMED signal while I'm on, please?</td>
</tr>
<tr>
<td>07 05 58 45</td>
<td>CC</td>
<td>Roger. Coming through good.</td>
</tr>
<tr>
<td>07 05 58 50</td>
<td>CDR</td>
<td>Thanks. Would you - check the oxygen, will you?</td>
</tr>
<tr>
<td>07 05 58 56</td>
<td>CC</td>
<td>Roger. O₂ manifold pressure now 106.</td>
</tr>
<tr>
<td>07 05 59 00</td>
<td>CDR</td>
<td>106. Roger.</td>
</tr>
<tr>
<td>07 05 59 03</td>
<td>CC</td>
<td>Now it's 102.</td>
</tr>
<tr>
<td>07 05 59 05</td>
<td>CDR</td>
<td>102. We're at 80.</td>
</tr>
<tr>
<td>07 06 00 08</td>
<td>CC</td>
<td>Roger. Apollo 7, Houston.</td>
</tr>
<tr>
<td>07 06 00 12</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>07 06 00 14</td>
<td>CC</td>
<td>Roger. You might tell Walt that his spark plug changer has some information here when he gets a chance to troubleshoot his BIMED.</td>
</tr>
<tr>
<td>07 06 00 24</td>
<td>CDR</td>
<td>Roger. He's got a good chance because he's got his hood open now.</td>
</tr>
</tbody>
</table>
Roger. We'd like to confirm that the yellow lead is connected to the blue signal conditioner at this time.

Okay. It's not hooked up right now. Yellow lead to blue conditioner. And Donn Eisele has the same break I have. It's identical.

Roger.

So he'll rig it up the same way I am.

That's fine.

If Walt has the yellow lead to the blue conditioner, we would like to disconnect the side sensors at the pin connectors and then connect the yellow lead to the upper and lower chest sensors.

Okay. And I just disconnect the ... or whatever the heck they are - auxiliary.

That's affirmative; disconnect the auxiliary.

Okay. I'll have him remove those sensors then as long as he is going to disconnect them.

Affirmative. And he can also --

Just keep the two externals and run them to the yellow pin to the blue conditioner.

That's affirmative; yes.

Okay. Will do. We're changing our skivvies tonight.

Roger.
Apollo 7, Houston. Thirty seconds LOS; Hawaii at 16.

Roger. We'll ... your spark plugs.

Roger.

HAWAII (REV 110)

Apollo 7, Houston through Hawaii.

Roger. Loud and clear.

Roger.

Apollo 7, Houston.

Go ahead.

Roger. Is the urine dump heater still in main A?

That's affirmative.

Roger. And which suit circuit accumulator is now in operation?

Number 1 - wait a minute; stand by. Number 1, yes.

Roger.

We'll leave that urine dump heater where it is; it's been working like a charm.

Roger. It kind of bounces up and down here on the temperature, and we're just watching it; we're curious which one has been working.

A only.

Roger.

Any new news back that way?

Roger. I've got a man working on it now.
07 06 18 44  CDR  Okay.
07 06 19 57  CC  Apollo 7, Houston. Request O_2 tank 2 fan cycle on for 5 minutes, then off.
07 06 20 04  CDR  Okay.
07 06 20 44  CDR  LMP's anxious to try his new fix. We'll give it to you, give you the data.
07 06 20 52  CC  Say it again.
07 06 20 54  CDR  Roger. Walt's hooked up. You can try him for an EKG, or whatever it is.
07 06 20 58  CC  Roger. We're looking at it.
07 06 21 26  CDR  Ron, ask John if we can move the upper sternal down about an inch to relieve the strain on the lead.
07 06 21 33  CC  That's affirmative.
07 06 21 35  CDR  Okay. What's the reading we're sending you, then?
07 06 21 37  CC  Roger. It's not looking very good yet. We'll check it again at Ascension.
07 06 21 42  CDR  Okay. That's the two sternal leads on the yellow pin connector to the blue signal conditioner.
07 06 21 51  CC  Roger.
07 06 21 53  CDR  Okay.
07 06 22 14  CC  LOS. We'll pick you up at Ascension at 57.
07 06 22 18  CDR  Roger. Fifty-seven, Ascension.

ASCENSION (REV 111)
07 06 57 10  CC  Apollo 7, Houston through Ascension. Standing by.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Station</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 07 12 00</td>
<td>CC</td>
<td></td>
<td>Apollo 7, Houston, Tananarive. Low elevation pass.</td>
</tr>
<tr>
<td>07 07 12 06</td>
<td>CDR</td>
<td></td>
<td>Roger. Go ahead.</td>
</tr>
<tr>
<td>07 07 12 07</td>
<td>CC</td>
<td></td>
<td>Roger. Read you loud and clear.</td>
</tr>
<tr>
<td>07 07 12 10</td>
<td>CDR</td>
<td></td>
<td>...</td>
</tr>
<tr>
<td>07 07 12 20</td>
<td>CC</td>
<td></td>
<td>And that didn't come through.</td>
</tr>
<tr>
<td>07 07 12 24</td>
<td>CDR</td>
<td></td>
<td>Roger. ... Did you have any news for us? We heard you at Ascension, but you couldn't hear us.</td>
</tr>
<tr>
<td>07 07 12 33</td>
<td>CC</td>
<td></td>
<td>Roger. Copy that.</td>
</tr>
<tr>
<td>07 07 12 53</td>
<td>LMP</td>
<td></td>
<td>Ron, do you read us?</td>
</tr>
<tr>
<td>07 07 12 55</td>
<td>CC</td>
<td></td>
<td>Affirmative.</td>
</tr>
<tr>
<td>07 07 12 57</td>
<td>LMP</td>
<td></td>
<td>Hey, Ron, can you give me a readout on hydrogen tank 1 quantity and hydrogen tank 2 quantity?</td>
</tr>
<tr>
<td>07 07 13 03</td>
<td>CC</td>
<td></td>
<td>Roger. H₂ tank 1 37.4, H₂ tank number 2 36.8.</td>
</tr>
<tr>
<td>07 07 13 16</td>
<td>LMP</td>
<td></td>
<td>Come to think of it, give Donn a call ...</td>
</tr>
<tr>
<td>07 07 13 26</td>
<td>CC</td>
<td></td>
<td>Apollo 7, Houston. Say again.</td>
</tr>
<tr>
<td>07 07 13 30</td>
<td>LMP</td>
<td></td>
<td>Give Donn a call when they've balanced and have him turn both heaters on the hydrogen tanks to AUTO.</td>
</tr>
<tr>
<td>07 07 14 02</td>
<td>CC</td>
<td></td>
<td>Thirty seconds LOS; we will call Donn when they get balanced. Mercury at 33.</td>
</tr>
<tr>
<td>07 07 14 11</td>
<td>CDR</td>
<td></td>
<td>Roger.</td>
</tr>
</tbody>
</table>

**TANANARIVE (REV 111)**

**MERCURY (REV 111)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Station</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 07 36 01</td>
<td>CC</td>
<td></td>
<td>Apollo 7, Houston through Mercury. Standing by.</td>
</tr>
<tr>
<td>07 07 36 05</td>
<td>CMP</td>
<td></td>
<td>Roger.</td>
</tr>
</tbody>
</table>
07 07 36 06 CC Roger. Loud and clear.
07 07 38 26 CMP Houston, Apollo 7.
07 07 38 28 CC Houston. Go.
07 07 38 30 CMP Roger. This is the CMP up now --
07 07 38 32 CC Roger. Good morning.
07 07 38 33 CMP -- and I'd like to give you a little status report.
07 07 38 35 CC Roger.
07 07 38 37 CMP Okay. First of all, starting last night, when
I went to sleep about 168 hours, log me 30 clicks
of water, two aspirin, and one Lomotil.
07 07 38 49 CC Roger.
07 07 38 53 CMP The LMP wants to add 30 clicks of water and wishes
to announce that he is now pure in sleep with clean
skivvies on.
07 07 39 01 CC Beautiful.
07 07 39 05 CMP The CDR is -- the CDR is recording 20 clicks of
water, and he wished to announce that he has his
backup backups on also.
07 07 39 27 CC Roger.
07 07 39 58 CC About 1 minute LOS; Redstone at 05.
07 07 40 30 CMP Hey, Ron, you got any hot news for us?
07 07 40 33 CC Roger. The paper said your SPS burn was the
mightiest maneuver ever made by a manned space-
craft.
07 07 40 40 CMP That's right.
07 07 40 42 CC Yes. The stock market is at its highest level
since February of '66.
07 08 06 32  CC  Apollo 7, Houston through Redstone.
07 08 06 35  CMP  Roger, Houston.
07 08 06 37  CC  Roger. Loud and clear. Say, Donn, on all of our discussion on the DELTA-V meter there today, your EMS counter, we never did get a residual EMS DELTA-V after the burn today. Do you happen to recall what that was?
07 08 07 02  CMP  I'm sorry. Sure don't, Ron. We couldn't see it very well; it was so bright in here that those numerics didn't show up very well.
07 08 07 13  CC  Roger.
07 08 08 44  CMP  Hey, Ron. Could you give me an orbital backup date please and also find out how much difference the period is between our orbit and the one that was portrayed on our orbit map?
07 08 08 59  CC  Wilco, Donn. Apollo 7, Houston. Opposite omni.
07 08 11 30  CC  Apollo 7, Houston. I have a map update for you.
07 08 11 35  CMP  Roger. Go ahead.
07 08 11 37  CC  Roger. REV 111, GET 175 plus 15 plus 00, longitude 41.4 east.
07 08 12 01  CMP  Okay. 175 plus 15 plus zeroes and then 414 east?
07 08 12 07  CC  Affirmative. 41.48 east.
07 08 12 08  CMP  Okay. Did you find out about the orbit period?
07 08 12 19  CC  Roger. We're working on it. The period is 90 something—let me look it up here— the period is 90 plus 42 now.
<table>
<thead>
<tr>
<th>Time</th>
<th>Caller</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 08 12 34</td>
<td>CMP</td>
<td>Period is 90 plus 42.</td>
</tr>
<tr>
<td>07 08 12 37</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>07 08 12 39</td>
<td>CMP</td>
<td>I see. I don't know what it is on this map. I guess I can figure it out.</td>
</tr>
<tr>
<td>07 08 12 48</td>
<td>CC</td>
<td>We'll get the information for you. And, Donn, did you get the fix on the BIGMED harness that we passed up for the rest of the guys?</td>
</tr>
<tr>
<td>07 08 12 58</td>
<td>CMP</td>
<td>Oh, yes. To switch the plug to the other side.</td>
</tr>
<tr>
<td>07 08 13 02</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>07 08 13 04</td>
<td>CMP</td>
<td>Yes. I did get that; I haven't done it yet. I will in a little bit.</td>
</tr>
<tr>
<td>07 08 13 07</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 08 13 40</td>
<td>CC</td>
<td>Apollo 7, Houston. Thirty seconds LOS; Ascension at 31.</td>
</tr>
<tr>
<td>07 08 13 45</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 08 13 56</td>
<td>CC</td>
<td>And - 7, Houston - your map is a 90-minute period.</td>
</tr>
<tr>
<td>07 08 14 03</td>
<td>CMP</td>
<td>Say again.</td>
</tr>
<tr>
<td>07 08 14 04</td>
<td>CC</td>
<td>Ninety plus 00 period on your map.</td>
</tr>
<tr>
<td>07 08 14 08</td>
<td>CMP</td>
<td>Roger. I understand. Thank you.</td>
</tr>
<tr>
<td>07 08 32 07</td>
<td>CC</td>
<td>ASCENSION (REV 112)</td>
</tr>
<tr>
<td>07 08 32 12</td>
<td>CMP</td>
<td>Apollo 7, Houston through Ascension. Standing by.</td>
</tr>
<tr>
<td>07 08 32 14</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>07 08 32 45</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 08 32 48</td>
<td>CC</td>
<td>Ron, are the skies pretty in Houston?</td>
</tr>
<tr>
<td>07 08 32 52</td>
<td>CMP</td>
<td>How's the weather there?</td>
</tr>
</tbody>
</table>
Roger. The weather is beautiful.
I just looked outside. There's a beautiful planet up here over Scorpio. I don't know which one it is, but it sure is bright.
Roger.
May be Jupiter.
We'll check and let you know.
7, Houston. The good doctors say, "thank you."
That's what he wanted, right?
Affirmative.
Apollo 7, Houston. Opposite omni.
Roger.
Houston, Apollo 7.
Houston. Go.
Roger. A couple of days ago we did a P23 star-to-lunar landmark exercise. I just wonder if the data got down to the ground and if they were happy with it? We only got a chance to do one or two, and I didn't know how they came out.
Roger. We'll check it.
Thank you.
Ron, we were going to get the SCS and G&M control mode checks, and Donn's awake now. We've got a couple of minutes. It might be worthwhile to try and get that one done. Find out what he has completed from his log.
07 08 39 32  CC  Apollo 7, Houston.
07 08 39 36  CMP  Go.
07 08 39 37  CC  Roger. Have you had a --
07 08 39 38  CMP  Go ahead, Ron.
07 08 39 39  CC  Have you had a chance to give us a rundown on
the SCS and G&M control modes, how many you have
completed?
07 08 39 48  CMP  Yes; stand by. That's right. I owe you that
from yesterday.
07 08 39 51  CC  Roger.
07 08 40 47  CC  7, Houston. About 1 minute to LOS. Venus is
fairly close to Scorpio at this time.
07 08 40 53  CMP  Oh, it's Venus.
07 08 40 55  CC  Roger.
07 08 40 56  CMP  Okay. That's why it's bright.
07 08 41 03  CMP  Ron, I'll give you this rundown when we come
over the next station, okay?
07 08 41 07  CC  Roger.
07 08 41 12  CC  It will be Mercury at 09.
07 08 41 15  CMP  Roger.

MERCURY (REV 112)
07 09 10 04  CC  Apollo 7, Houston, Mercury. Standing by.
07 09 10 10  CMP  Roger. Houston, Apollo 7.
07 09 10 13  CC  Roger. Loud and clear.
07 09 10 34  CMP  Ron, I'm looking over this scorecard here on
attitude control modes, and we've got them all
checked off except for some of the various rates, particularly the high rates in automatic maneuver for G\&N.

Roger.

If you like, I can go down the list for you. You want the details, or you just want a total scorecard?

If you have time, we would like to go down the list. We're trying to figure out how much RCS fuel we need to allocate for the rest of them.

Okay. Go down G\&N control modes. Wally has checked off - or one of us did - MAX deadband attitude holds for 20 to 30 minutes. I believe we did that in possibly P20 during rendezvous. Also, the minimum deadband we used during SPS burns which is attitude hold G\&N.

Roger.

Automatic maneuvers; we do those. We do an automatic trend maneuver for every burn. It also took automatic maneuvers in P20 during rendezvous.

Roger.

Manual rate commands have been used to trim the roll angles at, you know, just prior to the last AUTO trend for a burn, and we may have used it at other places. I can't recall offhand. I think
we did during such things as that P23 tracking
where we went to attitude hold for a little while
and then DAP.
Roger.
We used the minimum impulse controller for that -
the sextant calibration and for P23. We used RCS
translation control for the rendezvous, and it
was a TPI burn. We used a CMC free mode in free
axis during the sextant calibration. We made au-
tomatic maneuvers at 0.5 and 0.2 degrees per sec-
ond. We've also made manual maneuvers at those
rates. Usually, it takes place during the pre-
burn cycle, say 5 to 10 minutes before the burn
when we're maneuvering the attitude or holding
attitude.
Roger.
Okay. On the SPS: during the SPS cold soak we,
of course, did the MAX deadband, that was the
4-degree deadband with low rates. We used mini-
mum deadband low rate during rendezvous for at-
titude hold during braking and line of sight
corrections. We used RATE COMMAND at low rate
during the same period of time for during ren-
dezvous. We used minimum impulse and ACCEL COM-
MAND right along. That's our standard maneuver
modes; it's of this - it's higher than any other
rate. Translation control: we've done that through one SPS burn and for the initial separation maneuver from the S-IVB. Wally, just before we powered down last night, set the manual to RET mode and said it was satisfactory. We have not done RATE COMMAND HIGH rate, but we'll do so during maneuvers to entry altitude following separation. We also used the maximum deadband 8 degree during the SPS cold soak. And he's got here "minimum deadband high rate during SPS cold soak."

Roger. Looks good, then.

I don't know what all they need to know in way of data down there, but as far as we're concerned, we've run it out pretty thoroughly, and very pleased with the various modes, as far as handling qualities. Wally could tell you some more on those, too. We're a little curious as to the fuel consumption on some of them. I think some modes - particularly with the kind of deadband, they're using a little more than we thought they might based on our simulations before we flew.

Roger.

GUAM (REV 112)

Apollo 7, Houston.

Roger. Go.
Roger. Recommend $H_2$ heaters to AUTO, both tanks.

07 09 18 16 CMP $H_2$ heaters to AUTO, both tanks. Okay. Evidently, they're balanced up now, right?

07 09 18 22 CC Roger.

07 09 18 24 CMP All right. Hey, Ron, can you get the $H_2$ tank quantities that you have down there?

07 09 18 41 CC Roger. $H_2$ tank 1 36.58, tank 2 36.38.

07 09 18 54 CMP Roger. 36.58 and 36.38.

07 09 18 58 CC Roger.

07 09 20 46 CC Apollo 7, Houston. One minute - or 30 seconds to LOS; Redstone at 40.

07 09 20 52 CMP Roger. Be waiting.

07 09 20 54 CC Roger. Been curious to know, do you notice much of the deviation from perigee to apogee in this orbit?

07 09 21 01 CMP I haven't picked it up yet. I haven't been looking out the window that much, but should expect to see some.

07 09 21 08 CC Roger.

REDSTONE (REV 112)

07 09 40 58 CC Apollo 7, Houston through Redstone. Standing by.

07 09 43 17 CC Apollo 7, Houston through Redstone. Standing by.

07 09 43 22 CMP Roger. Ron, do you read?

07 09 43 23 CC Roger. Read you now.

07 09 43 25 CMP Okay.
07 09 46 43 CC Apollo 7, Houston. I have some flight plan updates, whenever you're ready to copy.

07 09 46 48 CMP Okay. Ron, stand by a minute.

07 09 46 57 CC 7, Houston. Stand by on those flight plans. We'll catch them later.

07 09 47 04 CMP All right.

07 09 49 22 CC Apollo 7, Houston. One minute LOS; Ascension at 07, and it looks like you're exercising or something.

07 09 49 33 CMP Yes. How'd you guess?

07 09 49 38 CC The good surgeons came through.

ASCENSION (REV 113)

07 10 07 25 CC Apollo 7, Houston through Ascension. Standing by.

07 10 08 50 CC Apollo 7, Houston through Ascension. Standing by.

07 10 08 55 CMP Roger. Houston, Apollo 7. How do you read?

07 10 08 57 CC Roger. Loud and clear, Donn.

07 10 09 00 CMP Right.

07 10 11 47 CC Apollo 7, Houston. Opposite omni.

07 10 12 02 CMP Roger. Stand by, Ron.

07 10 12 05 CC Roger.

07 10 13 29 CC 7, Houston.

07 10 13 34 CMP Roger. Go.

07 10 13 37 CC Roger. Your one and only is currently observing your progress across the plot board.

07 10 13 44 CMP Oh, she is?

07 10 13 46 CC Roger.
07 10 13 53 CMP What time is it back there anyway, about eight o'clock?
07 10 13 57 CC Affirmative. 08:15.
07 10 14 00 CMP Oh, yes.
07 10 14 12 CMP Tell her I might drop in in a week or so.
07 10 14 16 CC Roger.
07 10 17 25 CC Apollo 7, Houston. Thirty seconds LOS; Mercury at 45.
07 10 17 32 CMP Roger. I understand.
07 10 17 34 CC Roger.
07 10 46 53 CC Apollo 7, Houston through Mercury.
07 10 46 57 CMP Roger. Houston, Apollo 7.
07 10 47 00 CC Roger. Loud and clear.
07 10 47 04 CC Donn, we'd like to power up the S/C over Mercury or Guam and then power it down again over Redstone.
07 10 47 12 CMP Okay. You want me to do that now?
07 10 47 17 CC Affirmative.
07 10 47 19 CMP All right, going.
07 10 47 19 CMP Say, Ron, would you speak to the visitor you men- tioned last pass? Did you take care of that lit- tle detail for me?
07 10 48 24 CC Affirmative.
07 10 48 25 CMP All right, thank you.
07 10 48 25 GUAM (REV 113)
07 10 52 18 CC Apollo 7, Houston.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 10 52 22</td>
<td>CMP</td>
<td>Houston, Apollo 7. Go.</td>
</tr>
<tr>
<td>07 10 52 24</td>
<td>CC</td>
<td>Roger. Your state vectors have been integrated forward, and you can power down at your convenience.</td>
</tr>
<tr>
<td>07 10 52 33</td>
<td>CMP</td>
<td>Okay. Roger.</td>
</tr>
<tr>
<td>07 10 53 19</td>
<td>CC</td>
<td>Apollo 7, Houston. Opposite omni.</td>
</tr>
<tr>
<td>07 10 53 27</td>
<td>CMP</td>
<td>We have it.</td>
</tr>
<tr>
<td>07 10 53 29</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 10 57 25</td>
<td>CC</td>
<td>Apollo 7, Houston. Thirty seconds LOS; Redstone at 16.</td>
</tr>
<tr>
<td>07 10 57 32</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 11 17 49</td>
<td>CC</td>
<td>Apollo 7, Houston through Redstone.</td>
</tr>
<tr>
<td>07 11 17 54</td>
<td>CMP</td>
<td>Roger. Houston, Apollo 7.</td>
</tr>
<tr>
<td>07 11 17 56</td>
<td>CC</td>
<td>Roger. I have your flight plan updates if you are ready to copy.</td>
</tr>
<tr>
<td>07 11 18 01</td>
<td>CMP</td>
<td>All right. Stand by one.</td>
</tr>
<tr>
<td>07 11 18 08</td>
<td>CMP</td>
<td>Roger. Go ahead, Ron.</td>
</tr>
<tr>
<td>07 11 18 10</td>
<td>CC</td>
<td>Roger. At 183 plus 00, &quot;Oxygen fuel cell purge.&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>At 186 plus 15, &quot;Canary USB upvoice backup same as 70 plus 25.&quot;</td>
</tr>
<tr>
<td>07 11 18 48</td>
<td>CMP</td>
<td>Will you say it again?</td>
</tr>
<tr>
<td>07 11 18 54</td>
<td>CC</td>
<td>Roger. At 186 plus 15, add &quot;Canary USB upvoice backup same as 70 plus 25.&quot;</td>
</tr>
<tr>
<td>07 11 19 22</td>
<td>CMP</td>
<td>Roger. Ron, I read it as the same as we did at 70 hours and 25 minutes.</td>
</tr>
</tbody>
</table>
07 11 19 26 CC Affirmative.
07 11 19 33 CC At 187 plus 10 delete "CMC power up."
07 11 19 52 CMF Roger. Delete power up at ...
07 11 19 59 CC At 189 add "GDS USB emergency key test same as 98 plus 35."
07 11 20 35 CMF Okay.
07 11 20 39 CC At 189 plus 30, "Prepare TV." At 190 plus 40 to 190 plus 51, "TV pass."
07 11 21 09 CMF Roger. Do you have the TV turnon time?
07 11 21 21 CC Roger. TV turnon time 190 plus 38.
07 11 21 33 CMF Roger.
07 11 21 38 CC Perform all other activities as scheduled.
07 11 21 43 CMF Okay. We've got it.
07 11 21 45 CC Roger. And you might note that you want to move everything up about 5 minutes to match the real-time trajectory.
07 11 21 56 CMF Yes, I see that. Okay. We can do that.
07 11 22 00 CC Roger.
07 11 22 03 CC And, Donn, request pyro batt A and B readouts, and I have some battery ampere-hours.
07 11 22 14 CMF Okay. While the guys are checking, how about taking a look at O₂ tank 2 pressure? It's a little low on our meter up here.
07 11 22 25 CC Roger. O₂ tank 2: we're reading 865.
07 11 22 31 CMF Okay. I guess it's our meter.
07 11 22 38 CC Roger. Your heaters are cut in now, too, Donn.
07 11 22 44  CMP  Roger.
07 11 23 05  CMP  My pyro batt A is 36.9.
07 11 23 09  CC  Roger.
07 11 23 10  CMP  And pyro batt B is 36.9.
07 11 23 14  CC  Roger.
07 11 23 20  CC  For batt A you have 29.3, batt B 26.9, and batt Charlie 39.5.
07 11 23 53  CMP  Roger. Would you read those again? I was off the couch pulling the circuit breakers.
07 11 24 17  CMP  Roger. A and B are a little low, aren't they?
07 11 24 22  CC  They're coming down now on schedule, yes.
07 11 24 25  CMP  Oh.
07 11 25 57  CC  Apollo 7, Houston. One minute LOS; Ascension 44.
07 11 26 03  LMP  Roger.

ASCENSION (REV 114)
07 11 45 31  CC  Apollo 7, Houston through Ascension. Standing by.
07 11 46 28  CC  Apollo 7, Houston. Look's like we got some more gold medals today.
07 11 46 34  CMP  Outstanding. Who were they?
07 11 46 40  CC  Roger. 400-meter runner Lee Evans and long jumper Bob Beaman plus Sue Remick in the women's spring-board. Each picked up a gold medal. Evans, by the way --
07 11 47 00  CMP  Very good.
<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 11 47 01</td>
<td>CC</td>
<td>Evans, by the way, of San Jose, California: he led a one, two, three sweep in his 400-meter run.</td>
</tr>
<tr>
<td>07 11 47 10</td>
<td>CMP</td>
<td>Who did that?</td>
</tr>
<tr>
<td>07 11 47 12</td>
<td>CC</td>
<td>Lee Evans. He got first; two other gents from the United States got second and third.</td>
</tr>
<tr>
<td>07 11 47 20</td>
<td>CMP</td>
<td>All in the 400 meters?</td>
</tr>
<tr>
<td>07 11 47 21</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>07 11 47 23</td>
<td>CMP</td>
<td>Well, that's pretty good. Any relation to you?</td>
</tr>
<tr>
<td>07 11 47 30</td>
<td>CC</td>
<td>No, but I would like it to be, though.</td>
</tr>
<tr>
<td>07 11 47 41</td>
<td>CMP</td>
<td>Say, Ron, I was looking at this flight plan at this TV business. It doesn't look to me like that's too good a time to do it because that's right in the middle of the sleep period. I was wondering if it would be all right to do it earlier; they don't have much going on today except this secondary coolant test. I see. What you're saying is you like to be on TV. No, I don't care to be on TV, but I don't care to have those guys walking around while I'm trying to sleep either. No, we'll check into it and let you know later. I think what it is, they're trying to set this up so it ties in with somebody's TV show. Seems to me you could move it back or move it ahead an hour or two and then tape it, or do you want to do that? I don't know about that; I will check into it.</td>
</tr>
</tbody>
</table>
That's kind of an awkward time for us because that's when we're usually changing shifts and so forth.

Roger. We'll take a look at it; I think it may have something to do with that secondary loop test.

I believe you're right. The secondary loop test will still go along all right while that's going on. Start to check into it anyway and see what they say.

Will do.

Thank you.

Apollo 7, Houston. Thirty seconds LOS; Guam at 28.

Roger. Guam at 28.

Apollo 7, Houston through Guam.

Apollo 7, Houston.

Roger. Go.

Roger. Donn, looks like we're going to move the TV one orbit before. I can change your times if you're ready to copy.

Go ahead.

7, Houston. Did you say go ahead?

7, 30 seconds LOS. I'll catch you at Redstone at 52.

Okay. Fine. I'll talk to you then.
REDSTONE (REV 11h)

07 12 52 30 CC Apollo 7, Houston, Redstone.
07 12 52 34 CDR Roger. Houston, Apollo 7.
07 12 52 37 CC Roger. I have block data number 20 and some flight plan updates.
07 12 52 43 CMP Okay. Before that, I've got a little problem here with my BIOMED. One of the signal conditioners here is getting quite hot, so I took the whole rig off and stowed it. I just thought I better pass that along and see if the Flight Surgeon has got any ideas on what he wants me to do.
07 12 53 00 CC Roger. Which one got hot, your black one or the blue one?
07 12 53 06 CMP I don't know much about them; the one on the right - the farthest to the right.
07 12 53 18 CC Roger -
07 12 53 38 CC Roger. Donn, the one farthest to the right is the power supply.
07 12 53 44 CMP Roger. I don't care which one it is. I'm not going to wear it anymore.
07 12 53 50 CC Roger.
07 12 54 01 CMP Sounds like I triggered the ... notwithstanding all the sweet talk we got about how there weren't any.
07 12 54 11 CC I understand.
07 12 54 17 CMP Roger.
07 12 54 20 CMP Okay. I'll get this format, and we'll go over the update. Why don't you give me that flight plan part first on the TV?

07 12 54 25 CC Okay. Everything's the same if you'll check your emergency key test.

07 12 54 33 CC We'll do it on —

07 12 54 35 CMP Say again.

07 12 54 36 CC On the emergency key test.

07 12 54 38 CMP Yes.

07 12 54 40 CC We'll do it at 190 plus 35.

07 12 54 45 CMP Okay.

07 12 54 47 CC Prepare TV at 188 plus 00. TV turn on at 189 plus 02. TV pass 189 plus 04 to 189 plus 15.

07 12 55 34 CMP Okay. I got TV ON at 189 02, TV pass from 04 to 15, and you moved the USB key emergency key test over to 190 35.

07 12 55 47 CC Roger.

07 12 56 03 CMP Okay.

07 12 56 10 CC Now I have block data when you're ready to copy.

07 12 56 18 CMP Go ahead with the block data, Ron.

07 12 56 20 CC Roger. 117 dash 1 Charlie plus 224 minus 0552 183 plus 54 plus 59 3833 118 dash 1 Alfa plus 277 minus 0600 185 plus 31 plus 45 3310, 119 dash 1 Bravo plus 303 minus 0600 187 plus 12 plus 18 2973, 120 dash 1 Alfa plus 282 minus 0702 188 plus 54 plus 08 2841, 121 dash 1 Alfa plus 225
Page 837

minus 0630 190 plus 35 plus 19 3477, 122 minus 4 alpha plus 298 minus 1620 193 plus 09 plus 09 3088. Houston. Over.

Apollo 7, Houston. Opposite omni.

Roger. I've got 117 plus 1 Charlie plus 224 minus 0552 183 54 59 3833, 118 dash 1 Alpha plus 277 minus 0600 31 45 3310, 119 dash 1 Bravo plus 303 minus 0600 187 1218 2973, 120 dash 1 Alpha plus 282 minus 0602 188 5408 2841, 121 dash 1 Alpha plus 225 minus 0630 190 3519 3477, 122 dash 4 Alpha plus 298 minus 1620 193 09 09 3088.

Apollo 7, Houston. Headback correct.

Ron, I've got one other flight plan question for you.

Roger. Go.

Roger. In our checklist, there's a procedure called the GEC and/or IMU backup alignment, and it's identically the same procedure for either or both preferences. I noticed in the flight plan we've got two separate tests there which apparently are the same thing. I wonder if you could clarify that? There's one on 262 and one on 273.

Roger. We'll investigate and advise.

Okay.

And on your P23, we have good data. We will be assessing it tomorrow and let you know.
07 13 00 54  CMP   You say you did get good data?
07 13 00 56  CC    Affirmative.
07 13 00 57  CMP   Well, fine.
07 13 02 19  CC    Apollo 7, Houston. One minute LOS; Canaries at 23.
07 13 02 24  CMP   Roger. Understand. Canaries at 23.
               CANARY (REV 115)
07 13 24 16  CC    Apollo 7, Houston through Canary. Standing by.
07 13 24 23  CMP   Roger.
07 13 24 26  CC    Roger. Loud and clear.
07 13 24 28  CMP   Roger.
07 13 25 33  CC    Apollo 7, Houston. Opposite omni.
07 13 25 37  CMP   Roger.
07 13 31 39  CC    Apollo 7, Houston. Thirty seconds to LOS; Honeysuckle at 11. That'll be at USB only.
07 13 31 47  CMP   Okay. Eleven for Honeysuckle, and I'll turn it up.
07 13 32 01  CC    7, Houston. My mistake. Honeysuckle is not up this pass; it will be Redstone at 27.
07 13 32 07  CMP   Okay. Redstone, 27. Look for you then.
07 13 32 13  CC    Roger. We're going to be in a quandry in the morning. You're supposed to pass right over Houston at the same time you're shooting down the TV pictures, so we'll probably look at the TV instead of look for the spacecraft.
07 13 32 24  CMP   ... get a portable you could watch it outside.
07 13 32 33  CC    Roger.
REDSTONE (REV 115)

<table>
<thead>
<tr>
<th>Time</th>
<th>CC/CMF</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 14 28 15</td>
<td>CC</td>
<td>Apollo 7, Houston through Redstone.</td>
</tr>
<tr>
<td>07 14 28 20</td>
<td>CMF</td>
<td>Hello, there.</td>
</tr>
<tr>
<td>07 14 28 21</td>
<td>CC</td>
<td>Hi, how are you this evening?</td>
</tr>
<tr>
<td>07 14 28 23</td>
<td>CMF</td>
<td>Just fine, Bill. How are you?</td>
</tr>
<tr>
<td>07 14 28 25</td>
<td>CC</td>
<td>Bright-eyed and bushy-tailed.</td>
</tr>
<tr>
<td>07 14 28 28</td>
<td>CMF</td>
<td>Attaboy.</td>
</tr>
<tr>
<td>07 14 30 46</td>
<td>CC</td>
<td>Apollo 7, Houston. I have a T zero time for your secondary coolant loop test.</td>
</tr>
<tr>
<td>07 14 30 57</td>
<td>CMF</td>
<td>Say again, Bill, please.</td>
</tr>
<tr>
<td>07 14 30 59</td>
<td>CC</td>
<td>I have the update time for the secondary coolant loop test.</td>
</tr>
<tr>
<td>07 14 31 04</td>
<td>CMF</td>
<td>Okay. Start time for the test, you mean?</td>
</tr>
<tr>
<td>07 14 31 06</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 14 31 08</td>
<td>CMF</td>
<td>Okay. Go ahead.</td>
</tr>
<tr>
<td>07 14 31 09</td>
<td>CC</td>
<td>It's 183 plus 40.</td>
</tr>
<tr>
<td>07 14 31 21</td>
<td>CMF</td>
<td>Roger. 183 plus 40.</td>
</tr>
<tr>
<td>07 14 31 24</td>
<td>CC</td>
<td>Right, and I've also been reminded to pass on - they said you probably already knew, but that duty cycle entries on the procedure are not appropriate; they're not applicable.</td>
</tr>
<tr>
<td>07 14 31 36</td>
<td>CMF</td>
<td>Understand. The duty cycle entries are not appropriate.</td>
</tr>
<tr>
<td>07 14 31 39</td>
<td>CC</td>
<td>Affirmative.</td>
</tr>
<tr>
<td>07 14 31 40</td>
<td>CMF</td>
<td>Walt says he hopes somebody down there hawkeyes the radiator parameters on - keeping an eye on how they're doing.</td>
</tr>
</tbody>
</table>
07 14 31 48  CC  Right.
07 14 32 04  CMP  Houston, Apollo 7.
07 14 32 06  CC  Go.
07 14 32 07  CMP  Roger. We decided to start calling this thing
the emergency coolant loop rather than secondary,
so from now on, we'll use that term.
07 14 32 16  CC  Right.
07 14 32 19  CMP  That's really what it is.
07 14 32 20  CC  Okay.
07 14 36 54  CC  Apollo 7, Houston.
07 14 36 59  CMP  Roger, Houston.
07 14 37 00  CC  Say, Donn, I have a question about this glitch
on the number 1 ball. We had a reading here
that even with the ORDEAL power switch OFF, the
switch must be in INERTIAL on the ORDEAL panel
to present ORDEAL selection when you switch back
to ball 1. Do you happen to know whether or not
the switch was to INERTIAL on the ORDEAL box when
you had the trouble?
07 14 37 34  CMP  Bill, why don't you wait until Wally gets up
after awhile, and you can discuss that. I wasn't
awake when all that was going on, so I don't know
what really happened.
07 14 37 40  CC  Okay. Disregard.
07 14 37 43  CMP  He's awake. I could relay it to him. I think it
would be easier if you just talked to him later on.
Okay. That'll be fine.

Apollo 7, Houston. One minute LOS Redstone; Antigua at 47.

Roger.

Houston, our morning glass count is 06853.

Say again the number.

06853.

Roger.

Antigua (REV 116)

Apollo 7, Houston through Antigua.

Roger, Houston.

Right. And, Donn, I copied a number just about LOS, and you were just starting to go unreadable.

I copied 06853, and what was the significance of that number?

That was a radiation reading. Walt tells me we haven't been calling that down, so you can disregard it.

Okay.

Apollo 7, Houston. One minute LOS Antigua;

Canary at 59, about 3 minutes.

Roger.

Canary (REV 116)

Apollo 7, Houston through Canary.

Apollo 7, Houston through Canary.

Roger. Clear Lake CAP COMM, this is Apollo 7.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 15 00 09</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 15 06 11</td>
<td>CC</td>
<td>Apollo 7, Houston. We will need S-band volume up for about a minute and a half longer contact over Madrid.</td>
</tr>
<tr>
<td>07 15 06 20</td>
<td>CMP</td>
<td>Roger. That is the first contact over Madrid, isn't it, Bill?</td>
</tr>
<tr>
<td>07 15 06 24</td>
<td>CC</td>
<td>I think we got one last night. In fact, we had a little trouble getting the handover executed.</td>
</tr>
<tr>
<td>07 15 06 32</td>
<td>LMF</td>
<td>Roger, Bill. And good morning.</td>
</tr>
<tr>
<td>07 15 06 34</td>
<td>CC</td>
<td>Good morning, sir. I was told I had better be real careful talking to you today.</td>
</tr>
<tr>
<td>07 15 06 45</td>
<td>LMF</td>
<td>Say again, Bill. Say again.</td>
</tr>
<tr>
<td>07 15 06 48</td>
<td>CC</td>
<td>Sorry, Walt. I thought that was Wally.</td>
</tr>
<tr>
<td>07 15 07 47</td>
<td>CC</td>
<td>Apollo 7, Houston. How do you read?</td>
</tr>
<tr>
<td>07 15 07 50</td>
<td>LMF</td>
<td>I read you loud and clear, Bill, but we've got an echo in the background.</td>
</tr>
<tr>
<td>07 15 07 54</td>
<td>CC</td>
<td>Roger. I hear you five-by, also with an echo. Did you understand the message that Donn gave you when I flowed the secondary radiators, that I'd like to have somebody watching them pretty close?</td>
</tr>
<tr>
<td>07 15 08 01</td>
<td>LMF</td>
<td>Yes, they said they had every intention of doing that, and they understood what you said. They understood the intent.</td>
</tr>
<tr>
<td>07 15 08 08</td>
<td>CC</td>
<td>Okay.</td>
</tr>
</tbody>
</table>
07 15 08 23  CC  And, Walt, we're coming up on LOS and - thought I'd just remind you that O₂ fuel cell purge.

07 15 08 31  LMP  I haven't looked at the flight plan yet. Let me take a look here. 183 is in work now.

07 15 08 36  CC  Roger. Thank you.

07 15 09 35  CC  Apollo 7, Houston. Carnarvon at 36.

CARNARVON (REV 116)

07 15 36 16  CC  Apollo 7, Houston through Carnarvon.

07 15 36 23  LMP  Roger, Bill.

07 15 36 28  CC  Roger.

07 15 36 33  LMP  Hey, Bill, we had the primary evaporator put on AUTO yesterday afternoon late in hopes that it would stroke sometime during the night and get reserviced. I can't verify it because I wasn't awake, but I don't believe it's operated all night long. We're on low power, and it's been almost 48 hours, so I'd like to find out about water - whether we ought to go ahead and manually run it for a few minutes before I do the secondary coolant loop.

07 15 36 58  CC  Stand by.

07 15 39 26  CC  Apollo 7, Houston. ECOM advises that the evaporator was reserviced less than 4 to 8 hours ago. But it's okay to recycle the back pressure valve by the normal procedure passed up earlier, but they recommend that you don't add water to it.
07 15 39 48 LMP: We're not going to add water, and we're not
going to recycle it. We're going to go ahead
with secondary coolant loop operation now.

07 15 39 56 CC: Walt, we're having a little keyhole trouble here.
Would you say again, please?

07 15 40 00 LMP: We're not going to add water to it, and I'm not
going to reservice it at this time. I'm going
ahead with the secondary coolant loop operation.

07 15 40 08 CC: Roger. Understand.

07 15 41 33 CC: Apollo 7, Houston. Opposite omni and 1 minute
Carnarvon LOS; Honeysuckle at 43 and a half.
Required S-band volume up.

07 15 41 45 LMP: Roger. Forty-three and a half. S-band volume up.

07 15 41 48 CC: Roger.

07 15 42 10 CC: Apollo 7, Houston. You can cease fuel cell purge
on fuel cell 3 now.

07 15 42 19 LMP: Roger. That completes all three of them?

07 15 42 21 CC: Roger.

HONEYSUCKLE (REV 116)

07 15 44 37 CC: Apollo 7, Houston through Honeysuckle.

07 15 47 41 CC: Apollo 7, Houston. We're monitoring your second-
ary loop performance. It looks okay so far. We
have about 4 and 1/2 minutes left, but there is
a keyhole uncertainty.


07 15 47 55 CC: Roger. We're monitoring the secondary loop, and
it looks good --
07 15 48 00  CMP  Roger. Understand.
07 15 48 05  LMP  Looks good here, Bill.
07 15 49 18  LMP  Hey, Bill, can you pick up a map update for us; and if you can't get it to us this station, will you give it to us over the next one?
07 15 49 24  CC  Roger. I've got one waiting for you here if you're ready to copy.
07 15 49 38  CC  Apollo 7, Houston. I have a map update when you're ready to copy.
07 15 49 43  CMP  Go ahead.
07 15 49 44  CC  For REV 116: 182 plus 47 plus 12, 74.2 west.
07 15 49 44  CC  For REV 117: time is 185 plus 48 plus 03, 120.5 west.

07 15 50 21  LMP  Roger.
07 15 51 20  CC  Apollo 7, Houston. One minute LOS Honeysuckle; Redstone at 04.
07 15 51 28  CDR  Roger, Bill.
07 15 51 28  CDR  REDSTONE (REV 117)
07 16 04 50  CC  Apollo 7, Houston through Redstone.
07 16 04 54  LMP  Roger. Loud and clear, Bill.
07 16 04 56  CC  Thank you.
07 16 05 22  LMP  Hey, Bill, verify for me on this secondary coolant test, that I have not bypassed the primary radiators. The pumps are off, but the radiators are not bypassed on the primary loop.
07 16 05 32  CC  Stand by.
07 16 05 38  CC  Roger. That's correct.
07 16 05 41  LMP  Thank you. Secondary loop seems to be doing fine.
07 16 05 44  CC  Right. We're watching it here, and it looks good.
07 16 06 08  CC  Wally, I have a question on this glitch you got in the number 1 ball when switching --
07 16 06 15  CDR  It's not a glitch, Bill. It happened three times and stayed that way on the third time. I cannot transfer GEC's to number 1 ball.
07 16 06 26  CC  Roger. One question that the ground would like to ask, and that is: what was the position of the inertial switch? Was the switch in INERTIAL on the audio panel?
07 16 06 41  CDR  That's affirmative.
07 16 06 42  CC  Roger. Thank you very much.
07 16 06 53  CDR  Bill, you still read?
07 16 06 55  CC  Roger.
07 16 06 56  CDR  It transferred and then flipped 180 degrees in pitch.
07 16 07 01  CC  180 degrees in pitch.
07 16 07 03  CDR  Roger. At first, I had it exactly right; then, it flipped right over. From then on, it kept flipping over.
07 16 07 10  CC  Okay. I think that's significant.
07 17 07 13  CDR  Roger.
07 16 07 14  CC  The fact that it was okay to start with --
07 16 07 16  CDR  Yes, but not very long.
Okay.

Right. Wally, the statement I got here was that even with the ORDEAL power switch OFF, you had to have INERTIAL selected to prevent this glitch from occurring when you select ORDEAL.

I'm well aware of that. Roger.

Roger. Okay.

Wait, let me know when you have a minute. I'd like to cover about three points on the BIOMED harness.

Okay. They better not be very elaborate points. I've got two sensors now with the good leads apparently hooked into the blue transducer. Over.

Okay. That's the yellow one hooked into the blue transducer. Is that correct?

Affirmative.

Okay. I'll pass on the recommendation. First point is, they would like to have tape wrapped around the leads starting with the yellow connector and wrapping the tape around the leads for about 2 inches down from the yellow connector to avoid a fatigue area there where the wires go into the little yellow housing or plastic covering.

Bill?

Roger.
07 16 09 22 CDR  Bill?
07 16 09 23 CC  Go.
07 16 09 25 CDR  I think we better refer back to the accident
board from where I stand. I'll have no triggers
in the suit loop, and we've gone much too far
with this kluge right now. Now when Donn Eisele
has a hot signal condition there, we've reached
the bitter end. If we get suited up for reentry,
we're gonna take them off.

07 16 09 49 CC  Roger. Understand. Copied.
07 16 09 51 CDR  Roger. I'm not yielding on that one.
07 16 09 58 LMP  Bill, last night I replaced the upper sternal
sensor with a new one that was low enough to
reach the lead.

07 16 10 07 CC  Good. That was the final point. They just
wanted to make sure if it was possible to get
the two sternal sensors located so that they
didn't put tension on the leads.

07 16 10 21 LMP  Right. I didn't think they wanted them right
next to each other. I got it as low as I could,
and they barely reach now. Looks like it will
probably work.

07 16 10 29 CC  Sounds good. Thank you very much.
07 16 10 31 CDR  Bill, we've done all we can, I think, to make
them work, and I'd rather not prevent a break-
age because that's the thing that scares us.
Donn had one, and I had one; and one more, and we just may have trouble.

Roger. I think there's been a good effort in that respect. I don't think there's any question from the ground.

Okay. Thank you.

Apollo 7, Houston. One minute LOS Redstone; MILA at 22. Secondary loop looks real good.

Roger.

MILA (REV 117)

Apollo 7, Houston through MILA.

Roger. Loud and clear.

Bill, we've got a ... for the day.

You were garbled. Say again, please.

We've got a problem for the day.

What's that?

We are very worried about the ears. They are all blocked up with these colds. We're having a time to get one to clear, and we are seriously considering reentering shirt sleeve. I'm afraid that we can't quite clear our ears on the way down, but if we do have to clear them on the way down, we'll have to take the helmets off. And then they become a hazard bouncing around the cockpit.
07 16 24 31 CDR  We feel the risk of rupturing our ear drums is higher than the risk of injury without having our suits on. We realize the restraint harness won't fit us closely, and we are considering we can wear our life vest over our shirt-sleeve clothing.

07 16 24 49 CC  Roger. I think we understand what you are saying there, and there has been considerable ground discussion regarding that.

07 16 24 57 CDR  At this point in time, we feel the risk is lower to come in shirt sleeves than it is in the suits.


07 16 29 14 IMP  Houston, Apollo 7. Over.

07 16 29 17 CC  Apollo 7, Houston. Go.

07 16 29 19 IMP  Roger. A 186 20 - I'm powering those items listed on the spacecraft 50-point configuration of the checklist, all except the - present plans are all except the OMC and the GAW, and will that bring us up to the proper power level for the next phase?

07 16 29 41 CC  Roger. Stand by.

07 16 30 29 CC  Apollo 7, Houston. Right. At 186 plus 40, you power up the SCS, and ground will command up some S-band equipment, but all that is necessary on board is for you to power up the SCS.
LMP  07 16 30 47  Okay. On that same list, we have one cabin fan. We've been generally running without the cabin fans. Should I - do I have to - have to power that cabin fan up or not?

CC  07 16 30 58  No. You can leave it OFF.

LMP  07 16 31 00  I can leave the cabin fan OFF.

CC  07 16 31 02  Right.

CC  07 16 31 50  Apollo 7, Houston. That secondary coolant loop is looking very good.

LMP  07 16 31 55  I concur.

CC  07 16 32 25  Apollo 7, Houston. Coming up on LOS; Canary at 35.

CDR  07 16 35 40  Houston, Apollo 7.

CC  07 16 35 41  Go.

CDR  07 16 35 43  Roger. Bill, did we give you a report on our MDC mission timer - a small crack in it a few days ago?

CC  07 16 35 51  Roger.

CDR  07 16 35 52  We have a second crack that developed after burn 5, and it is extending a little bit. It cuts from across left to right above the number 1 in one hundred's hours, and it cuts into tens of hours. We're reporting these so that they are logged prior to landing.

CC  07 16 36 19  Roger.

CDR  07 16 36 22  So there are two cracks now in that piece of glass.
07 16 36 24 CC Understand. Two cracks.
07 16 36 27 CDR Roger. And the second one was positively developed in flight - I can't really say about the first one.
07 16 36 34 CC But this one you noticed right after burn 5?
07 16 36 37 CDR That's correct.
07 16 36 39 CC Thank you.
07 16 40 37 CC Apollo 7, Houston. We'll need the USB volume up at 42 for contact through Madrid.
07 16 40 44 CDR Roger. - two?
07 16 41 14 CDR Roger. Apollo 7.
07 16 41 15 CC Go.
07 16 41 17 CDR Roger. This is a crying shame we don't have any film. We're getting some fantastic passes today.
07 16 41 23 CC Good.
07 16 41 26 CDR We got cut back too far on that film, I'm afraid.
07 16 41 36 CC Apollo 7, sorts faded out there. We'll call you on S-band here in about 30 seconds.
07 16 41 43 CDR Good.

MADRID (REV 117)
07 16 43 09 CC Apollo 7, Houston on S-band through Madrid. How do you read?
07 16 43 14 CDR Roger. Loud and clear with a slight echo.
07 16 43 17 CC Roger. One minute until LO; Carnarvon at 10.
07 16 43 23 CDR Roger. Carnarvon at 10.
07 16 44 00 LMP Hey, Bill, log LMP 15 clicks of water, will you, please?
Roger. 15. Thank you.

CARNARVON (REV 117)

Apollo 7, Houston through Carnarvon. Standing by.

Apollo 7, Houston through Carnarvon. Standing by.

Roger.

We have Carnarvon in sight in Sharp's Bay; we'll see if we can get another moment of the pass.

Roger.

Carnarvon loud and clear.

Right.

As always.

Tell them down there, Bill, we're right over them - 240 miles.

Right.

I think they know where we are better than we do.

It's not true. Well, I'm right here.

Lewis, we're looking down at you.

Apollo 7, Houston. Opposite omni, and S-band up at 19.

Hey, Bill, we apologize for having you work over the weekend.

You're too kind.

HONEYSUCKLE (REV 117)

Apollo 7, Houston. We have about 3 and 1/2 minutes to LOS, but we do have a keyhole problem. Texas at 53.
07 17 25 21  CDR  Texas 53. Roger.
07 17 25 27  CDR  Roger, Webster CAP COMM.
07 17 25 33  CC  I've moved.

**TEXAS through ANTIGUA (REV 118)**

07 17 53 14  CC  Apollo 7, Houston through Texas.
07 17 53 17  CDR  Loud and clear.
07 17 54 29  LMP  Nassau Bay CAP COMM, this is Apollo 7. Over.
07 17 54 32  CC  Roger. Go.
07 17 54 35  LMP  Roger. On the secondary coolant loop test, I'm logging fuel cell curves at three different times. I logged them when we started the test. What are the other times of the loop to be logged?

07 17 54 48  CC  Would you say again the last part there, Walt? I didn't quite understand.

07 17 54 53  LMP  On the secondary coolant loop DTO, I logged the fuel cell curves when we started the test. What are the other two blanks for what times? One's when you've got the high power on, I would imagine, but I don't know what the third one's for.

07 17 55 08  CC  Stand by.
07 17 55 15  CDR  Timber Cove CAP COMM, do you have any word on the GDC problem on ball 1?
07 17 55 19  CC  Negative.
07 17 55 40  CC  Walt, we're checking on those times.
07 17 55 46  LMP  Roger, La Porte CAP COMM.
07 17 55 57  CC  I feel like I'm gonna be had.
07 17 57 01  CDR  No. That's Friendswood.
07 17 57 59  CC  Apollo 7, Houston. In reference to the logging of fuel cell currents opposite selected times, you can disregard. That was only in case we couldn't get readouts, and we are getting good readouts.
07 17 58 15  LMP  Roger. Thank you.
07 17 58 20  CC  Roger. We're getting it on the DSE, and it's running. Also, in relation to the FDAI 1, apparently, the troops thought they had it figured out here, but it had to do with the switch not being in INERTIAL, and when you said it was, it sort of threw them back to the drawing board, and they're still looking at it.
07 17 58 41  CDR  Yes, I went through that caper long ago in the simulator. Thank you, Dickinson.
07 18 00 32  CC  Apollo 7, Houston. You're GO for 135 dash one.
08 18 00 38  LMP  Roger. Thank you, Dickinson Center.
07 18 07 26  CC  Apollo 7, Houston. One minute LOS; we'll have Canary at 11, and we will have an S-band backup voice check.

CANARY (REV 118)
07 18 11 56  CC  Apollo 7, Houston through Canary.
07 18 12 04  LMP  Roger, League City CAP COMM.
07 18 13 09  CC  Apollo 7, Houston. For a check on our backup S-band, request up telemetry date switch to UP VOICE BACKUP and S-band volume increase.
07 18 13 33   LMP   Houston, Apollo 7. I'm in UP VOICE BACKUP.
07 18 13 42   CC    Okay.
07 18 14 02   LMP   Houston, Apollo 7.
07 18 14 05   CC    Apollo 7, Houston. Go.
07 18 14 07   LMP   I'm in UP VOICE BACKUP. Have you called me?
07 18 14 12   CC    Right. Apollo 7, Houston. Do you read?
07 18 14 16   LMP   Houston, Apollo 7. I'm reading you five-by.
07 18 14 20   CC    Roger. We'll stay on this for a minute and see how it checks out.
07 18 14 26   LMP   Then I'm UP VOICE BACKUP?
07 18 14 29   CC    Affirmative.
07 18 14 32   LMP   Very, very clear.
07 18 14 33   CC    Good.
07 18 14 34   CDR   Bill, are we - are we going over the Canary Islands now?
07 18 14 37   CC    Affirmative.
07 18 14 38   CDR   Roger. Have them in sight.
07 18 15 46   CC    Apollo 7, Houston. Three minutes until LOS.
07 18 15 53   LMP   It seems to be cutting in and out.
07 18 15 55   CC    Okay. I'll give you a short count. One, two, three, four, five, four, three, two, one. Short count out.
07 18 16 08   LMP   Roger. Read you five-by-five.
07 18 16 10   CC    Good.
07 18 16 16   CC    Apollo 7, Houston. You can put up telemetry data switch back to DATA.
07 18 16 22 LMP Roger.
07 18 17 10 CC Apollo 7, Houston. Back on VHF.
07 18 17 19 CC Apollo 7, Houston. Back on VHF.
07 18 17 23 CDR Loud and clear.
07 18 17 26 CC Roger. About a minute and a half Canary LOS; Carnarvon at 45.
07 18 17 32 CDR Roger.
07 18 17 46 CC And, Apollo 7, we'd like to confirm up telemetry data switch to DATA.
07 18 17 52 LMP Telemetry data switch to DATA.
07 18 17 54 CC Roger.
CARNARVON (REV 118)
07 18 45 39 CC Apollo 7, Houston through Carnarvon. Standing by.
07 18 45 55 CDR Loud and clear.
07 18 45 57 CC Roger.
07 18 46 15 LMP Houston, Apollo 7.
07 18 46 16 CC Go.
07 18 46 18 LMP Would you run through the SPS power-up checklist and tell me if our loading right now is adequate for this part of the test?
07 18 46 26 CC Stand by.
07 18 46 38 CC Apollo 7, Houston. We'll be right back with you; we're checking it out.
07 18 46 42 LMP Thank you.
Apollo 7, Houston. Opposite omni; also, your load now is from 350 to 400 watts, which is the required delta. We have powered up the S-band power amplifier and the FM transmitter.

Roger.

Houston, Apollo 7.

Apollo 7, Houston. Go.

Roger. Magazine R, Frame 33, Shark's Bay and Carnarvon station; Frame 34 is a town just south of there.

What was the subject for Frame 33?

Frame 33 is Shark's Bay and Carnarvon; Frame 34 is a town about 60 miles south of there.

Thank you.

Apollo 7. Do you have a GDC on FDAL 1?

Negative.

Thank you.

That's just the IMU wheeling around.

Roger.

Apollo 7, Houston. Coming up on LOS Carnarvon. You can turn the S-band volume up in 1 minute.

Roger.

EowieSuckle (REV 118)

Apollo 7, Houston.

Roger.
07 18 57 29  CC  I have a couple of questions. First, I'd like to know if you did a COAS calibration back on the second day during the rendezvous?

07 18 57 42  CDR  Negative.
07 18 57 43  CC  Roger. And second --
07 18 57 45  CDR  Wait a minute. Donn did one before the rendezvous.
07 18 57 49  CC  Okay. Fine. That's good; thank you.
07 18 57 51  CDR  Do you want the numbers on that, or did you lose them?
07 18 57 55  CC  Stand - I'll wait until they ask you for them here. Apparently, they just want you to know if you've done it. Second point, have you done a P53 and a P54 using the COAS?

07 18 58 07  CDR  Negative.
07 18 58 09  CC  Thank you.
07 18 58 10  CDR  We probably almost had to.
07 18 58 44  CDR  Do you read?
07 18 58 46  CC  Apollo 7, Houston.
07 18 58 48  CDR  On the COAS alignment, the target is to the right 1 degree and up 1 degree.
07 18 58 58  CC  Right 1 degree and up 1 degree.
07 18 59 01  CDR  That's right 1 degree and up 1 degree. Basically, that means there's a space across left 1 degree and down 1 degree to be aligned.

07 18 59 10  CC  Roger.
07 18 59 12  CDR  In front of the target.
07 18 59 13  CC  Roger.
07 18 59 16  CDR  In other words, the target shows up in the
northeast quadrant.
07 18 59 20  CC  Target shows up in the northeast quadrant. Right.
07 18 59 23  CDR  Okay.
07 19 00 07  CDR  El Lago CAP COMM.
07 19 00 10  CC  Say again.
07 19 00 12  CDR  El Lago CAP COMM.
07 19 00 13  CC  Roger.  Co.
07 19 00 14  CDR  Roger.  On power up, we had 0.8 degrees per sec-
ond in yaw to the right, zero in roll, and zero
in pitch.
07 19 00 24  CC  Roger.  0.8 degrees per second yaw right, zero
roll, zero pitch.
07 19 00 30  CDR  That's correct.
07 19 00 32  CC  Also, we have been monitoring the power load
here.  The delta is about 300 watts.  We would
like to bring up inverter 3 to main A, but don't
put on either bus.  This will give you an ad-
ditional 100 watts.
07 19 00 52  LMP  Roger.  You want to run that inverter without
load, then, for the next 4 and 1/2 hours?
07 19 00 59  CC  That's affirmative.
07 19 01 14  LMP  How about - what if we powered up the G&M?
07 19 01 17  CC  Stand by.
The GAN isn't cool with the secondary loop.

That's a good point.

Inverter 3 going on main A.

Roger.

Apollo 1, Houston. One minute LOS Honeysuckle; Huntsville low elevation pass at 21; Guaymas at 25.

Roger.

Apollo 7, Houston through Guaymas.

Roger.

Apollo 7, Houston. Like O₂ tank 2 fans on 3 minutes and then OFF.

Roger, La Porte.

Houston, we have changed canister 16.

Roger. Canister 16; thank you.

Roger. I'll be coming up on humidity check soon.

Roger.

We haven't had much luck with this revised sleep schedule, Bill. It's been revised to fit the flight plan this way. We're all up and going at 2:00 in the morning Cape time. You understand why, because we're trying to stack this stuff in for Sunday night - Monday night, excuse me.

Apollo 7, Houston. Understand that last transmission had to do - something about a sleep cycle.
We're still a bit low; COMM is not too good right now.

07 19 28 14 CDR Roger. We're not having much luck with our sleep.
07 19 28 17 CC Roger. Understand that.
07 19 28 31 CC Apollo 7, Houston. Opposite omni.
07 19 28 35 CDR Roger. I think we'll still have a good show for you tonight though, Bill.
07 19 28 42 CC Roger.
07 19 28 48 CDR We have just finished rehearsing.
07 19 29 07 CDR Houston, do you still read?
07 19 29 09 CC Roger, Apollo 7. Go.
07 19 29 11 CDR Okay. Are you going to pass on our comments about a probable - I would like to put it that way - shirt-sleeve reentry?
07 19 29 18 CC Roger. I have already passed that on.
07 19 29 20 CDR Okay. I guess we'll talk about that the next watch or something. Is that right?
07 19 29 24 CC Roger.

GUAYMAS through BERMUDA (REV 119)

07 19 29 31 CC Yes. We've been talking about that for a couple of days in fact.
07 19 29 34 CDR Yes, and I just got a real kleenex full.
07 19 29 47 CDR How did that consultant's idea come out?
07 19 29 56 CC Say again.
07 19 29 57 CDR The consultant who said if we hadn't flown we probably would have gotten colds anyway.
CC 07 19 30 02  Oh, I don't know.
CT 07 19 30 08  ...
CC 07 19 30 12  I don't know about that.
CDR 07 19 30 15  Yes. Okay, Bill.
CC 07 19 30 21  The gold team hasn't got to read any newspapers.
                   We're all working.
CDR 07 19 30 26  Ho, ho, ho!
OMP 07 19 30 33  Are you going to rush home and watch the tele-
                   vision show this morning, Bill?
CC 07 19 30 37  No, I'm going to watch it from here this morning.
CDR 07 19 30 40  You are going to sleep in, huh?
OMP 07 19 30 43  Is that show carried live every morning?
CC 07 19 30 45  Right. It is, and we're - this shift goes through
                   the television sequence this morning.
CDR 07 19 30 53  You're really in there, huh?
CC 07 19 30 55  Oh, boy.
CDR 07 19 30 56  You're getting all the big ones: burn 5, tele-
                   vision.
LMP 07 19 31 01  How does that picture turn out over the com-
                   mercial screen by the time it gets there?
CC 07 19 31 05  It's pretty good. In fact, I was very surprised
                   the first time I saw it. I was ready for some-
                   thing like what we saw out at integrated, and
                   it turned out it was not difficult at all to
                   recognize you, and I was really impressed with
                   the quality.
I gather the recommendation is to move rather slowly.

Roger. Fast panning — of course, you get — sort of "burn in" on that vidicon, I guess. And if you move very slowly, it stays fairly sharp; and, of course, the steadier you hold the camera, the sharper the images.

Very good.

Say, Bill, this is Donn. I called up several hours ago regarding some DTO's, and I wondered if you could run it by again to see if we could gin up an answer.

Was this the one regarding the backup alignment?

That's right.

Roger. The reading I have on that is they would still like to do both of them. The first one gives you a check on your GDC and IMU both. You align the GDC, and then you drag it over to an attitude; and then you align the IMU, and when you do the star check at that point, you get a gross additive error from the time at which you started the process. The second DTO involves a GDC alignment to a known IMU, and this gives you a good handle on the error in the GDC alignment itself, and this, they think, is going to give them information in properly evaluating the total error on the GDC and IMU alignment.
I can see the rest now, but I think it's getting awfully pure.

Yes. Anytime we have to use the line, we can try GDC align to it.

Isn't that right?

That's affirmative.

Bill, what planet is that right next to the moon?

Stand by.

We are looking at it right now; you ought to walk outside.

We are guessing Venus.

I have a further - they are checking on that planet, by the way. I have further information on this DTO. They are looking right now at replacing the backup IMU alignment with a P53 - P54 COAS.

That sounds more exciting.

That sounds a little more sensible to me.

Okay.

I thought you were building up to that with that COAS check and all that good stuff.

The planet is Jupiter.

Jupiter? Oh.

By Jove.

It's a real pretty sight; we got the sunrise, "yewpiter", and then the moon, all within about 8 degrees of each other.
07 19 35 02 CDR Negative. About 20 degrees. I can still see the moon, but Jupiter is out of sight, and the sun is up.

07 19 35 15 CDR And they sparkle plenty.

07 19 35 18 CC Right.

07 19 35 38 CC Apollo 7, Houston. The secondary coolant loop is still performing excellently.

07 19 35 43 CDR Okay.

07 19 38 50 CC Apollo 7, Houston.

07 19 38 53 CDR Go ahead.

07 19 38 54 CC Roger. If Donn is ready to copy, I have this change in relation to this DTO.

07 19 39 01 CDR Roger. We’re just doing a humidity check.

07 19 39 05 CC Okay. I’ll stand by.

07 19 39 07 CDR Go ahead. I can write it on the flight plan.

07 19 39 09 CC Okay. At 191 plus 40 in the flight plan, you can delete the reference in the MCC update box there regarding a backup IMU alignment and replace it with T align time for P54. Just T align for P54.

07 19 39 40 CDR Okay.

07 19 39 48 CC And at 193 hours, delete IMU backup align and reference to sextant star check at 193 plus 30; don’t need to write that down, I don’t think – with P53 - P54 IMU backup align with COAS.

07 19 40 27 CDR Roger.
And this is merely a note: recommended P52 option 3 at the station of sequence as a check; power down at completion of sequence. The approximate RCS consumption will be 3 to 4 pounds.

That's a nice prediction. Okay.

And that's it.

Apollo 7, Houston. One minute LOS Bermuda; Canary at 47.

Roger.

CANARY (REV 119)

Apollo 7, Houston through Canary.

Apollo 7, Houston.

Go.

Roger. Walt, I'd like to go over this relay COMM mode test.

Roger. Bill, we've already done that once, and we'll just configure it the same way we did then, right?

Well, this is for USB up and VHF down.

Right. It's the same switch configuration for either one. Any exception to the exceptions?

Apollo 7, Houston. Walt, they say the test didn't work last time, and EECOM would like for me to go ahead and go through this check the way they have written it to see - to make sure they have covered all their bets here.
07 19 50 10 CDR Bill, is it any different on their slide rule?
07 19 50 15 CC Apollo 7, Houston. Opposite omni.
07 19 50 20 LMP I can plot for you with our slide rule, and pass up the differences, will you?
07 19 50 26 CC Roger. Okay. You configure the center audio panel per side 2 the COMM slide rule relay mode; and, in addition to that, do the following: on the center audio panel, the C&M's VOX sensitivity thumb wheel to 06.
07 19 50 52 LMP VOX sensitivity to 06.
07 19 50 54 CC S-band normal voice relay.
07 19 51 02 LMP Roger.
07 19 51 03 CC VHF AMA Duplex, VHF AMB OFF, and squelch B setting to 05.
07 19 51 17 LMP Okay. The only thing you added to the normal procedure is the squelch B setting to 5; and I think there's a VOX mode higher than that last one, isn't there?
07 19 51 33 CC Wait, we don't know what they had last time, but we'd like for you to have it set up this way before Carnarvon acquisition, and that will be at 188 plus 21, and we'll try to contact you on this mode for Carnarvon. We have a very brief pass by Tananarive at 06.
07 19 51 58 LMP Understand. Wilco.
07 19 53 00 CC Apollo 7, Houston. One minute LOS Canary; Tananarive at 06.
07 19 53 08  LMP  Roger.

TANANARIVE (REV 119)

07 20 08 38  CC  Apollo 7, Houston through Tananarive.

07 20 08 44  CDR  Roger. Houston, Apollo 7.

07 20 08 46  CC  Roger.

07 20 09 20  LMP  Would you get us a map update and a right ascen-

sion for the star chart, please?

07 20 09 25  CC  Roger. Will.

07 20 09 46  CC  REV 121, 192 plus - stand by; disregard that one.

For REV 121, it's 191 plus 49 plus 39, nodal cross-

ing at 147.0 east; right ascension for star chart

update is 02 33.

07 20 10 23  LMP  Roger. Understand. The right ascension is

2 hours and 33 minutes, right?

07 20 10 28  CC  Affirmative. And for one - did you just want

a star chart update?

07 20 10 34  LMP  No, I wanted both.

07 20 10 37  CC  Roger. Then for -

07 20 10 54  CC  Walt, when you said you wanted that for two revs

ahead, did you mean to go to the second rev be-

yond, like one, two, one?

07 20 11 05  LMP  Forget that, Bill.

07 20 11 06  CC  Okay.

07 20 11 08  CMP  I don't think it matters that much, Bill.

07 20 11 10  CC  Okay, Donn.
Apollo 7, Houston through Carnarvon.

Roger, Houston.

Roger. Standing by.

Roger. Do you want to go to this relay mode now?

Stand by.

Roger. We are ready to do the test.

Okay. I'll configure the switches then.

Okay. Thank you.

Apollo 7, Houston. How do you read? Over.

Apollo 7, Houston. Relay mode; how do you read?

Over.

Apollo 7, Houston. I am relay mode; how do you read? Over.

Apollo 7, Houston. How do you read?

Apollo 7, Houston.

Roger, Bill. How do you read?

Roger. I read you five-square. The test was satisfactory.

Okay. Thank you. Do you want us to go back to Simplex A?

Roger. Let's go back to the original configuration.

...

Apollo 7, Houston. Did you have your S-band volume up during that test?
07 20 27 04 LMP My S-band volume was not; I was reading you, however.
07 20 27 07 CC Roger. Thank you.
07 20 29 07 CC Apollo 7, Houston.
07 20 29 08 LMP Go, Houston.
07 20 29 10 CC I have been asked to pass on some helpful household hints here on TV improvement.
07 20 29 19 CDR Go ahead.
07 20 29 20 LMP Go ahead.
07 20 29 21 CC (Laughter) You sound pretty eager there. Right. One of the things they have mentioned is to remove the lens and blow the dust off the vidicon tube; second, clean the lens; third, the best quality is obtained with a fixed mount; fourth, they would like for you to try for some window views over Texas.
07 20 29 50 LMP I thought that the spacecraft motion over the ground precluded getting any good window views.
07 20 29 57 CC I concur; I saw your attempts. I saw one good shot of the Florida coast, however, but I was just passing on this information.
07 20 30 09 CDR Okay. We won't be in active hold today, and we'll plan it tomorrow.
07 20 30 14 CC Okay.
07 20 30 15 CDR If we are drifting, it's almost impossible.
07 20 30 17 CC Roger. Understand.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 20 30 18</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>07 20 30 20</td>
<td>CC</td>
<td>Hey, Wally, this is Jack.</td>
</tr>
<tr>
<td>07 20 30 23</td>
<td>CDR</td>
<td>Good morning.</td>
</tr>
<tr>
<td>07 20 30 24</td>
<td>CC</td>
<td>Good morning. If you take any pictures of the ground, the camera has to be very, very still.</td>
</tr>
<tr>
<td>07 20 30 31</td>
<td>CDR</td>
<td>Understand. Think you will come in for the TV production?</td>
</tr>
<tr>
<td>07 20 30 36</td>
<td>CC</td>
<td>No, I was just watching.</td>
</tr>
<tr>
<td>07 20 30 39</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>07 20 30 41</td>
<td>LMF</td>
<td>We'll follow the rest of the hints from Heloise.</td>
</tr>
<tr>
<td>07 20 31 03</td>
<td>CMP</td>
<td>There must be a great demand for this sort of thing, to get all these hints.</td>
</tr>
<tr>
<td>07 20 31 09</td>
<td>CC</td>
<td>You just don't know how much of a demand there is.</td>
</tr>
<tr>
<td>07 20 31 19</td>
<td>LMF</td>
<td>We haven't decided yet whether our category is a preplanned series or a special.</td>
</tr>
<tr>
<td>07 20 31 45</td>
<td>CDR</td>
<td>Jack, by the way, who's doing the interiors for the ... now?</td>
</tr>
<tr>
<td>07 21 31 55</td>
<td>CC</td>
<td>We missed that, Wally.</td>
</tr>
<tr>
<td>07 20 31 57</td>
<td>CDR</td>
<td>Like Peter Hackett does on NEC, who does the interiors ...</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>HONEYSUCKLE (REV 119)</strong></td>
</tr>
<tr>
<td>07 20 32 12</td>
<td>CC</td>
<td>Apollo 7, Houston. S-band volume up, please.</td>
</tr>
<tr>
<td>07 20 32 16</td>
<td>CDR</td>
<td>We'll check the VHF channel not clear.</td>
</tr>
<tr>
<td>07 20 32 23</td>
<td>CC</td>
<td>Yes, we got some interference there, also.</td>
</tr>
<tr>
<td>07 20 32 25</td>
<td>CDR</td>
<td>We got a bunch.</td>
</tr>
</tbody>
</table>
Did you follow my last question?

No, I didn't, Wally.

Typically, they show the interior of a spacecraft; they got a mockup. Who is the announcer for the mockups?

I haven't seen any of the commercial television myself. The only television I've seen is when it comes over our monitor here; and we're getting it live, and it's going out live through the networks.

Roger.

Apollo 7, Houston. We would like O₂ tank 2 fans back OFF.

Okay.

They're OFF.

Thank you.

When you ask for 3 minutes, you really get them.

Roger. Stir them up good.

Roger.

Should we get out and start all over again? Good morning.

Houston, are you deleting the hydrogen fuel cell purges?

Yes, all of them are deleted.

Roger.

We will schedule them when we need them.

Roger.
07203746 CC Apollo 7, Houston. Coming up on AOS Hawaii at 50.

HAWAII (REV 119)

07205053 CC Apollo 7, Houston through Hawaii.

07205213 CC Apollo 7, Houston through Hawaii.

07205228 LMP Houston, Apollo 7. You read? Over.

07205230 CC Roger. Apollo 7, Houston. How do you read?

07205233 LMP Fine. I heard your first call, Bill.

07205235 CC Okay.

07205332 LMP ... the narrative, too?

07205238 CC Say again, Apollo 7.

07205341 LMP Roger. When they go live with this television, do they carry the narrative, too?

07205345 CC Affirmative.

07205504 CC Apollo 7, Houston. Give me a short count, please.

07205510 CDR Short count: one, two, three, four, five, five, four, three, two, one. Over.

07205514 CC Roger. Read you five-square with a little scratch.

07205519 CDR That was an itch.

07205527 CDR If you could see the beards we have, you would sympathize.

07205529 CC Roger. We aren't reading your VHF. We're picking you up on S-band.

07205535 CDR Roger.

07205539 CC You might check S-band NORMAL voice-to-voice and VHF AMA to SIMPLEX.

07205544 LMP Roger. I confirm those switch positions.
07 20 55 47 CC Roger.
07 20 55 55 CC Apollo 7, Houston. Opposite omni.
07 20 57 09 CC Apollo 7, Houston. How do you read now?
HUNTSVILLE (REV 119)
07 20 58 20 CC Apollo 7, Houston through Huntsville. How do you read?
07 20 58 26 LMP Fine, Bill. Well, a little weak now. How about you?
07 20 58 30 CC I'm reading you about three-by-three.
07 20 58 34 LMP Roger. Look, we'll turn the camera at 02, and we would like to hear a call from you when you are receiving the picture so we can get the show rolling.
07 20 58 44 CC Roger. Understand. I'm ready any time you are, Sea Bee.
07 20 58 57 CDR ... into millions.
07 20 59 49 LMP Hey, Bill. Do you read?
07 20 59 51 CC Roger. Go.
07 20 59 53 LMP Roger. I show that the tapes - okay, our tape is stopped here dumping. I'm going to go off the tape and turn the TV switch on the S-band AUX.
07 21 00 01 CC Roger.
07 21 00 37 CC Apollo 7, Houston. We'll command the tape switch from the ground.
07 21 00 43 LMP Roger. I've got selected now.
07 21 00 46 CC Roger.
GUAM through ANTIGUA (REV 119)

07 21 02 28  CT  Huntsville LOS.

07 21 02 45  CDR  This is Apollo 7. Do you read?
07 21 02 47  CC  Roger. Go.
07 21 02 49  CDR  Do you have a picture?
07 21 02 50  CC  Negative. I'll give you a call as soon as we get one.
07 21 02 55  CDR  Roger.
07 21 03 38  CC  Apollo 7, Houston. We are starting to receive it now.
07 21 03 41  CDR  Roger.
07 21 03 54  CC  We can't quite tell the perspective here. Looks like we are looking down at one of the couches.
07 21 03 58  CDR  That is affirmative. Good morning, Houston; you are looking down the couches. The crew is out just now for a coffee break. I think you will find that without the crew here, there is absolutely nothing to fear - nothing to fear. This is a taped message.
07 21 04 16  CC  Is this a fully automated flight?
07 21 04 18  IMP  That's affirm. At this point, I would like to give you slow scan of the cockpit. The crew is out for a short break, so we will find them shortly, I'm sure. As we look across the couches, you will notice that we are coming through to the total instrument panel and then coming around the
panel. You will note that we have a full amount of lighting in here, which helps us under all conditions.

07 21 04 43 CC That is an excellent picture right there.
07 21 04 45 CDR Roger. There is back lights in the panel as well as front lighting with floodlights. We are using floodlights now.
07 21 04 52 CC That is very good.
07 21 04 53 CDR Looking at the heart of the spacecraft - as far as reference goes, the so-called FDI, the flight direction attitude indicator - you are viewing now the various attitudes, and that system is not operating. We are in drifting flight. We will start with our entry monitor system, which we will use Monday evening - actually Tuesday morning - to return. The myriad of switches you see here are for controlling the various attitude thrusters and for monitoring the launch boosters.
I'll pass it on to another unseen hand, and you can view on his panel some of the results.

GUAYMAS through ANTIGUA (REV 120)

07 21 05 46 COM On this portion of the panel, you see the DSKY, that is, the display keyboard for our onboard computer. We use the computer for various calculations for earth orbit, navigation, and for aligning the inertial platform. Oh, I see someone is coming in now.
Good morning, Captain. Up above the display keyboard is another instrument identical to the one that Wally just described. The reason we have two is that if one fails, we will have a backup. Also, we have two completely separate attitude reference systems; we can have one displayed on one ball, and the other on this one in front of you. Now, I will pass the camera on down to the next unseen hand.

Roger. Good morning to everyone in television land. You are looking at the right-hand portion of the main display console. The upper left-hand portion of your view, you will see the instrument that has to do with the cryogenics that are used to power the fuel cells and provide breathing oxygen in the spacecraft. Just beneath those, the round dials are devoted exclusively to environmental control system monitor functions; and immediately below those, the switches which control the environmental control system. Moving on slightly over to the right, we have several meters which monitor the service propulsion system which were used during the burns we made the other day. I see we have another crewman coming in from his coffee break here, and here he comes, ladies and gentlemen. Lo and behold, it is our navigator; he found himself.
Continuing here just briefly, we have a large number of switches at the bottom of this panel which have to do solely with communications. One of those switches you might be able to read - it is labeled TV and by turning that switch on, we started to send this picture to you.

This instrument here is the quantity meter for our main propulsion system. It reads out to - percentage quantity remaining. And here comes a third member of our party, arriving.

Old Smoothie himself.

It is known in the parlance of spacecraft talk that we have a crew commander. What is not known too well by many is that we run a taut ship here, and to maintain physical discipline as well as moral discipline, we carry on a local, orderly drill instruction period. At this time, gentlemen, left face. About face - about - about face; crewmen drift. As you can see, we have our lighter moments.

Oh, that's bad.

As you can see, our spacecraft provides both lighter moments and moments of relaxation. We have one other motion that is called enforced march, which might be indicative of the control we have in the new mode, as we have titled it, intravehicular
activity or IVA. This is somewhat modernized over the older form of activity of EVA.

07 21 10 28 CDR Hup two. You may note from this that we have our ups and downs.

07 21 10 46 CMP We have got to get a new writer. Just a second, and we will dolly in camera 2 and see what the erstwhile drill sergeant is doing.

07 21 11 05 CMP And there we have him. You can see he has been working very hard. Wally has been drilling his troops.

07 21 11 10 CC Yes, there we are.

07 21 11 14 CMP Do you see the drill master here?

07 21 11 17 CC Right. We have a good picture again. We lost it for just a minute.

07 21 11 23 CMP Roger. We switched it off and dollied in camera number 2.

07 21 11 26 CC I see.

07 21 11 27 CMP That's all technical talk among us television people.

07 21 11 35 CDR You tell 'em ...

07 21 11 37 CC They want to know what kind of dollies you have?

07 21 11 40 CMP Not the right kind.

07 21 11 56 CDR We are going to try to get another lens up. We are - we're tempted to show you the outside. This is rather good weather. We will get a long telephoto lens on it. At this time, I will show
you the long equipment bay while Walt is digging out that lens. The weather is somewhat scattered. Quite a few large cloud formations overcast over the Gulf. I believe if you will bear with us, we will change lenses and get an outside view.

07 21 12 23  CC Good show, Wally. The picture is exceptionally good today.
07 21 12 27  CDR Roger. The camera is going OFF.
07 21 12 28  CC Right.
07 21 12 42  CDR Okay. We are going outside. Do you want ALC OUT or IN?
07 21 12 46  CC We want adjacent omni first. Stand by.
07 21 12 50  CDR Okay. We're outside. Camera's coming ON.
07 21 12 55  CC ALC out, please. We do not have a picture.
07 21 13 15  CC We still don't have a picture.
07 21 13 18  CDR ...
07 21 13 23  CC We must be right on the fringe of reception.
07 21 13 30  CC Try opposite omni, please.
07 21 13 54  CDR Roger. We're turning camera off.
07 21 13 55  CC Okay.
07 21 14 25  CC Apollo 7, Houston. Confirm you have turned the camera off.
07 21 14 29  CDR Yes.
07 21 14 30  CC Roger.
07 21 14 31  CDR Next time, we will have to get better material or better writers.
It's also suggested better actors.

Our actors' equity demands more sleep next time.

Right.

We would have thought of a better plot, but we didn't get enough sleep last night.

Okay. I get the point.

Apollo 7, Houston. The secondary loop still looks very good. About one and a half minutes LOG; Tananarive at 41.

Roger. Bill, can you give us a readout on what our waste water quantity was at the start of this test, and what we're showing now?

Right now the waste water is 55.8 percent. Stand by for the previous reading.

Roger. At 183.40.

And, Bill, we welcome suggestions for tomorrow's bit.

Go.

We need them.

I'm sorry you were cut out. Say again.

We welcome suggestions for tomorrow's bit.

I'm sorry. I didn't get that, Wally.

We welcome a new script for tomorrow.

Oh, I'm sorry. Okay. I guess you've got as many ideas as we do. That was actually very good today. That was the best I've seen the picture.
I thought the pictures of the instrument panel were very good.

<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 21 18 09</td>
<td>CDR</td>
<td>I'm talking about that other part. No acting awards today?</td>
</tr>
<tr>
<td>07 21 18 15</td>
<td>CC</td>
<td>I'm afraid to say anything.</td>
</tr>
<tr>
<td>07 21 18 24</td>
<td>CMP</td>
<td>Okay. If you're so smart, you come up here and do it.</td>
</tr>
<tr>
<td>07 21 18 27</td>
<td>CC</td>
<td>Hey! I welcome the opportunity.</td>
</tr>
</tbody>
</table>

**TANANARIVE (REV 120)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 21 42 25</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive. Standing by.</td>
</tr>
<tr>
<td>07 21 49 06</td>
<td>CC</td>
<td>Apollo 7, Houston. We're about LOS Tananarive. Do you want to turn up your S-band volume? We have an ARIA aircraft in about 3 minutes.</td>
</tr>
</tbody>
</table>

**ARIA 2 (REV 120)**

<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 21 53 09</td>
<td>CT</td>
<td>ARIA 2, go REMOTE.</td>
</tr>
<tr>
<td>07 21 53 55</td>
<td>CT</td>
<td>ARIA 2 has AOS. ARIA 2 has AOS.</td>
</tr>
<tr>
<td>07 21 54 04</td>
<td>CC</td>
<td>Apollo 7, Houston through ARIA.</td>
</tr>
<tr>
<td>07 21 54 48</td>
<td>CT</td>
<td>ARIA 2 has two-way lock. ARIA 2 has two-way lock.</td>
</tr>
<tr>
<td>07 21 55 13</td>
<td>CC</td>
<td>Apollo 7, Houston through ARIA.</td>
</tr>
<tr>
<td>07 21 56 24</td>
<td>CC</td>
<td>Apollo 7, Houston through ARIA.</td>
</tr>
<tr>
<td>07 21 56 32</td>
<td>LMF</td>
<td>Roger, Houston. You just -</td>
</tr>
<tr>
<td>07 21 56 35</td>
<td>CC</td>
<td>Roger, Walt. You faded out, also. We'll just stand by here on ARIA and pick you up at Carnarvon in a few minutes.</td>
</tr>
<tr>
<td>Time</td>
<td>Call Sign</td>
<td>Text</td>
</tr>
<tr>
<td>-------</td>
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<td>------</td>
</tr>
</tbody>
</table>
| 07 21 56 44 | LMP | I've got a little dope on the pictures we've been taking with the 16mm. You can pass on to the ...
<p>|  |   | I've labeled the reels as we take them - 1, 2, 3, 4, et cetera, we'd like to keep them together if they will. |
| 07 21 57 14 | LMP | Houston, Apollo 7. |
| 07 21 57 16 | CC | Roger. Walt, I got your comments on the 16mm film. You've labeled the reels 1, 2, 3, 4? |
| 07 21 57 23 | LMP | On to the end, some of the reels overlap, so we'd like to see them kept in that order. |
| 07 21 57 30 | CC | Okay. Understand. |
| 07 21 57 32 | LMP | And they shouldn't be released until we take a look at them. |
| 07 21 57 35 | CC | Okay. |
| 07 21 57 36 | LMP | This is the movies that we've taken onboard, and I assume you people are monitoring fuel cell 2 and giving its usual daily ditty, huh? |
| 07 21 57 49 | CC | That is affirmative. |
| 07 22 07 31 | CC | Apollo 7, one minute LOS Carnarvon; Hawaii at 24. |
| 07 22 07 39 | LMP | Roger. Jack, and I'd like to log that the water gun has become very difficult to work. The trigger is slowly getting very, very hard to push - and retract, mostly. |
| 07 22 07 52 | CC | Okay. Copy that. |</p>
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 22 08 01</td>
<td>LMP</td>
<td>And you remember yesterday we mentioned the chlorine injector, how it had a scum in it?</td>
</tr>
<tr>
<td>07 22 08 05</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 22 08 07</td>
<td>LMP</td>
<td>It died out overnight, apparently, and it had the form of salts this morning. I guess it's the kind of water that maybe something didn't get in and gum up the works on this water pistol, too. It's lasted - it's done very well up until now, but it's sure getting hard to work.</td>
</tr>
<tr>
<td>07 22 08 25</td>
<td>CC</td>
<td>Okay. Copy that, Walt.</td>
</tr>
<tr>
<td>07 22 08 31</td>
<td>LMP</td>
<td>And log me 25 clicks of water, will you?</td>
</tr>
<tr>
<td>07 22 08 34</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>07 22 27 23</td>
<td>CC</td>
<td>Apollo 7, Houston through Hawaii.</td>
</tr>
<tr>
<td>07 22 27 28</td>
<td>LMP</td>
<td>Good morning, Jack.</td>
</tr>
<tr>
<td>07 22 27 38</td>
<td>LMP</td>
<td>I'm planning to power back up the primary and shut down the secondary at 191 10.</td>
</tr>
<tr>
<td>07 22 27 44</td>
<td>CC</td>
<td>Roger. Copy that, and I have the morning news for you here.</td>
</tr>
<tr>
<td>07 22 27 55</td>
<td>LMP</td>
<td>Okay. Jack, go ahead with the news.</td>
</tr>
</tbody>
</table>
| 07 22 27 58 | CC   | Okay. Hurricane Gladys is cutting across northern Florida, will probably head back out into the Atlantic. Seventy-two airliners were backed up on the runways at Kennedy yesterday morning when the fog finally lifted. And in the Post this morning, there is a picture of Jo and
Harriet and Lo out in the early morning hours trying to spot your spacecraft as it went over. And there's been a big flap at the Olympics over a couple of black US athletes who made a racial protest while receiving their awards during the playing of the Star Spangled Banner. The Olympic Committee dismissed them. And Ohio State plays Northwestern today, and USC takes on Washington.

07 22 28 50 LMP We'll be standing by for the results.
07 22 28 52 CC Roger. We'll give them to you as soon as they come up.
07 22 32 52 LMP Hey, Jack, log the LMP with 25 clicks of water.
07 22 32 56 CC Roger. Another 25 clicks.

HULASVILLE (REV 120)

07 22 34 16 LMP Houston, Apollo 7. Over.
07 22 34 18 CC Go ahead, Apollo 7.
07 22 34 21 LMP Roger. Jack, log the LMP with 25 clicks of water, will you?
07 22 34 25 CC Roger. I copied that before.
07 22 34 28 LMP Okay. You might tell Virgil True, out at the Hawaii site, that we got a good picture of Hawaii a couple of days ago.
07 22 34 36 CC Okay. Will do.
07 22 34 42 CDR And Louis Wainwright has plenty of pictures of Carnarvon coming.
Copy that, Wally.

Jack, when you have a minute; on those movies
Walt was talking about --
Wally, I missed that.

Roger. On the movies we took on board --
Let's wait till we get -- we're over the Huntsville -- let's wait till we get through Guaymas
here, and I think you'll be a little clearer.

Very good.

Apollo 7, how do you read?

Very good, Jack.

Okay. You are loud and clear now, Wally.

The onboard movies.

Okay.

Okay.

Okay. Copied about the onboard movies.

Okay. I want tight clamps put on those until the crew gets to review them.

Roger. I have made a special note of that.

Very good. I think you can get Pete to back you there. On the S0368, the outside pictures of the rendezvous and of the earth: that's fair game for release.

Okay. Copy that.
07 22 37 20  CDR  There may be embarrassing - but I don't want people bothering something they don't know anything about all the goodies we took inside.

07 22 37 31  CC  I didn't get the last one, Wally.

07 22 37 34  CDR  I'm trying to avoid our inside pictures being misunderstood.

07 22 37 38  CC  Okay. Copy that.

07 22 37 40  CDR  There's nothing embarrassing about them. I just want to do them right before they release them.

07 22 37 43  CC  Okay.

07 22 37 45  CDR  Very good.

07 22 38 19  CC  Apollo 7, Houston.

07 22 38 58  CC  Apollo 7, Houston. We are ready to perform the keying test now.

07 22 39 15  LMP  Do you want ranging AUX ...

07 22 39 20  CC  Apollo 7, Houston. We are ready for the keying test.

07 22 39 37  CC  Apollo 7, Houston.

07 22 39 39  LMP  ...

07 22 39 41  CC  Okay. Walt, could you put your PMP power to AUX and your S-band normal PCM switch to KEY? Turn up your S-band volume, and we're ready for the keying test.

07 22 39 54  LMP  All done, Jack. I'm ready to key.

07 22 39 56  CC  Okay. Go ahead.

07 22 39 58  LMP  - .... - ... - .... -... -... -...
Okay. You got 100 percent today, and you can put your switches back to PCM and NORMAL.

Apollo 7, Houston.

Loud and clear.

Five-by. You might want to know how well the TV was received this morning. On all three networks, you replaced all the kiddie cartoons.

(Laughter) This is your Uncle Don.

As I recall, kiddie cartoons are on all three networks, though.

That's right; you replaced all three -- all the kiddie cartoons on all three networks.

That's pretty strong.

Frame 38, magazine R, is Dallas and frame 39 is the Mississippi River looking north.

Okay.

Forty is New Orleans, again.

Okay.

Forty was New Orleans; 41, Mobile.

Copy.

Is that hurricane still working?

Roger. Wally, it's inland now.

Yes, we have it in sight.

It looks like it's in the northeastern corner of Florida, and it's heading -- it looks like about 04 or 05 degrees.
07 22 46 36  CDR  We've got an eyeball on it --
07 22 46 37  CDR  We can tell you where it is probably better.
07 22 46 40  CC  I think you probably can.
07 22 46 57  CDR  It's pretty far north; I don't think there's much sense in giving you a mark on it.
07 22 47 01  CC  Roger.
07 22 47 12  CDR  Frame 42 is Gladys.
07 22 47 16  CC  Copy.
07 22 47 18  CDR  It's getting a lot bigger, but not as violent, I gather.
07 22 47 27  CC  Wally, it's got 60 knots now, and it's supposed to increase as it goes out into the Atlantic.
07 22 47 32  CDR  Ah, ha.
07 22 47 35  LMP  I assume that's well north of our track for 264-1?
07 22 47 41  CC  Affirm. We are really plotting that carefully.
07 22 47 44  CDR  Well, we are on our track right now, aren't we - for 264-1?
07 22 47 48  CDR  Roughly?
07 22 47 55  CC  Wally, 164-1 would have been a previous rev there.
07 22 48 01  CDR  So we're well south, yes?
07 22 48 03  CC  Roger.
07 22 48 05  CDR  I've got 260's on my mind, I guess.
07 22 48 08  CC  Roger.
07 22 48 12  CDR  We're trying to figure out whether we passed the duration of Gemini V yet.
07 22 48 21  CC  We're gonna look that up.
07 22 48 28 LMP How about a map update, Jack?
07 22 48 32 CC In work.
07 22 48 50 CC Okay. Walt, for REV 123: GET on the mode 19½ plus 50 plus 26, longitude will be 100.8 degrees east.
07 22 49 13 CDR Jack, we had an interesting picture of Dallas. Two aircraft apparently going over Dallas at six, and the contrails formed a wide open "v".
07 22 49 24 CC Roger. Copy.
07 22 49 27 LMP What was the time of that last map update - time?
07 22 49 30 CC Okay. 19½ plus 50 plus 26.
07 22 50 06 CC Wally, I'll give you a MARK when you exceed Gemini V. It's about 5 minutes from now.
07 22 50 12 CDR Very good.
07 22 50 26 CC You guys wouldn't want to try for Gemini VII would you?
07 22 50 29 CDR Negative. Negative. Is that Deke?
07 22 50 32 CC Yes.
07 22 50 34 CDR Did you get my story on the movies, Deke?
07 22 50 37 CC Negative. Jack is going to brief me on it now.
07 22 50 40 CDR Very good. Sounds like you have a cold.
07 22 50 42 CC Yes, either you've got mine or vice versa.
07 22 50 46 CDR (Laughter)
07 22 50 48 LMP We got six blocked ears up here.
07 22 50 51 CDR I'd like to have you talk to the guys about that reentry mode, Deke.
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<tr>
<td>07 22 50 59</td>
<td>CC</td>
<td>Roger. We've been discussing that one.</td>
</tr>
<tr>
<td>07 22 51 02</td>
<td>CDR</td>
<td>Very good. We're still pretty well stuffed up; I think the risk is greater on the ears than it is on the - no suits. We rehearsed in the couches this morning with the inflight coveralls, and we will wear our COMM carriers, of course; and we pitched down very well.</td>
</tr>
<tr>
<td>07 22 51 23</td>
<td>CC</td>
<td>Very good. I still think we would probably like to get the suit donning test at least some place along here.</td>
</tr>
<tr>
<td>07 22 51 28</td>
<td>CDR</td>
<td>I accept that, yes. We are really worried about our ears because of the - the problem getting the helmets off; then we really expect - big neck rings.</td>
</tr>
<tr>
<td>07 22 51 36</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 22 52 10</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>07 22 52 12</td>
<td>CC</td>
<td>Go ahead, 7.</td>
</tr>
<tr>
<td>07 22 52 13</td>
<td>CDR</td>
<td>Far as we can tell, this ... emergency radiator's working - you can call it secondary if you want. Should be no constraint for the next mission.</td>
</tr>
<tr>
<td>07 22 53 02</td>
<td>CC</td>
<td>Roger. We agree there.</td>
</tr>
<tr>
<td>07 22 53 05</td>
<td>CDR</td>
<td>Our VERBS are coming very well.</td>
</tr>
<tr>
<td>07 22 53 10</td>
<td>CC</td>
<td>It sure looked like from down here watching the data.</td>
</tr>
<tr>
<td>07 22 53 13</td>
<td>CDR</td>
<td>Good.</td>
</tr>
<tr>
<td>07 22 53 19</td>
<td>LMP</td>
<td>We've actually been cooler because the evaporator has been running more and controlling the lower glycol temperature.</td>
</tr>
</tbody>
</table>
07 22 53 26 CC Roger. Copy that.
07 22 53 33 CDR According to the update computer, the update took us about 5 minutes ...
07 22 53 47 CC 7, opposite omni. We didn't copy that last one, Wally.
07 22 53 50 CDR The computer: it took us about 5 minutes just to update it.
07 22 53 56 CC Okay. We got that. Walt, when you bring the primary evaporator back on the line here, we would like to have you open the back pressure valve for 2 seconds, monitor the steam pressure in the EVAP OUT temperature for 30 seconds, then go to AUTO.
07 22 54 17 LMP Wilco.
07 22 54 53 CC Walt, can you confirm you PMF power switch in NORMAL?
07 22 55 01 LMP Okay.
07 22 55 20 CC Apollo 7.
07 22 55 21 CC MARK.
07 22 55 22 CC You're now flying longer than Gemini VIII.
07 22 55 26 CDR Roger. I guess we got 2 more man hours; that will take over 9 days. And I'm not sure how our compatriots stack up for total man hours.
07 22 55 40 CC Roger. Copy that. I made a mistake; that's Gemini V; I said Gemini VIII.
07 22 55 46 CDR No contest.
<table>
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<th>Time</th>
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<th>Text</th>
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</thead>
<tbody>
<tr>
<td>07 23 02 01</td>
<td>CC</td>
<td>Apollo 7, Houston through Ascension.</td>
</tr>
<tr>
<td>07 23 02 05</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 23 04 02</td>
<td>CC</td>
<td>Opposite omni, 7.</td>
</tr>
<tr>
<td>07 23 04 07</td>
<td>CDR</td>
<td>Roger.</td>
</tr>
<tr>
<td>07 23 09 11</td>
<td>CC</td>
<td>Apollo 7, 1 minute LOS Ascension; we will pick you up at Tananarive at 18.</td>
</tr>
<tr>
<td>07 23 09 17</td>
<td>LMP</td>
<td>Roger. Eighteen. And you have got an echo on that one.</td>
</tr>
<tr>
<td>07 23 09 24</td>
<td>LMP</td>
<td>Who is UCLA playing today, Jack?</td>
</tr>
<tr>
<td>07 23 09 27</td>
<td>CC</td>
<td>Stand by.</td>
</tr>
<tr>
<td>07 23 09 32</td>
<td>CDR</td>
<td>Check Standford, too, please.</td>
</tr>
<tr>
<td>07 23 19 25</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive.</td>
</tr>
<tr>
<td>07 23 25 27</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS Tananarive. Carnarvon at 33.</td>
</tr>
<tr>
<td>07 23 33 57</td>
<td>CC</td>
<td>Apollo 7, Houston through Carnarvon.</td>
</tr>
<tr>
<td>07 23 34 02</td>
<td>LMP</td>
<td>Roger, Jack. Hey, Jack, I'd like to make note of something. I've noticed on numerous occasions since the beginning of the flight that we can see, quite plainly, the Magellanic clouds in the southern latitudes.</td>
</tr>
<tr>
<td>07 23 34 20</td>
<td>CC</td>
<td>Roger. Copy that.</td>
</tr>
<tr>
<td>07 23 34 23</td>
<td>LMP</td>
<td>I don't believe they have ever been spotted up here before.</td>
</tr>
</tbody>
</table>
Okay. Walt, we have got a NAV vector we would like to send you, and if you will go to ACCEPT - and also I have a NAV check for you.

We got to get the computer up first.

Oh, man, I though you were powered up.

We will bring it shortly.

I'll copy the PAD reference. Go ahead, what is it?

Okay. The NAV check PAD, the time, 193 plus 10 plus 0000 minus 1829 plus 09189 2400.

Roger. Say again the time, please.

Roger. 193 plus 10 plus four balls.

193 100000 minus 1829 plus 09189 2400. Over.

Roger. That is correct, Walt.

We might not be able to get state vector in the computer until the next station, Jack.

Hey, Walt, could you reverify the NAV check time you read back to me?

Apollo 7, opposite omni.

- In POO; now waiting to catch up the state vector.

Roger. Stand by.

Okay. Jack, are you going to have time to send the state vector up?

Roger, Walt. We've got about 4 and 1/2 minutes left here with you at Carnarvon.

Okay. We are in ACCEPT. Send your message.
07 23 39 31  CC  Coming up.
07 23 39 47  CC  And, Walt, I have a T align time here for P54 to give you.
07 23 39 54  LMP  Roger. Go ahead.
07 23 39 56  CC  Roger. That's 193 plus 40. That is the T align for P54. We would not like you to key in this time prior to performing P53, though.
07 23 40 10  LMP  Roger. Will load 193 plus 40 plus 00 after performing P53?
07 23 40 15  CC  Copy that.
07 23 40 21  CC  And, Walt, did you get the flight plan update to perform P52 IMU realign option 3 after the P54?
07 23 40 33  LMP  Affirmative.
07 23 40 34  CC  Okay. Could you record the star angle differences and the gyro torquing angles for us?
07 23 40 39  LMP  Wilco.
07 23 40 40  CC  Thank you.
07 23 40 41  LMP  On the P52.
07 23 40 45  CC  7, the NAV update is finished; the computer is yours.
07 23 41 50  LMP  NAV --
07 23 41 53  CC  Go ahead, 7.
07 23 42 04  LMP  NAV check is GO.
07 23 42 05  CC  Roger. We verify.
07 23 42 16  CC  Walt, can you confirm that inverter 3 is now off?
07 23 42 22  LMP  No, I'm going to turn it off.
<table>
<thead>
<tr>
<th>Time</th>
<th>Operator</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>07 23 42 32</td>
<td>LMP</td>
<td>Okay. Everything else is back in configuration, as before the secondary cold loop test. The primary evaporator did cycle down and operate for awhile.</td>
</tr>
<tr>
<td>07 23 42 42</td>
<td>CC</td>
<td>Okay. Copy that.</td>
</tr>
<tr>
<td>07 23 42 44</td>
<td>LMP</td>
<td>Do you want to leave the primary evaporator on the line?</td>
</tr>
<tr>
<td>07 23 42 51</td>
<td>CC</td>
<td>Affirmative, Walt.</td>
</tr>
<tr>
<td>07 23 42 54</td>
<td>LMP</td>
<td>Okay. It will probably end up drying out again.</td>
</tr>
<tr>
<td>07 23 42 56</td>
<td>CC</td>
<td>Okay. We are about 1 minute LOS Carnarvon here. We pick you up at Guam - well, we won't get you there at Guam. It's too short a pass. We will pick you up at Hawaii on the hour.</td>
</tr>
<tr>
<td>07 23 43 11</td>
<td>LMP</td>
<td>Okay. And you notice that fuel cell 2 seems to have stabilized out right at the caution and warning trigger line.</td>
</tr>
<tr>
<td>07 23 43 19</td>
<td>CC</td>
<td>Roger. We are following that real close.</td>
</tr>
<tr>
<td>07 23 47 37</td>
<td>CC</td>
<td>GUAM (REV 121) Apollo 7, Houston through Guam.</td>
</tr>
<tr>
<td>07 23 47 41</td>
<td>SC</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>07 23 47 43</td>
<td>CC</td>
<td>Roger. It was my error; we got you for about 8 minutes here.</td>
</tr>
<tr>
<td>07 23 47 50</td>
<td>SC</td>
<td>You can have it.</td>
</tr>
<tr>
<td>07 23 54 07</td>
<td>CC</td>
<td>Apollo 7, 1 minute LOS Guam; Hawaii on the hour.</td>
</tr>
</tbody>
</table>
HAWAII through ANTIGUA (REV 121)

08 00 00 57 CC Apollo 7, Houston through Hawaii.
08 00 01 00 CDR Roger.
08 00 05 21 CC Apollo 7, Houston.
08 00 05 23 CDR Go ahead.
08 00 05 25 CC On some questions earlier: UCLA plays Calif. today, and Navy plays Pitt.
08 00 05 34 CDR Roger. Thank you. What about that ole school of yours?
08 00 05 42 CC Oh, I didn't think that would interest you - and on this relay test that we are going to do over Guaymas: when we get Guaymas AOS, I'll tell you to go the relay mode per the COMM slide rule, and then we will conduct it then.
08 00 06 07 LMP Okay.
08 00 07 29 SC Hey, Jack. Are you going to be sending up VHF and receiving S-band or vice versa?
08 00 07 38 CC We're sending up VHF and receiving S-band.
08 00 07 42 LMP Okay. Then I'll set Donn's panel up with VHF OFF and S-band TR, right?
08 00 07 51 CC No - stand by.
08 00 07 54 LMP Our slide rule is set up for you sending - for you receiving S-band and receiving VHF.
08 00 08 09 CC Walt, the configuration we want is exactly the same one on the COMM slide rule there.
08 00 08 15 LMP Okay.
08 00 13 25 CC Apollo 7, Houston.
08 00 13 28 CDR Go ahead.
08 00 13 29 CC Wally, in view of the attitude problem – display that you had on ball number 1 yesterday, we would like you to leave the FDAL select switch in the one-half position for the remainder of the flight.
08 00 13 48 CDR (Laughter) You'd have a ball of a time talking me into doing that run again; I'll clue you. I may troubleshoot it a couple of times.
08 00 13 56 CC Okay.
08 00 13 58 CDR ... data very well.
08 00 14 04 CC Well, we're just looking at it, and we don't want anything to happen and lose the display on reentry.
08 00 14 09 CDR Right. Quit while we're ahead. I've already considered not using ORDEAL on number 2 ball. I'll probably fly it that way.
08 00 14 16 CC Okay.
08 00 14 17 CDR Use GDC number 2 on reentry.
08 00 14 20 CC All right.
08 00 14 29 CC Apollo 7, we are ready to perform the relay test. Would you configure per the COMM slide rule for relay mode?
08 00 14 37 CDR Roger.
08 00 15 23 SC Houston, Apollo 7.
08 00 15 27 CC Go ahead, 7.
08 00 15 28 SC They are configured.
Okay. Apollo 7, this is Houston on S-band for the USB relay test.

Apollo 7, Houston. Performing the relay test: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1. Okay, Apollo 7, the relay test is complete. It was an outstanding success. You can return to your normal COMM configuration.

Roger.

Houston, Apollo 7. How do you read?

Reading you five-by, Walt.

And, Walt, I have your block data number 21 when you are ready to copy it.

Go ahead, Jack.


Readback follows: 123 dash 4 Alfa plus 295 minus 1620 194 plus 50 plus 142813, 124 dash 4 Alfa plus 250 minus 1635 196 plus 31 plus 45 3012, 125 dash Charlie Charlie plus 168 minus 1660 198
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Roger. That's correct, Walt.

HAWAII through ANTIGUA (REV 122)

08 00 28 58 LMP Houston, Apollo 7.
08 00 29 01 CC Go ahead, 7.
08 00 29 02 LMP I do have the command module RCS temperatures about an hour ago. All six were reading 5 volts.
08 00 29 09 CC Roger. Thanks, Walt.
08 00 30 32 CC Apollo 7, Houston. We are 1 minute before Antigua; pick you up at Ascension at 38.
08 00 30 40 CDR Roger.

ASCENSION (REV 122)

08 00 38 55 CC Apollo 7, Houston through Ascension. Standing by.
08 00 39 46 CC Apollo 7, Houston through Ascension. Standing by.
08 00 40 28 CDR I read you loud and clear.
08 00 40 30 CC Roger, Wally.
08 00 41 30 LMP Houston, Apollo 7.
08 00 41 32 CC Go ahead, Apollo 7.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Caller</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 00 41 35</td>
<td>IMP</td>
<td>Roger</td>
<td>Magazine Victor, frames 12, 13, and 14 were of cloud cover, my present position, taken with the red filter on.</td>
</tr>
<tr>
<td>08 00 41 51</td>
<td>CC</td>
<td></td>
<td>Copy that.</td>
</tr>
<tr>
<td>08 00 41 52</td>
<td>IMP</td>
<td></td>
<td>We have more Panatomic-X on board than we're going to be able to use for the multispectral stuff. Could you check and find out with the weather people if they would like to have black and white weather pictures with the red filter on or the red filter off? It's a very thin red filter.</td>
</tr>
<tr>
<td>08 00 42 12</td>
<td>CC</td>
<td></td>
<td>Okay. It is in work.</td>
</tr>
<tr>
<td>08 00 42 17</td>
<td>IMP</td>
<td></td>
<td>331 000 50 dash 204. There's a Hasselblad 50 series.</td>
</tr>
<tr>
<td>08 00 42 29</td>
<td>CC</td>
<td></td>
<td>Okay.</td>
</tr>
<tr>
<td>08 00 42 33</td>
<td>CDR</td>
<td></td>
<td>Jack, you better check with Helmut Kuehnel on the color correction for that. It sounds like a pretty good ... but it may be pretty hard.</td>
</tr>
<tr>
<td>08 00 42 42</td>
<td>CC</td>
<td></td>
<td>Okay, Wally.</td>
</tr>
<tr>
<td>08 00 42 58</td>
<td>CDR</td>
<td></td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>08 00 43 02</td>
<td>CC</td>
<td></td>
<td>Go ahead, 7.</td>
</tr>
<tr>
<td>08 00 44 04</td>
<td>CDR</td>
<td></td>
<td>Roger. The COAS is just barely bright enough for tracking against the clouds. I am not sure it would be acceptable.</td>
</tr>
<tr>
<td>08 00 44 17</td>
<td>CC</td>
<td></td>
<td>I didn't get the first part, Wally.</td>
</tr>
</tbody>
</table>
The COAS for ... It's so bright it just barely shows. I'm not sure it's bright enough for tracking various objects.

Okay.

7, we're 1 minute LOS Ascension; we pick up Tanararive at 54.

Roger.

TANARARIVE (REV 122)

Apollo 7, Houston through Tanararive.

Roger.

Wally, on your question on Panatomic-X film and the red filter: weather says that they agree with your decision to use this film photographing clouds with the red filter on there. They do request that land, water, and clouds be included in the pictures that you take.

Roger. ...

I couldn't copy that, Wally.

We had to eliminate all the ...

We couldn't copy that, Wally. We will pick you up over Guam here.

Apollo 7, Houston. One minute LOS Tanararive; we will pick you up at Carnarvon at 10.

CARNARVON (REV 122)

Apollo 7, Houston through Carnarvon. Standing by.
08 01 13 19  CDR  stand by.
08 01 16 46  CC  Apollo 7, 1 minute LOS Carnarvon; Guam at 21.
08 01 16 51  CDR  Roger ...
08 01 16 55  CC  Roger. Copy that.
08 01 16 59  CDR  You are reading our DSKY, I assume. Did you get
the stars and the distance on program 53?
08 01 17 06  CC  Negative, Wally. You went through that before
we had data.
08 01 17 10  CDR  Okay. Three balls 18.
08 01 17 13  CC  Copy.

         GUAM (REV 122)
08 01 23 52  CC  Apollo 7, Houston through Guam.
08 01 23 56  CDR  Roger. We're playing program 52 to now check
our error.
08 01 24 03  CC  Okay, Wally.
08 01 24 05  CDR  The star angle difference in 54 was three balls
26, and the torquing angles we put on the tape —
they were like two balls 8 something, two balls
8 something, two balls 9 something.
08 01 24 19  CC  Roger.
08 01 24 21  CDR  So we'll see what we really have now. Used
Alpheratz and Pomalhaut.
08 01 24 30  CC  Okay.
08 01 24 37  CDR  We needed to use Sirius or Orion this time.
08 01 24 41  CC  Roger.
08 01 26 21  CC  Apollo 7, Houston.
08 01 26 23  CDR  Roger.
08 01 26 25  CC  Wally, what option did you select when you did P52?
08 01 26 34  CDR  We took two.
08 01 26 41  LMP  Star angle difference four balls 1, torquing angles are minus two balls 199, plus three balls 64, plus three balls 93.
08 01 27 00  CDR  Will that do me on?
08 01 27 05  CC  Stand by one.
08 01 27 07  CDR  That's about two-tenths of a degree off.
08 01 27 11  CC  Copy.
08 01 27 14  CDR  I hope once and for all we have indicated what the heck a COAS is for.
08 01 27 20  CC  Roger. Wally, just a minute; we are having some discussion down here.
08 01 27 24  CDR  If you have a check, we are off about two-tenths of a degree.
08 01 27 27  CC  Roger.
08 01 27 31  LMP  Did you copy my gyro torquing angles I read down?
08 01 27 34  CC  Affirmative, Walt.
08 01 28 22  CC  Apollo 7, Houston.
08 01 28 30  CC  Apollo 7, Houston.
08 01 28 33  CDR  Go ahead, Jack.
08 01 28 34  CC  Okay. Wally, we are having some discussion down here on whether we need to redo that P52, so we are requesting that you do not power down until
we get back to you. Secondly, we would like you now to switch to the secondary tanks on quad Delt Roger.

08 01 28 52 CDR Okay. And while you are up there, could you give me a batt C voltage readout?

06 01 28 54 CC Jack, we are kind of blacked out up here if you could hold on that one.

06 01 29 03 CDR Okay. No problem; there is no hurry.

06 01 29 06 CC Okay.

06 01 29 08 CDR Okay.

06 01 30 36 CC Apol's 7, Houston.

06 01 30 39 CDR Go ahead.

06 01 30 40 CC Roger. Wally, just a minute.

06 01 30 45 CDR Our navigator is arguing with that three violently up here. Soon as you get his headset on, he will start talking.

06 01 30 52 CC Okay.

06 01 30 54 LMP You reading my DSKY?

06 01 30 59 CC Roger. Four balls 1.

08 01 31 02 LMP Okay. I'm just doing a fine align check. I won't read them out to you then.

06 01 31 05 CC Okay. Just going over the hill here. The brown material that you see there and the subsequent salt development was observed on 2TV-1. What we are doing is recommending that the material be wiped off the injector and wiping cloth stowed for observation when you get back down
and the chlorination proceed as per scheduled in the flight plan.

08 01 31 30 CDR Okay. We note it crystallized out today. It is a white powder all over the place. I suspect that this stuff is inside the plumbing, too.

08 01 31 42 CC Roger. Copy that.

HAWAII through GOLDSTONE (REV 122)

08 01 37 26 CC Apollo 7, Houston through Hawaii.

08 01 37 31 CDR Roger, Houston.

08 01 37 33 CC Roger. Wally, we've looked at the data, and you can proceed with the power down...

08 01 37 39 CDR Roger.

08 01 37 40 CMP Did you get the reason I'm doing the option 2 instead of 3 in 52?

08 01 37 46 CC Negative, Donn. I guess you went over the hill too fast.

08 01 37 53 CMP Well, the reason I did that - see, if we done a three, all we would have done is find a line to the REFSMMAT determined in 54. That wouldn't tell you how accurate 54 was. It might give you some idea on how accurate the star difference angle was, but you would get - by doing 52 option 2, I got a comparison. There is a gyro torque angle in program 52 option 2, represent the error between it and the one determined in 54.
<table>
<thead>
<tr>
<th>Time</th>
<th>Identifier</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 01 38 31</td>
<td>CC</td>
<td>Okay, Donna. We're discussing that down here.</td>
</tr>
<tr>
<td>08 01 38 34</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>08 01 38 38</td>
<td>CC</td>
<td>Opposite omni, 7.</td>
</tr>
<tr>
<td>08 01 38 43</td>
<td>CDR</td>
<td>Jack, do you understand Donna's logic there?</td>
</tr>
<tr>
<td>08 01 38 50</td>
<td>CC</td>
<td>We've got all of the data we need, Wally. There's some discussion on that going back and forth here, but we've got all of the data we need.</td>
</tr>
<tr>
<td>08 01 38 57</td>
<td>CDR</td>
<td>Okay. Just have them check the REFSMAT we got out of 54 - the REFSMAT we compared to 52, and the technique you have with option 2 and 3 on 52.</td>
</tr>
<tr>
<td>08 01 39 12</td>
<td>CC</td>
<td>I see some shaking of the heads, but we copy.</td>
</tr>
<tr>
<td>08 01 39 15</td>
<td>CMP</td>
<td>Hey, Jack, before we quit, I did do an option 3 on that thing.</td>
</tr>
<tr>
<td>08 01 39 24</td>
<td>CC</td>
<td>When did you do the option 3?</td>
</tr>
<tr>
<td>08 01 39 27</td>
<td>CMP</td>
<td>After the two option 2's.</td>
</tr>
<tr>
<td>08 01 39 31</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>08 01 39 32</td>
<td>CDR</td>
<td>It's academic to the problem.</td>
</tr>
<tr>
<td>08 01 39 35</td>
<td>CC</td>
<td>Okay. Could you give me a batt C voltage readout when you get a minute? And I have a flight plan update here.</td>
</tr>
<tr>
<td>08 01 39 47</td>
<td>LMP</td>
<td>Batt C is 36.0.</td>
</tr>
<tr>
<td>08 01 39 49</td>
<td>CC</td>
<td>Copy.</td>
</tr>
<tr>
<td>08 01 39 50</td>
<td>CDR</td>
<td>Go ahead with your flight plan update.</td>
</tr>
<tr>
<td>08 01 39 53</td>
<td>CC</td>
<td>Okay. We want to do a fuel cell O₂ purge at 195 plus 00.</td>
</tr>
</tbody>
</table>
Roger. Proceed.

Okay. That's it.

Okay.

Apollo 7, we would like you to delay the power down. We're going to have a NAV load for you.

Going too slow. Our computer's still going—going around; the DMU's going.

Okay. We'll be ready for you in just a minute. Wally, I would like to get some feel from you on how long you think it would take you to doff suits.

To doff the suits?

Roger.

What's the occasion? You have to explain the reasoning behind our doff. I can cut it off, or I can take it off.

Roger. When you were inserted and you got—you doffed the suits, about how long do you figure it took you to take them off and stow them?

Oh, you mean as we started the mission?

Affirmative.

Yes, because there's where you're taking the suit off to protect it, and you put it away very carefully. I'd say it took about 30 to 35 minutes.
Okay. Copy that.

Wait a minute; wait a minute.

Well, Jack, what we did: we did it in stages. We took the helmets and gloves off after early GO, and then the suits off after seventeenth or sixteenth one.

Wally, could you go to ACCEPT, and we'll send this load up?

We're going to get squared away on this in just a second.

Okay.

We'll get POO straightened up, and you can have it.

You've got it now, Jack.

Okay. Coming up. I'll read you the NAV check when you are ready.

Okay.

Go ahead on the NAV check.

Okay. Time: 199 plus 30 plus four balls plus 1589 plus 05853 1875.

Roger.

Apollo 7, Houston.

Go ahead.

Roger. We would like you to stand by on any power down till we pick you up in Guaymas.

We've already powered-down, Jack. Do you want me to bring it back up?
08 01 44 09  CC  Negative. We didn't quite finish the NAV load. We want to pick it up here at Guaymas.
08 01 44 13  CDR  Okay. The computer is still going, still going.
08 01 44 16  CC  Okay.
08 01 44 17  CDR  We'll keep the computer going.
08 01 44 19  CC  Roger.
08 01 49 21  CC  Apollo 7, Houston.
08 01 49 24  CDR  Go ahead, Jack.
08 01 49 25  CC  Okay. We verified the load that we sent up, and the computer is yours; you can go ahead and begin powering down.
08 01 49 32  CDR  Okay.
08 01 50 26  CDR  Okay. Jack, we buy it.
08 01 50 29  CC  Okay. Roger. Good news.
08 01 55 36  CC  Apollo 7, Houston. One minute LOS Texas; Ascension at 17.
08 01 55 42  CDR  Roger.
08 02 17 28  CC  Apollo 7, Houston through Ascension.
08 02 17 32  CDR  Roger, League City. Loud and clear.
08 02 17 37  CC  Wally, you're loud and clear, also.
08 02 17 40  CDR  Roger.
08 02 17 53  CC  Wally, one point: because of the visibility problem that we've had in window number 3, if
you'd like, we have some simple instructions which would provide you with 55- and 90-degree roll lines on window number 2.

It's cleared up enough to where we can ... the center the last couple of days. But we can live with it. We can't shoot pictures out of it or see detail out of it.

Okay. Real fine. Copy that.

Are we on FM?

We're transmitting both.

Okay. What is satisfactory for bank angles on reentry?

Okay. Copy that, Wally.

We're 40 seconds LOS Ascension; we pick up Tananarive at 29.

Roger.

Apollo 7, Houston through Tananarive. Standing by.

... through Tananarive yet?

Say again.

Checking to see if you could hear through Tananarive.

Roger. We are reading you five-by.

It's dinner time here.

Apollo 7, Houston. One minute LOS Tananarive; the Mercury at 54.
08 02 39 20  CDR  Thank you.

MERCURY (REV 123)

08 02 55 16  CC  Apollo 7, Houston through the Mercury. Standing by.

08 02 55 20  LMP  Roger, Jack.

08 02 57 30  CC  Apollo 7, opposite omni.

08 02 59 28  LMP  Hey, Jack, are you still there?

08 02 59 31  CC  Roger. Walt, go ahead.

08 02 59 34  LMP  Roger. If you get a chance, maybe we could get an updated RCS number for our chart.

08 02 59 39  CC  Okay. In work.

GUAM (REV 123)

08 03 03 22  CC  Apollo 7, Houston.

08 03 03 24  LMP  Go ahead, Jack.

08 03 03 26  CC  Roger. Your chart value for RCS today, Walt, is 588. It shows a little bit larger usage than we expected, and we can't account for it at this time. We're going back over the data and looking at it.

08 03 03 43  LMP  Roger.

08 03 04 21  CC  Apollo 7, Houston.

08 03 04 23  LMP  Go ahead, Jack.

08 03 04 25  CC  Just for the record, you might help us out and give us some clues about how much you think you used today.
Oh, I don't really know - I think all we did was - we didn't do any ... around. The pictures: we probably used a pulse or two on that. We did the alignments and did a little maneuvering then and then the maneuverings of the alignments.

Okay. Copy that. We're about 1 minute LOS Guam; we'll pick up Hawaii at 13.

Roger.

HAWAII (REV 123)

Apollo 7, Houston through Hawaii. Standing by.

Roger. Jack, need a map update if you can get it, and I'd just as soon have one that's not two revs ahead, if you can get it.

Sure can. In work.

I took a weather picture at 195 hours and 13 minutes, magazine V as in Victor, frame number 14.

Okay. Copy that, Walt. When would you like the map update? This rev?

Yes, the next ascending node if you have it.

Okay. Stand by. Okay, Walt. The GET of the next ascending node, REV 124 will be 196 plus 20 plus 48 with a longitude of 7.77 degrees east.

Roger.

HUNTSVILLE (REV 123)

Apollo 7, Houston. One minute LOS Huntsville; Tananarive at 196 plus 05.
08 03 24 17 IMP Thank you.

TANANARIVE (REV 124)

08 04 05 52 CC Apollo 7, Houston through Tananarive. Standing by.

08 04 06 41 CC Apollo 7, Houston through Tananarive. Standing by.

08 04 15 12 CC Apollo 7, Houston. One minute LOS Tananarive; Mercury at 30.

MERCURY (REV 124)

08 04 30 31 CC Apollo 7, Houston through the Mercury. Standing by.

08 04 30 36 IMP Roger. Jack, we've got a readout on our O₂ manifold pressure.

08 04 30 44 CC Walt, we don't have data yet from the Mercury. Stand by.

08 04 31 06 CDR Houston, Apollo 7.

08 04 31 09 CC Go ahead, Wally.

08 04 31 11 CDR I assume from the radar transponder test that we successfully completed - that we do not require doing that again. Is that correct? Are we going to back up in case the first one fails?

08 04 31 28 CC Wally, you are correct there in that assumption. We're going to have a general update on tomorrow's activities for you over Hawaii.

08 04 31 37 CDR Okay.
08 04 32 01 CC Apollo 7, Houston. Opposite omni.
08 04 32 05 CDR Roger.
08 04 33 13 CC Apollo 7, Houston. We're ready to read that out, the O₂ manifold pressure out.
08 04 33 18 LMP What do you have?
08 04 33 20 CC We have 102 now.
08 04 33 27 LMP Okay. Try again.
08 04 33 29 CC Roger. 105.
08 04 33 32 LMP Have you done the component check as GO?
08 04 33 46 CC Roger.

GUAM (REV 12h)
08 04 36 01 CC Apollo 7, opposite omni.
08 04 38 32 CC Apollo 7, Houston. One minute LOS Guam; Hawaii at 49.
08 04 38 39 LMP Roger, Jack.
08 04 38 54 LMP What are you going to do with your weekend, Jack?
08 04 38 57 CC Oh, I think I'll just hang around mission control.
08 04 39 03 LMP They'll give you a lot to do.

HAWAII through HUNTSVILLE (REV 12h)
08 04 49 26 CC Apollo 7, Houston through Hawaii.
08 04 49 31 LMP Thanks, Jack.
08 04 49 42 LMP Hey, Jack, give the LMP 15 clicks of water.
08 04 49 46 CC Okay. I am logging that, Walt. Is Wally monitoring?
08 04 49 55 LMP Yes, he's monitoring.
Okay. Just generally, on tomorrow's activities: we are going to tailor them to accomplish the objectives based on what we know to date. We are going to remain above the service module RCS DAP redline, and we'll curtail any activities to remain so. Basically, what we are going to do, and this is generally, because the exact times they are still working on. We are going to delete the rendezvous radar test during tomorrow; we are going to perform burn 6 as per the normal flight plan, and in that period from 211 to 219, we are going to have the following four activities: two revs of orbital navigation, using the 9-by-9 W matrix; one PTC - it will be just like the preceding test except it will be about the pitch axis there; we are going to do the pitch instead of a roll - and one P22 horizon sighting test for horizon definition and generally for the television tomorrow.

Basically, with the activities that are planned, we felt that if you just turn it on and proceed with your regular flight plan activities, that would be fine.

Okay. We'll have it mounted above the tunnel and just let it go.

Okay. And some information has come about the discussion on the reentry configuration. Right
now, the thinking is to have the suits on for entry, to provide a heel of restraint. The helmets and glove question is still in question.

Hey, now that's pretty immature; we were going to launch without that kind of special heel restraint. And then all of a sudden, they got worried about land landing, and they put it in. If you are worried about a water landing for heel restraint, we got a long way to go before we can call this thing a flying machine.

Hey, Wally.

Yes.

You did have heel restraint before, anyway, and I think the only concern here is that if you do get a tumbling even on the water, your legs can end up flailing around, and that clearance between your knees and the MDC, as you remember, has always been a bit of a concern. Think it's just an attempt here to make darn sure you don't have some leg damage is all.

Yes, but how about our heads? With that neck ring laying out there, we don't fit the couch too well.

I missed that one.

We intended to fix the headrest to prop our heads in, and without a helmet, we're pretty
floppy on the head part, which you'll expect on any kind of landing.

08 04 53 08  CC  Okay. Well, yes, I think you got to be able to clear your ears, and whatever is the best way to do that, obviously we are going to have to do.

08 04 53 14  CDR  Yes, we are in trouble on the ears, Deke; no way out of that.

08 04 53 19  CC  I think as far as what happens from 10 000 feet on down, we need to discuss in some more detail.

08 04 53 26  CDR  Yes.

08 04 53 28  CC  Okay. We'll think about --

08 04 53 29  CDR  We bought the cabin a long time ago, so we're not worried about it.

08 04 53 34  CC  Yes, nobody else is either; that's not the concern.

08 04 53 38  CDR  Yes, I take it it's the foot restraint you are worried about.

08 04 53 41  CC  That's affirmative; that's the only concern, is your legs rattling around down there.

08 04 53 45  CDR  Yes.

08 04 53 46  CC  You might give that one some thought, because we've talked that one around previously as you remember.

08 04 53 51  CDR  Right. I should have prepared for something like this, but I didn't expect a cold. We
might tape our feet to the foot restraints; that's about all I can think of. We've got a lot of tape left up here. That doesn't sound like too easy a job, but it is really easy at zero g. We could cut the tape off with our surgical scissors when we land.

Yes.

Deke, kick that one around, anyway.

That doesn't sound too great, Wally.

Say again.

That doesn't sound too great; you can think of lots of contingencies that that would give you real trouble with.

What, getting our feet out?

Yes.

We don't have to settle it today, but I think you ought to be thinking about it. I think the prime concern here is ending up with some broken kneecaps, and that sort of thing, which you are well aware of the arguments there. And I guess you prefer to have a couple of good ones to walk off on.

Yes, right. I know it's taken me 3 or 4 weeks at least to get away from a bad case of ears and all three of us have those.

Yes, and --
I'm afraid that we can't wear the helmets down; that's the first conclusion. And whether they come off at 10 000 or where we are right now is rather academic.

Okay. Well, I guess — well, we've been thinking to clear the air on this one a bit, is that you probably ought to don the suits in any case, and have the heel protection — okay. Then the question of whether you put helmets on and where you release them; whether you can clear your nose with it on, and not tied to the neck ring or off. I think that's all subject to some discussion. You guys got a better feel for that than anybody else.

Okay. ... we've been thinking about this for a week.

We're about at LOS; we'll have to carry this on at some later date.

Okay. We'll work on it.

Apollo 7, Houston. One minute LOS Huntsville; Tananarive at 42.

Roger.

Huntsville LOS.

TANANARIVE (REV 125)

Apollo 7, Houston. Tananarive standing by.

Good afternoon.
08 05 44 28  CDR  ...  
08 05 49 55  CC  Apollo 7, Houston. One minute LOS; Mercury at 06.
08 05 50 00  CDR  Okay.
MERCURY (REV 125)
08 06 06 48  CC  Apollo 7, Houston through Mercury. Standing by.
08 06 06 53  CDR  Roger. Loud and clear.
08 06 06 54  CC  Roger. The same.
08 06 07 10  CC  Apollo 7, Houston. Opposite omni.
08 06 13 24  CC  Apollo 7, Houston. One minute LOS; Hawaii 25.
08 06 13 29  CDR  Roger.
HAWAII (REV 125)
08 06 25 38  CC  Apollo 7, Houston through Hawaii. Standing by.
08 06 25 42  CMP  Hello, Bill.
08 06 25 44  CC  Good morning.
08 06 25 47  CMP  How are you?
08 06 25 49  CC  Great. You're getting up earlier and earlier.
08 06 25 52  CMP  Sure seems like it. What time is it?
08 06 25 56  CC  It's 4:30.
08 06 25 58  CMP  Say again.
08 06 26 00  CC  16 30.
08 06 26 02  CMP  Okay. Got you. I thought so but wasn't sure.
08 06 26 15  CC  Apollo 7, Houston. Opposite omni.
08 06 26 18  CMP  Roger. Opposite omni.
08 06 26 27  CMP  Hello, Ron, log ten clicks of water for CDR and five clicks for IMP.
08 06 26 34  CC  Roger.
08 06 26 35  CMP  And log me 7 hours of very fine sound sleep.
08 06 26 40  CC  Hey, great.
08 06 27 02  CC  Apollo 7, Houston.
08 06 27 05  CMP  Go.
08 06 27 07  CC  Roger. Request O₂ tank 2 fan on for 5 minutes, then off.
08 06 27 14  CMP  Okay. It's on.
08 06 30 38  CC  LOS; Redstone 40.
08 06 30 40  CMP  Okay.

REDSTONE (REV 125)
08 06 41 08  CC  Apollo 7, Houston through Redstone. Standing by.
08 06 41 13  CMP  Roger, Houston.
08 06 41 15  CC  Roger. Loud and clear.
08 06 44 30  CC  Apollo 7, Houston.
08 06 44 34  CMP  Go, Houston.
08 06 44 36  CC  Roger. Verify O₂ tank 2 fan OFF.
08 06 44 42  CMP  Roger. It's still ON; I'll get it in a minute.
08 06 44 44  CC  Roger.
08 06 45 22  CC  Apollo 7, Houston. One minute LOS; Ascension at 05.

ASCENSION (REV 126)
08 07 07 18  CC  Apollo 7, Houston through Ascension. Standing by.
08 07 12 08  CC  Apollo 7, Houston. One minute LOS; Mercury at 42.
08 07 12 14  CMP  Roger.
     MERCURY (REV 126)
08 07 43 33  CC  Apollo 7, Houston through Mercury. Standing by.
08 07 43 38  CMP  Hello, Houston, Apollo 7.
08 07 43 41  CC  Roger. Loud and clear.
08 07 45 20  CMP  Got any ball score yet?
08 07 45 24  CC  Roger. Would you believe Kansas beat Oklahoma
                 State 28 to 6?
08 07 45 31  CMP  I see.
08 07 45 36  CC  Oklahoma beat Iowa State 42 to 7.
08 07 46 05  CMP  How did Houston and Rice do?
08 07 46 10  CC  Haven't got - don't have that one yet, Donn;
                 we're working on it.
08 07 46 14  CMP  I see.
08 07 46 19  CMP  Have you got Southern Cal and Ohio State?
08 07 46 25  CC  Not yet. Got Tennesse 10, Alabama 9; Georgia
                 Tech 21 and Auburn 20.
08 07 46 36  CMP  Couple of close ones.
08 07 46 38  CC  Roger.
08 07 47 50  CC  7, be advised the Mercury's doing a good
                 job down there. They're taking rolls up to
                 about 20 degrees and 40- to 50-knot winds, some
                 15-16-foot waves, and we're still getting
good data coming through.
08 07 48 06    CMP    Wow, sounds like they're having a high old time. Where are they exactly? Is there a big storm in their area; is that what's going on?

08 07 48 16    CC    Well, the typhoon is coming on them from the Phillipines, and they're up around Taiwan, somewhere in that area.

08 07 48 25    CMP    Oh, yes. Up at Taiwan, you say?

08 07 48 30    CC    Somewhere around in there.

08 07 48 32    CMP    Yes. That's kind of a bad place to be with that typhoon going on there.

08 07 48 38    CC    Yes, I think they're going to ride it out.

08 07 48 45    CMP    I don't think they have much choice.

08 07 48 48    CC    That's what they said. We got word that they're a little green, and it's not exactly green with envy.

08 07 49 05    CMP    Ron.

08 07 49 35    CMP    Hey, Ron.

08 07 49 37    CC    Roger.

08 07 49 38    CMP    We, at least Walt and I, started drinking out of our little plastic bags instead of the water gun because it's too hard to work anymore. Something's wrong with the trigger. I estimate I've had about 16 to 20 ounces of water in an hour or so using the plastic bag.

GUAM (REV 126)

08 07 51 14    CC    7, Houston through Guam now.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 07 51 43</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>08 07 51 46</td>
<td>CMP</td>
<td>Go.</td>
</tr>
<tr>
<td>08 07 51 48</td>
<td>CC</td>
<td>Roger. Did the drink gun stick completely now, or is it still just hard to operate?</td>
</tr>
<tr>
<td>08 07 51 53</td>
<td>CMP</td>
<td>It works; it's just real hard to operate.</td>
</tr>
<tr>
<td>08 07 51 57</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 07 52 49</td>
<td>CC</td>
<td>Apollo 7, Houston. LOS; Redstone at 14.</td>
</tr>
<tr>
<td>08 07 52 53</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 08 14 38</td>
<td>CC</td>
<td>Apollo 7, Houston through Redstone.</td>
</tr>
<tr>
<td>08 08 14 43</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 08 14 44</td>
<td>CC</td>
<td>Roger. Loud and clear. I have a one-line flight plan update.</td>
</tr>
<tr>
<td>08 08 14 53</td>
<td>CMP</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>08 08 14 55</td>
<td>CC</td>
<td>Roger. At 201 plus 20, delete &quot;Radar transponder self-test.&quot;</td>
</tr>
<tr>
<td>08 08 15 06</td>
<td>CMP</td>
<td>Roger. I got it.</td>
</tr>
<tr>
<td>08 08 15 08</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 08 17 45</td>
<td>CC</td>
<td>Say, Donn.</td>
</tr>
<tr>
<td>08 08 17 48</td>
<td>CMP</td>
<td>Go, Ron.</td>
</tr>
<tr>
<td>08 08 17 49</td>
<td>CC</td>
<td>Roger. At 201 plus 24, you'll be passing right over Typhoon Gloria.</td>
</tr>
<tr>
<td>08 08 17 59</td>
<td>CMP</td>
<td>Okay. I'll try to get a look at it, a picture if possible.</td>
</tr>
<tr>
<td>08 08 18 03</td>
<td>CC</td>
<td>Roger. That's right over the center.</td>
</tr>
<tr>
<td>08 08 18 07</td>
<td>CMP</td>
<td>Okay. Thank you.</td>
</tr>
</tbody>
</table>
08 08 19 18 CMP Ron, could you get me a map update, please?
08 08 19 23 CC Wilco.
08 08 19 49 CC 7, Houston. Are you ready to copy?
08 08 19 53 CMP Yes, go ahead.
08 08 19 54 CC Roger. REV 126 GET 199 plus 21 plus 32, longitude 31.4 east.
08 08 20 13 CMP Okay. Thank you.
08 08 20 14 CC Roger.
08 08 22 40 CC 7, Houston. Thirty seconds LOS; Ascension at 40.
08 08 22 45 CMP Roger.

ASCENSION (REV 127)
08 08 40 28 CC Apollo 7, Houston through Ascension. And I have some battery ampere-hours remaining.
08 08 40 50 CMP You know, this bird with all of its windows makes a hell of a planetarium.
08 08 40 59 CC You mean, it's kind of hard to see.
08 08 41 02 CMP No, it's very good to see.
08 08 41 04 CC Great.
08 08 41 06 CMP Boy, you can really spot them.
08 08 41 32 CMP Go ahead, Ron.
08 08 41 35 CC Roger. Batt A 26.9, B 26.5, C 39.5, Lima Sierra 073 slant NA.
08 08 41 59 CMP Roger. I understand.
08 08 46 02 CC Apollo 7, Houston. Opposite omni.
08 08 46 07 CMP Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 08 50 34</td>
<td>CC</td>
<td>Apollo 7, Houston. About LOS; pick you up at Mercury, 18.</td>
</tr>
<tr>
<td>08 08 50 40</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 09 18 40</td>
<td>CC</td>
<td>Apollo 7, Houston through Mercury.</td>
</tr>
<tr>
<td>08 09 18 45</td>
<td>CMP</td>
<td>Roger, Houston.</td>
</tr>
<tr>
<td>08 09 18 49</td>
<td>CC</td>
<td>Roger. Donn, I've got block data to send up there and work; try to work it in around checking for the typhoon now. So let me know when you want it.</td>
</tr>
<tr>
<td>08 09 18 59</td>
<td>CMP</td>
<td>Okay. Fine. Thanks, Ron.</td>
</tr>
<tr>
<td>08 09 20 30</td>
<td>CC</td>
<td>And - 7, Houston - we would like for you to do the CMC power up prior to Redstone, and then we'll update your W matrix over Redstone this pass.</td>
</tr>
<tr>
<td>08 09 20 41</td>
<td>CMP</td>
<td>This pass? Okay; will do.</td>
</tr>
<tr>
<td>08 09 21 50</td>
<td>CMP</td>
<td>I think I've got the storm here.</td>
</tr>
<tr>
<td>08 09 21 53</td>
<td>CC</td>
<td>Good.</td>
</tr>
<tr>
<td>08 09 22 46</td>
<td>CMP</td>
<td>I'll have to say it really covers a huge area.</td>
</tr>
<tr>
<td>08 09 22 56</td>
<td>CC</td>
<td>Can you kind of determine where the eye is?</td>
</tr>
<tr>
<td>08 09 23 02</td>
<td>CMP</td>
<td>Well, not exactly; hold it a second, hold the phone, I think I do have it. We're going right over the eye, Ron, and I'll give you a mark when we're directly over it.</td>
</tr>
<tr>
<td>08 09 23 36</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 09 23 50</td>
<td>CMP</td>
<td>MARK.</td>
</tr>
<tr>
<td>08 09 23 52</td>
<td>CC</td>
<td>Roger. 23 50.</td>
</tr>
</tbody>
</table>
Hey, Ron, are you there?
Affirmative. Go.
Okay. Frames 54 and 55 of magazine Ro were of typhoon Gloria, and 35 is a picture of the eye.
Roger.
At least that's what it looked like to me.
That's about right on time; that's where they forecasted.
... you could see the long straight through ... circulation in the thing and then there was almost a solid mass of white right into the eye, then there was this little peephole in the middle of it. You could see there were some scattered and broken clouds in it. You could see the water even through it.
Well, I'll be darned.
Very interesting.
Yes.
How's the Mercury group holding up out there?
I think they're still green.
I'll bet they are.
Apollo 7, Houston. Opposite omni.
Roger.
It's a good thing we don't log those transmissions.
What's that?
08 09 27 58  CC  Opposite Omni type.
08 09 28 01  CMP  Yes.
08 09 30 14  CC  Apollo 7, Houston. Thirty seconds LOS; Redstone at 49.
08 09 30 19  CMP  Could I get your block update then?
08 09 30 22  CC  Roger.

REDSTONE (REV 127)

08 09 50 41  CC  Apollo 7, Houston through Redstone.
08 09 51 10  CC  Apollo 7, Houston.
08 09 51 56  CC  Apollo 7, Houston. Trying again.
08 09 52 24  CC  Apollo 7, Houston. How do you read?
08 09 52 46  CC  Roger. Donn, you're not getting back to us.

The Redstone M and O is relaying. If you want me to read the block data up, then you can read it back over Ascension.

08 09 54 35  CC  Apollo 7, Houston transmitting in the blind.
I'll give you block data for area 129, the rest over Ascension. 129 dash Alfa Charlie plus 080 minus 0250 203 plus 23 plus 55 5190.

08 09 55 22  CT  Redstone LOS. Redstone reacquiring.
08 09 55 37  CT  Redstone LOS. Redstone reacquiring.
08 09 55 53  CT  Redstone LOS.
08 09 56 19  CC  Apollo 7, Houston in the blind. We will send your W matrix over Ascension. Keep the CMC powered up.

08 09 56 41  CT  Redstone LOS. Redstone AOS.
08 09 57 21 CC Apollo 7, Houston. Ascension at 16.

ASCENSION (REV 128)

08 10 16 03 CC Apollo 7, Houston through Ascension.

08 10 16 10 CMP Roger.

08 10 16 11 CC Roger. Loud and clear this time, Donn, and I have the block when you're ready.

08 10 16 41 CMP Okay, Ron. Go ahead.

08 10 16 48 CC Roger. Are you in ACCEPT? Then we will send the W matrix update.

08 10 16 54 CMP Okay. You have it.

08 10 16 59 CMP I got your 129 update.

08 10 17 01 CC Okay. I'll start with area 130 dash 2 Alfa plus 192 minus 0270 204 plus 58 plus 45 4399.

08 10 17 29 CC Apollo 7, Houston. Switch omni.

08 10 17 39 CMP Okay. Go ahead.

08 10 17 42 CC Roger. 131 dash 2 Charlie plus 271 minus 0271 206 plus 35 plus 31 3774, 132 dash 1 Charlie plus 237 minus 0620 208 plus 02 plus 22 4055, 133 dash 1 Alfa plus 294 minus 0600 209 plus 40 plus 53 3367, 134 dash 1 Alfa plus 299 minus 0600 211 plus 20 plus 43 2938. Over.

08 10 19 32 CMP Roger. 129 dash Alfa Charlie plus 080 minus 0250 03 23 55 5190, 130 dash 2 Alfa plus 192 minus 0270 204 58 45 4399, 131 dash 2 Charlie plus 271 minus 0271 206 35 31 3774, 132 dash 1 Charlie plus 237 minus 0620 208 02 22 4055,
133 dash 1 Alfa plus 29½ minus 0600 209 40 53
33 67, 134 dash 1 Alfa 299 minus 0600 211 20
43 2938.

08 10 20 34 CC Apollo 7, Houston. Your readback correct.
08 10 20 47 CC Apollo 7, Houston. Our link is complete; you
can power down.
08 10 20 54 CMP Okay. I'll put it back to bed.
08 10 20 56 CC Roger.
08 10 21 42 CC A couple more football scores here if you want.
08 10 21 46 CMP Oh, okay. Go ahead.
08 10 21 49 CC Roger. Air Force over Colorado State 31 to
nothing.
08 10 21 55 CMP Wow. They're coming up in the world.
08 10 21 59 CC Roger. Navy over Pittsburg 17 to 16.
08 10 22 03 CMP Navy over who?
08 10 22 05 CC Pittsburg.
08 10 22 06 CMP Oh, that's very good.
08 10 22 10 CC California over UCLA 39 to 15. Purdue eked out
one 28 to 27 over Wake Forest. Michigan 27,
Indiana 19. Minnesota beat Michigan State 14
to 13.
08 10 23 03 CC Notre Dame 58, Illinois 8. Still don't have
any Texas games yet.
08 10 23 20 CMP Ron, what did you say that California – UCLA
score was?
08 10 23 23 CC 39 California, 15 UCLA.
08 10 23 47  CMP  How about Ohio State? Do you have them there?
08 10 23 56  CC   Say again, Donn. Opposite omni.
08 10 24 02  CMP  Roger. Ohio State.
08 10 24 27  CMP  Roger.
08 10 25 10  CC   7, Houston. One minute LOS; Mercury at 54.
08 10 25 18  CMP  Okay.
08 10 25 19  CC   We show your waste quantity 84. You can dump your convenience or wait till the other guys get up.
08 10 25 27  CMP  Okay. I'll get on it in a little while.
09 10 26 24  CC   Ascension must have a good radar. They've beat our LOS times every time.
08 10 26 31  CMP  Yes, they do all right.
          MERCURY (REV 128)
08 10 57 04  CC   Apollo 7, Houston through Mercury. Or try a voice check. Pretty poor.
          GUAM (REV 128)
08 11 00 29  CC   Apollo 7, Houston through Guam.
08 11 01 10  CC   Apollo 7, Houston through Guam.
08 11 01 13  CMP  Roger, Houston.
08 11 01 14  CC   Roger. Loud and clear. Donn, I've got a flight update when you're ready to copy.
08 11 01 21  CMP  Okay. Go ahead.
08 11 01 23  CC   Roger. Normal flight plan through SPS burn number 6. GETI about 210 plus 08. At 207 plus 20,
fuel cell oxygen purge. At 211 plus 40, MCC update P22 horizon sightings. 212 plus 05 as scheduled. 213 plus 00 to 217 plus 30, delete all scheduled activity. 213 plus 00, add MCC update, state vector, NAR check, P22 landmark data. 213 plus 10, TV turn on; 213 plus 12 to 213 plus 23, TV pass. Still with me, Donn?

Still with you.

213 plus 40, P22 horizon sightings.

Ron, I don't understand that. What in the world is a P22 horizon sighting?

Roger. What we're trying to do is get a hack on the difference between the real horizon and what you think the horizon is. And we'll pass up some more data on that later.

Say, this is a new one on me; I don't know anything about this.

That's affirmative. We'll - I've got some information to pass up to you.

Okay.

Okay. At 214 plus 10, P52 DMU realign option 3. At 214 plus 45, start P22 landmark tracking pass. At 215 plus 30, MCC update P22 landmark data. At 216 plus 00, MCC state vector, if required. At 216 plus 15, start P22 landmark tracking pass. At 217 plus 15, power down.
08 11 26 13  CC  Apollo 7, Houston through Redstone. Standing by.
08 11 26 17  CMP  Roger, Houston.
08 11 26 18  CC  Roger. Loud and clear, Donn. Did you copy everything on that?
08 11 26 24  CMP  Wait just a second.
08 11 26 36  CMP  I'm going to check the waste water in about a minute or two.
08 11 26 41  CC  Roger.
08 11 26 42  CMP  What I got was a normal flight plan adding a fuel cell O2 purge at 27 20. Is that what you gave me? 27 20, is that right?
08 11 26 55  CC  Yes.
08 11 26 57  CMP  Coming up on burn at 210 08. I have at 211 40 P22 horizon sightings. Is that right?
08 11 27 12  CC  Yes. I'll update you. The information, at that time, - it is an MCC update at that time.
08 11 27 18  CMP  Okay. That's the information. Wait a second.
08 11 27 32  CMP  Got 213 on the hour. We got state vector, NAV check, and P22 landmark data, right?
08 11 27 41  CC  Affirmative.
08 11 27 42  CMP  Okay. Then we have a TV pass starting at 12 and running through 23, is that it?
08 11 27 50  CC  Roger. Through 23.
08 11 27 52  CMP  Okay. Turn the TV on in 10 minutes, anyway, at 23 10.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Message</th>
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</thead>
<tbody>
<tr>
<td>08 11 27 55</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 11 27 57</td>
<td>CMP</td>
<td>We got P22 horizon check, whatever that is, at 213 401</td>
</tr>
<tr>
<td>08 11 28 03</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 11 28 12</td>
<td>CMP</td>
<td>A P22 opposite 21¼ 10 start of P22 landmark tracking at about 21¼ 25, I guess that is; anyway, the date matches. And get more P22 data at 215 30.</td>
</tr>
<tr>
<td>08 11 28 34</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 11 28 37</td>
<td>CMP</td>
<td>An updated state vector of 216 - P22 again at 216 150.</td>
</tr>
<tr>
<td>08 11 28 46</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 11 28 48</td>
<td>CMP</td>
<td>And power down at 217 15.</td>
</tr>
<tr>
<td>08 11 28 51</td>
<td>CC</td>
<td>Roger. And if you notice, this goes into your sleep period, so we recommend that you change your sleep periods and move it back 2 hours - everybody back 2 hours.</td>
</tr>
<tr>
<td>08 11 29 07</td>
<td>CMP</td>
<td>Stand by one; I've got to shut the water off.</td>
</tr>
<tr>
<td>08 11 29 10</td>
<td>CC</td>
<td>Roger. We show 24 percent now.</td>
</tr>
<tr>
<td>08 11 29 18</td>
<td>CMP</td>
<td>You show 24?</td>
</tr>
<tr>
<td>08 11 29 20</td>
<td>CC</td>
<td>Oops, we just lost date again.</td>
</tr>
<tr>
<td>08 11 29 24</td>
<td>CMP</td>
<td>Okay. I'm reading about 15 in here now; I'm going to shut it off.</td>
</tr>
<tr>
<td>08 11 29 32</td>
<td>CC</td>
<td>Roger. We concur.</td>
</tr>
</tbody>
</table>
| 08 11 29 56 | CMP | Still got that big water bubble around the fitting.
Great.

It's really funny looking; it's a big - almost a sphere about as big around as a silver dollar, hanging on the wall by the fitting for the water dump.

Well, I'll be darned. Is the leak between hose and the fitting or between the fitting, and the panel?

Donn, does it leak between the hose and the fitting and - or between the fitting and the panel?

It's between the fitting and the panel - the water service panel.

Roger.

It leaks - are or that P-nut, that you tighten down on to get the fitting on.

Roger.

It doesn't hurt anything; it's just a big blob and stays there until you wipe it up.

7, Houston.

Right.

Roger. On this passive thermal control test tomorrow, we want to use the same procedures that you have on board except we want to pitch instead of roll.

Okay. This is the one on 212, is that it?
08 11 32 14  CC  Say again.
08 11 32 17  CMP  This is the one the strength of 212 hours?
08 11 32 22  CC  That's affirmative.
08 11 32 25  CMP  Okay.
08 11 32 29  CC  Your procedure is written up to roll, but we
          want the pitch about the Y-axis.
08 11 32 35  CMP  Okay. Same deal; we just substitute a pitch
          for a roll, is that right?
08 11 32 38  CC  That's affirmative.
08 11 32 40  CMP  You want the same rate, 310?
08 11 32 43  CC  Affirmative.
08 11 32 45  CMP  Okay.
08 11 34 31  CC  Apollo 7, Houston. One minute LOS. I have some
          good news for you at Canaries at 57.
08 11 34 39  CMP  What did you say again?
08 11 34 41  CC  Roger. Canary at 57.
          CANARY (REV 128)
08 11 57 53  CC  Apollo 7, Houston through Canaries.
08 11 58 51  CC  Apollo 7, Houston.
08 11 58 56  CMP  Roger. Houston, Apollo 7.
08 11 58 57  CC  Roger. Loud and clear. Donn, when Wally
          and Walt wake up, have them remove their BIOMED
          harnesses and stow carefully for postflight
          malfunction analysis. Over.
08 11 59 26  CMP  Good.
08 12 04 04  CC  7, Houston. One minute LOS; Redstone at 01.
08 12 04 10  CMP  Roger. I understand.
Apollo 7, Houston through Redstone.

Houston, Apollo 7.

Roger. Loud and clear.

Roger.

Apollo 7, Houston. I have the procedures for your P22 horizon sighting if you'd like to copy.

Roger. Stand by.

Roger. Select P22, use unknown landmark option. Do steps 1 to 6. Go to optics mode MANUAL and proceed to step 9. Disregard R-1, R-2, and R-3. Make five marks at least 10 seconds apart and then exit the program at step 12. We will give you the gimbal angles for starting with zero optics, if you so desire.

Apollo 7, Houston. Opposite omni.

All right.

Let's see, I just select P22, use unknown landmark, go through the program to step 6 and then optics MANUAL, proceed to step 9, ignore the display, make five marks 10 seconds apart, then exit at step 12.

That's affirmative.

Okay. I don't think we need gimbal angles for zero optics. What do you want to use - just
the sextant, or the telescope? I guess the sextant they'd prefer, huh?

08 13 06 55  CC  They'd prefer the sextant, and use the upper horizon, or what you think is the upper horizon, anyhow.

08 13 07 03  CDR  Yes, whatever that is.
08 13 07 05  CC  Roger.
08 13 07 07  CMP  Okay. We'll try it. These done in daylight, are they?
08 13 07 15  CC  That's affirmative. In the daylight.
08 13 07 19  CMP  Okay. I don't think we'll need any gimbal angles. Just set up for small in forward ORB rate.

08 13 07 26  CC  Okay. And if it's going good and you can get it at different shaft and trunnion angles, the more data we get the better off we'll be, but don't waste any more fuel on it.
08 13 07 39  CMP  Okay. What's the purpose of this anyway? I guess I don't understand what and why we're doing it.
08 13 07 44  CC  Okay. The purpose is for - to get an idea on the difference between the apparent horizon and the real earth horizon for the calculations on some midcourse corrections.
08 13 07 59  CMP  Yes. I understand that, but I don't understand what use it is because midcourse navigation is
done several thousand miles out from the earth and at that point, this horizon jazz doesn't mean anything. Hell, it's all I'm going to be --

I see what your saying but we don't --

... that's the only place this program applies anyway.

Roger. We see what you're saying but we still don't have a hack on what this difference is; we don't have any hack on what the difference is, so we'd like to get at least one data point on that.

Yes, okay. We can go ahead and do it.

7, Houston.

Go.

Roger. Antigua acquisition at 21, and we'd like to have you be in POO at that time, to send a load to you.

Okay. I'm going to power up before that and try to do P51.

Roger.

Apollo 7, Houston. One minute LOS.

Roger.

ANTIGUA (REV 130)

Apollo 7, Houston through Antigua.

Apollo 7, Houston through Antigua.

Roger. Houston, Apollo 7.
Roger. We monitor POO. If you go to ACCEPT, we have a couple of loads for you.

Okay.

And I have the maneuver PAD when you're ready to copy.

Okay. Stand by.

Go ahead with your up PAD data.

Roger. SPS number 6, minimum impulse 210 08 0000 minus 00000 plus 00154 minus 00000 2362 plus 0902 00055 24814 minus 073 minus 128 000 34 0422 124 209 20 0000 minus 2214 plus 10262 1511. Last block: roll, pitch and yaw, all balls.

And we have about 1 minute to LOG. I'll wait for Canary for the readback.

Okay. What are you going to do about this up-link? Is it all through, or are you still doing it?

Do we have a VERB 33 in the DCKY, Donn?

Okay. After we ... we can go on?

Yes. Punch and ENTER and go on.

Las Vegas.

And, Donn, LOS is coming up. We'll get the readback at Canary.

Okay, Bill. Thank you.

Thank you.
08 13 32 06  CC  Apollo 7, Houston through Canary.
08 13 32 31  CC  Apollo 7, Houston through Canary.
08 13 32 39  CMP  Roger. This is Apollo 7.
08 13 32 41  CC  Roger. I have one comment for the maneuver
PAD before readback, and that is that maneuver
is heads up, out of plane, south.
08 13 32 52  CMP  Roger.
08 13 32 53  CC  And standing by for readback.
08 13 32 55  CMP  Stand by one.
08 13 34 36  CMP  Houston, Apollo 7.
08 13 34 38  CC  Roger. Go, Donn.
08 13 34 43  CMP  Roger. I'm ready to read this back now.
08 13 34 45  CC  Okay.
08 13 34 47  CMP  Okay. SPS 6: MIN impulse 21008 0000 minus all
balls plus 00154 minus all balls 6362 0902
3 balls 55 28114 minus 073 minus 129 000 34
0422 121. I guess that's 12.4 degrees trun-
con angle.
08 13 35 18  CC  Affirmative.
08 13 35 20  CMP  209 00 0000 minus 2214 plus 102 62 151 and all
zeros for attitude. This will be heads up out
of plane. Say what's the rest of your comments?
08 13 35 40  CC  Heads up, out of plane, south and I'm sure you
have it right but the altitude in ROUN 43 is
151.1.
08 13 35 50  CMP  Oh, Roger. I thought I read that.
08 13 35 56  CC  Readback is correct.
08 13 35 59  CMP  Okeydoke.
08 13 36 19  CC  Apollo 7, Houston. Opposite omni, please.
08 13 36 24  CMP  Roger.
08 13 39 54  CC  Apollo 7, Houston. Coming up 1 minute LOS Canary. We'll have another minute and one-half with Madrid if you want to turn your S-band volume up at 40 plus 30. Also would like for you to go to BLOCK on your uplink.
08 13 40 08  CMP  Roger. BLOCK. Thank you.
08 13 40 10  CC  Thank you.

MADRID (REV 130)

08 13 41 24  CC  Apollo 7, Houston. One minute LOS Madrid; Honeysuckle at 17.
08 13 41 35  CMP  Roger, Houston.
08 13 41 46  CC  Apollo 7, Houston. We will need S-band volume up for Honeysuckle.
08 13 41 50  CMP  Roger. I'll get it up for Honeysuckle, too.

HONEYSUCKLE (REV 130)

08 14 19 04  CC  Apollo 7, Houston through Honeysuckle.
08 14 19 43  CC  Apollo 7, Houston through Honeysuckle.
08 14 19 48  CMP  Roger. Houston, Apollo 7.
08 14 19 50  CC  Roger.
08 14 20 04  CC  Houston, Apollo 7.
08 14 20 05  CC  Go.
08 14 20 08  CMP  Say again.
08 14 20 10  CC  Apollo 7, Houston.
08 14 20 11  CMP  Roger.
08 14 20 15  CC  Oh, I'm sorry, Donn. I thought you were calling me.
08 14 20 18  CMP  Yes, I was; I was just answering.
08 14 22 41  CC  Apollo 7, Houston. One minute 30 seconds LOS Honeysuckle. One thing I didn't pass up on the maneuver PAD that they wanted mentioned was that it will be quad B and D ullage for burn 6.
08 14 22 57  CMP  Yes. Roger. That's what I figured on using, Bill.
08 14 22 58  CC  That's what I told them.
08 14 23 00  CMP  Okay. Thank you.
08 14 24 09  CC  Apollo 7, Houston. Coming up on LOS; Redstone at 36.
08 14 25 15  CMP  Roger. Bill, see you at 36.
08 14 24 18  CC  Roger.
REDSTONE (REV 130)
08 14 36 56  CC  Apollo 7, Houston through Redstone.
08 14 37 02  CMP  Roger. Houston, Apollo 7.
08 14 37 06  CC  Roger. Ron has been working on this P22 procedure, and he has a few more notes he'd like to give you.
08 14 37 13  CMP  Oh, okay. Just a second; I'll get my pen out.
08 14 37 23  CMP  Go ahead.
Okay. Donn, before you select P22 on the thing, preset your shaft to approximately zero degrees and the trunnion to approximately 10 degrees.

What for?

Roger. What we want to do is use the landmark line of sight in the sextant there, so when you're making the mark -

Wait a minute. Wait a minute now, Ron. You mean you want me to use the landmark line of sight, and you want me to fly the spacecraft and look at the horizon?

That's affirmative.

I don't think that makes much sense, frankly. For one thing, we're going to be pitched way up if we do that, which means that we're going to be fighting this perigee torque, very likely. The other thing is it takes fuel to do that. You've got to keep maneuvering around to get it on there. You maneuver line of sight around with the spacecraft rather than maneuvering the optics with the optics controls. Can't they get the same - P22 measures optics angles as well as DMU gimbal angles. That's what it's for. I don't see why we can't use the - if we're going to use P22, why don't we use the sextant line of sight rather than the landmark line of sight.
If we use the ... line of sight, we can hold local horizontal attitude; with it pitched up 15 degrees or so, it will work out fine, but if you go pitch up 50 degrees to put that line of sight on it, that's going to be a horse of a different color.

Okay. I understand your concern, Donn, but what we want to do is get a back when looking through this landmark line of sight at the horizon. It looks different than it does through the star line of sight on the sextant.

Oh, I see. Okay, all right. We'll give it a whirl.

That takes a little more than "gee whiz" data anyway because that horizon doesn't look anything like that when you're 10 000 miles away.

Apollo 7, Houston.

Roger. To add a little food to what I said before on why we want it in this mission at a close distance: if we can get a better feel for what this DELTA-H of the horizon is, we get a better feel closer than we would at say 10 000 miles out.

Roger. I can tell you what it is. It's 2.8 degrees; we measured it.
Okay.

No, we did. We measured it in the COAS; we measured it in the telescope. Wally's measured it in Mercury and Gemini flights, and it's well 2.8 plus or minus a couple ... depending on where the sun is and the lighting conditions and maybe even what you're looking at it with, I don't know.

Roger. I think the only difference we might have in there is that we're looking at it through the diachromatic filter on that landmark line of sight now.

Yes, that could change it a little; I don't know, make it look orange.

Roger.

7, Houston. What you last said there is the object of the whole thing, really. We just want to get an idea of what it looks like - what you think the top of the horizon is through that orange-looking filter.

Well, we did that the other day, you know. That's why I gave up on making those starmarks. There just wasn't anything there that you could say was a firm line to make a mark on. It was all fuzzy and amorphous and like that.

We see what you're saying, really.
08 14 43 40  CC  Donn, new subject. My errand was completed this afternoon.

08 14 43 47  CMP  Roger. Thank you.

08 14 43 49  CC  Roger.

08 14 43 52  CMP  What sort of response did you get?

08 14 43 56  CC  The right kind, the good kind.

08 14 44 00  CMP  Very good.

08 14 44 04  CC  And we'll see you tomorrow evening.

08 14 44 07  CC  Okay, Ron. Good night.

08 14 44 10  CC  Roger.

08 14 44 19  CC  Apollo 7, Houston. Opposite omni.

08 14 44 22  CMP  Roger.

08 14 44 32  CC  Apollo 7, Houston. Switch omni again, please.

08 14 45 37  CMP  Roger.

08 14 46 23  CC  Apollo 7, Houston. One minute LOS Redstone; Antigua at 55.

08 14 47 02  CC  Apollo 7, Houston. Coming up on LOS Redstone; Antigua at 55.

08 14 47 10  CMP  Roger.

ANTIGUA through BERMUDA (REV 131)

08 14 56 46  CC  Apollo 7, Houston through Antigua.

08 15 04 16  CC  Apollo 7, Houston. Coming up on Antigua LOS in about 1 minute; at Canaries at 07.

08 15 04 27  CMP  Roger, Bill.

08 15 04 39  CC  Donn, I have one question. Do you have the number 1 set of BMAC's powered?
08 15 04 45 CMP Negative. I do not.
08 15 04 46 CC Thank you.
08 15 04 50 CMP Bill, I've got about half the SCS system powered up here.
08 15 04 54 CC Thank you.

CANARIES (REV 131)
08 15 07 57 CC Apollo 7, Houston through Canaries.
08 15 08 02 LMP Roger, Bill. Good morning.
08 15 08 03 CC Good morning. How are you today? Just wanted to re-confirm that you understand that the IMP and the CDR may remove BIOMED harnesses.
08 15 08 17 LMP Roger. We've got that word.
08 15 08 20 CC Okay. Thank you.
08 15 08 22 LMP Do you mean we can remove them right now?
06 15 08 23 CC Affirmative.
08 15 08 25 LMP I see; okay.
08 15 08 34 CDR Aren't you all very clever?
08 15 08 37 CC Thought you'd like that.
08 15 08 39 CDR I do. It doesn't bother us much one way or the other, but the real point is that I think somebody has probably caught on to the fact that they're not very good equipment.
08 15 15 34 CC Apollo 7, Houston. About 1 minute from LOS Canary. S-band volume up at 16 for approximately 2 more minutes of S-band.
08 15 15 48 IMP Roger, Bill.
08 15 15 50  CC  And we'd like to confirm that you have a - have an update for fuel cell O₂ purge at 207 plus 20.
08 15 16 00  CMP  Roger. We've got that there on the flight plan.
08 15 16 03  CC  Thank you.

MADRID (REV 131)
08 15 16 58  CC  Apollo 7, Houston. One minute LOS Madrid; Carnarvon at 43.

CARNARVON (REV 131)
08 15 44 10  CC  Apollo 7, Houston through Carnarvon. Standing by.
08 15 45 51  CC  Apollo 7, Houston. Opposite omni, please.
08 15 45 58  CMP  Roger, Bill.
08 15 46 01  CC  Thank you.
08 15 48 33  LMP  Houston, Apollo 7. Can we get a chart update, please?
08 15 48 36  CC  Roger. Stand by.
08 15 48 44  CC  Apollo 7, Houston. Chart update, REV 132 209 plus 53 plus 55 130.3 west.
08 15 49 11  LMP  Roger.
08 15 50 19  CC  Apollo 7, Houston. One minute LOS Carnarvon. S-band up for Honeysuckle at 52.
08 15 50 30  CDR  Roger.

HONEYSUCKLE (REV 131)
08 15 57 13  CC  Apollo 7, Houston. We still have about 3 minutes to go. Sounds like we're coming into a keyhole. Redstone at 13.
08 15 57 22 LMF Roger, Bill.
08 15 57 45 CC Apollo 7, Houston. Opposite omni, please.

REDSTONE (REV 131)
08 16 13 41 CC Apollo 7, Houston through Redstone.
08 16 13 59 LMF ... , Bill?
08 16 14 00 CC Go.
08 16 14 04 CC Apollo 7, Houston. Go.
08 16 14 17 CC Apollo 7, Houston. I read you. Go.
08 16 14 22 LMF Roger.
08 16 16 07 LMF Houston, Apollo 7.
08 16 16 09 CC Apollo 7, Houston. Go.
08 16 16 11 LMF Roger. You're getting the readouts off our

DSDKY down there, aren't you?
08 16 16 14 CC Affirmative.
08 16 16 16 LMF Okay. Thank you.
08 16 16 19 CDR I blew it, Bill. I had 3½ balls, and I thought
I got 3½ balls 1 here.
08 16 16 26 CC I've been watching that. They've been looking
good.
08 16 20 06 CC Apollo 7, Houston. One minute LOS Redstone;
Texas at 28.

TEXAS through BERMUDA (REV 132)
08 16 27 39 CC Apollo 7, Houston through Texas.
08 16 27 44 LMF Good morning, Texas.
08 16 27 47 CC Good morning. And I have an update for the
second passive thermal control test.
08 16 27 55 IMP Wait one.
08 16 29 33 IMP Roger. Go ahead, Bill. What do you have on the passive thermal control?
08 16 29 36 CC Right. I have the update for times and attitude.
08 16 29 41 IMP Go ahead.
08 16 29 42 CC Right. T 0212 plus 05, T align 212 plus 31, attitude is roll zero, pitch zero, yaw zero. I also have some changes to the procedure.
08 16 30 07 IMP Roger. Did you give me the T zero first?
08 16 30 09 CC T zero 212 plus zero 5.
08 16 30 18 IMP Zero 212 plus zero 5, 212 plus 31, roll zero, pitch zero, yaw zero. Change your procedure?
08 16 30 25 CC Right. At T plus 5, make it read set up pitch rate, et cetera.
08 16 30 38 IMP Pitch rate of 0.3.
08 16 30 39 CC Right. And then just below LER, where it says P and Y attitude hold, make that read R and Y attitude hold.
08 16 30 58 IMP Roll and yaw attitude hold, pitch attitude reads 0.3 degrees per second. Go on.
08 16 31 02 CC Right. At T plus 26, confirm right - that's correct, pitch rate 0.3 degrees per second, et cetera. And make it disable R and Y, roll and yaw.
08 16 31 22 IMP Okay.
08 16 31 23 CC And the second line from the bottom there, from Y-axis orientation, et cetera.
08 16 31 40  CC  And just as a reminder, don't key in the T align time until within 90 minutes of start test.

08 16 33 29  CC  Apollo 7, this is Houston. You're GO for 150 dash 1.

08 16 33 35  IMP  Roger. Thank you. That's the next to last one, isn't it?

08 16 33 39  CC  Just about. And I passed up - I said don't key in T align time till within 90 minutes of start test. That was wrong. It should have been don't key in T align time till within 90 minutes of T align time.

08 16 33 54  IMP  Roger. That's the way I took it.

08 16 33 55  CC  Okay.

08 16 40 15  CC  Apollo 7, Houston. One minute LOS Bermuda. Canaries at 44.

08 16 40 22  CDR  Roger, Bill.

CANARY (REV 132)

08 16 44 04  CC  Apollo 7, Houston through Canary. Standing by.

08 16 44 08  CDR  Roger. Bill, would you work up the man hours that were flown on Gemini 7?

08 16 44 17  CC  Stand by.

08 16 44 19  CDR  We passed Gemini V on time; we're waiting to pass Gemini VII on man hours.

08 16 44 26  CC  Oh, I see what - okay.

08 16 47 16  CC  Apollo 7, Houston.

08 16 47 20  CDR  Go ahead, Bill.
Right. Gemini VII: 661.2 hours. You are coming up on 627 in about 13 minutes.

Roger.

Also, we would like the SPS line heaters to A; we have an engine valve temp around 50 degrees; we'd like to warm that up a little bit. And you can turn that back off whenever the inlet temperature reaches 75 degrees, or in any event turn it OFF before the burn.

Okay. I have an SPS propellant tank temperature here which is not a very apt description, maybe, of the main one. Should I turn it off when my measurement shows 75?

That is affirmative. But stand by for a check on that.

Okay. I'm turning the heaters ON now.

Right.

Apollo 7, Houston. That is affirmative. When the propellant tank temperature reaches 75 degrees.

Apollo 7, Houston. One minute LOS Canary; Carnarvon at 18.

Roger. We got a real thrill, we saw a contrail - oh, about 100 miles long right over the Canary Islands. We didn't get a chance to get a picture, though.
Roger. Contrail.
Roger. It was really a long one.
We just don't have that kind of film anymore.
Right. Too bad.

CARNARVON (REV 132)
Apollo 7, Houston through Carnarvon.
Roger.
Apollo 7, Houston. I'll give you a time hack on 209 plus 19 coming up in 5 seconds.
MARK.
209 plus 19.
...
Roger. I'll give you a MARK on 209 plus 20.
Roger. ... okay.
We'll try to work those into the Mercury block, Bill.
I'm having difficulty copying. I'll --
Ten, five, four, three, two, one.
MARK.
20 --
Watch my DSKY, babe.
Right. Thank you.
I was ... when you hit it. That's pretty tight, isn't it? My remark was you should have played with those Mercury range clocks if you want the fun.
08 17 20 20  CC  Right.
08 17 22 58  CDR  Hello, down there, Carnarvon. You look good today.
08 17 26 50  C?  Apollo 7, Houston. One minute LOS Carnarvon. S-band volume up in 1 minute for Honeysuckle.
08 17 26 57  CDR  Okay.
08 17 35 22  CC  Apollo 7, Houston. One minute LOS Honeysuckle; Guaymas at 58.
08 17 35 30  CDR  Roger.

08 17 58 33  CC  Apollo 7, Houston through Guaymas.
08 17 58 58  CDR  Loud and clear.
08 17 59 02  CC  Roger. Apollo 7, Houston. You can confirm SPS line heaters OFF.
08 17 59 10  LMP  They're coming OFF at the 5 minute and 30 second checklist.
08 17 59 13  CC  Roger. Thank you.
08 17 59 16  LMP  Have you noticed anything to be accomplished out of line heaters on board? I'm reading exactly the same temperature on mine - my heaters.
08 17 59 26  CC  Yes, we did show an increase at Carnarvon on your valve TEMP.
08 17 59 32  LMP  Okay. I'd like to leave a request. We may not be able to get it on your watch. I'd like to
find out how much water we burned yesterday on
the secondary coolant loop test.

Okay. We're checking on it.

Apollo 7, Houston. Are you trying to call?

Negative.

Fine.

Apollo 7, Houston. Confirm omni A.

That's affirmative.

Thank you.

Looks like another one might be better.

All SCS circuit breakers CLOSED.

Gimbal motor control, four CLOSED.

Direct RCS OFF.

Direct RCS OFF.

One roll channel ENABLED.

One roll channel B and D ENABLED.

EMAGS to RATE 2.

EMAGS to RATE 2.

Spacecraft control, CMC AUTO.

CMC AUTO.

SCS TV pulse RATE COMMAND.

RATE COMMAND.

TVC gimbal drive, pitch and yaw, AUTO.

AUTO.

TVC SERVO power, one and two ON.

One and two ON.
08 18 03 06 LMP Handcontroller power to ONE.
08 18 03 09 CMP Handcontroller power to ONE.
08 18 03 10 LMP Handcontroller two ARMED, stand by for main bus tie.
08 18 03 14 CMP Check.
08 18 03 22 LMP Bus ties ON. Gimbal motor pitch one, yaw one.
08 18 03 25 LMP Pitch one, START.
08 18 03 27 CMP ON.
08 18 03 29 LMP Gimbal one, START.
08 18 03 31 CMP ON.
08 18 03 33 LMP Translation handcontroller clockwise.
08 18 03 36 CMP Clockwise.
08 18 03 37 LMP Verify no MTVC.
08 18 03 41 CMP No MTVC.
08 18 03 42 LMP Pitch two, yaw two.
08 18 03 43 CMP Pitch two, START.
08 18 03 46 LMP ON.
08 18 03 47 CMP Yaw two, START.
08 18 03 48 LMP ON.
08 18 03 50 LMP Confirm and set GTI trim.
08 18 04 09 CMP GTI set.

GUAYMAS through BERMUDA (REV 133)
08 18 04 14 LMP Verify MTVC.
08 18 04 16 CMP Roger. MTVC verified.
08 18 04 18 LMP Translation handcontroller NEUTRAL.
08 18 04 21 CMP NEUTRAL.
08 18 04 22 LMP  Handcontroller power to BOTH.
08 18 04 25 CMP  BOTH.
08 18 04 26 LMC  Do your trim maneuver.
08 18 04 27 CMP  Roger.
08 18 04 34 LMC  Direct RCS ON.
08 18 04 46 LMC  Direct RCS ON.
08 18 04 50 CMP  Roger. Direct RCS is ON.
08 18 04 52 LMC  Manual attitude RATE COMMAND.
08 18 04 53 CMP  RATE COMMAND.
08 18 04 54 LMC  EMAG ATT-1/RATE 2.
08 18 04 57 CMP  ATT-1/RATE 2.
08 18 04 59 LMC  Standing by for 2 minutes.
08 18 05 00 CMP  Roger.
08 18 05 02 CDR  Trim maneuvers, GO.
08 18 05 18 LMC  Do I need another GDC align?
08 18 05 28 LMC  If we do, now is the time to do it.
08 18 06 00 CC  Two minutes.
08 18 06 01 CDR  Two minutes.
08 18 06 02 LMC  FDAL scale five-five.
08 18 06 07 CMP  Five and five.
08 18 06 08 LMC  DELTA-V thrust A and B NORMAL.
08 18 06 11 CMP  A and B NORMAL.
08 18 06 12 LMC  Handcontrollers ARMED.
08 18 06 14 LMC  Handcontrollers ARMED.
08 18 06 16 LMC  Standing by for 30 seconds.
08 18 06 18 CMP  Roger.
08 18 07 29  LMP  Okay. EMS to DELTA-V in AUTO.
08 18 07 31  CDR  DELTA-V AUTO 30 seconds.
08 18 07 33  LMP  Two-jet ullage in 20 seconds.
08 18 07 34  CMP  Roger.
08 18 07 41  CMP  Twenty seconds.
08 18 07 43  LMP  Jet ullage now.
08 18 07 50  CC  Ten, five, four, three, two, one.
08 18 08 00  CC  Ignition.
08 18 08 21  LMP  Roger. Burn complete DELTA-V thrust A and B OFF. Spacecraft control SCS.
08 18 08 36  CDR  Do you read the residuals, ground?
08 18 08 40  CC  Roger. I have them.
08 18 08 42  CDR  Roger.
08 18 08 45  LMP  Circuit breakers gimbal motor control, four OPEN.
08 18 09 05  CDR  Gimbal motor control circuit breakers OPEN.
08 18 09 09  CMP  TV servo power one and two OFF.
08 18 09 11  LMP  Direct RCS OFF.
08 18 09 13  CMP  Direct RCS OFF.
08 18 09 14  LMP  Main bus ties are already OFF.
08 18 09 16  CMP  EMS mode - OFF. Stand by reading residuals.
08 18 09 21  LMP  Roger. I got minus 12.8 on the DELTA-V counter. No chance to make it now.
08 18 09 31  CC  Donn, what'd you have to start with? What did you have set in?
08 18 09 34  CMP  5.5.
08 18 09 36  CC  Thank you.
08 18 09 40  CDR  That's almost a space first. We did it without hearing you, cats.
08 18 09 45  CMP  Can we go back to bed now?
08 18 09 47  CMP  (Snoring)
08 18 09 48  CDR  Hope you all weren't scared down there.
08 18 09 51  CC  We were watching.
08 18 09 54  CDR  Don't you feel like you're kinda left out?
08 18 10 00  CC  We saw it all.
08 18 10 02  CDR  Okay.
08 18 10 49  CC  Apollo 7, Houston.
08 18 10 52  IMP  Go ahead, Bill. Roger.
08 18 10 53  CC  I have a block data PAD here, back to the mundane things, when you're ready to copy.
08 18 11 21  IMP  Ready to copy.
08 18 11 22  CC  Roger. Block data: 135 dash 1 Alfa plus 266 minus 0630 213 00 32 2817, 136 dash 4 Alfa plus 279 minus 1618 215 38 45 3689, 137 dash 4 Bravo plus 302 minus 1620 217 17 27 3168, 138 dash 4 Alfa plus 280 minus 1617 218 57 54 2840, 139 dash 4 Bravo plus 217 minus 1640 220 39 03 2969, 140 dash Alfa Charlie minus 250 minus 0050 221.
08 18 13 44  IMP  Readback follows: 135 dash 1 Alfa plus 266 minus 0630 213 plus 00 plus 32 2817, 136 dash 4 Alfa plus 279 minus 1618 215 plus 38 plus 45 3689, 137 dash 4 Baker plus 302 minus 1620
217 plus 17 plus 27 3168, 138 dash 4 Alfa plus 280 minus 161.7 218 plus 57 plus 54 2840, 139 dash 4 Baker plus 217 minus 1640 220 plus 39 plus 03 2969, 140 dash Alfa Charlie minus 250 minus 0050 221 plus 19 plus 06 7392. Over.

Readback is correct.

Apollo 7, Houston. One minute to LOS Bermuda; Canary at 19.

CANARY (REV 133)

Apollo 7, Houston through Canary.

Roger, Bill.

What happened to your COMM down there this morning?

Say again?

What happened to your COMM? We missed your 2-minute and 1-minute check.

Well, I gave you a 2 minute and I waited - I didn't say anything at 1 minute. We said we were going to stay a bit more quiet on this burn for you.

Okay. I don't think we read your 2 minute. Of course, we may have overridden you because you were broadcasting. There was some background noise activity just about that time that was very strong.
08 18 20 39  CC  Yes, it must have been us. I've also been having some trouble keying.
08 18 20 45  CDR  Yes, it sounded like somebody was keying. It was open on the key. That's why I'm trying to bring the point up for you. That will give the COM TECH something to do.
08 18 20 54  CC  Roger.
08 18 21 05  CDR  Bill, do you have apogee and perigee for us after that, yet?
08 18 21 08  CC  Stand by.
08 18 21 16  CC  We're reading some tracking right now. We'll give you the results shortly.
08 18 21 21  CDR  Okay.
08 18 21 48  CDR  Bill, this is Wally.
08 18 21 50  CC  Go.
08 18 21 52  CDR  Roger. Someone is keying in on us.
08 18 21 57  CC  Say someone is keying in on you?
08 18 21 59  CDR  That's right. Very slowly. I'd like to give you a statement for the day.
08 18 22 04  CC  Right.
08 18 22 05  CDR  We do not require a static fire on the SPS engine for 101.
08 18 22 11  CC  Right. Copied.
08 18 22 12  CDR  At this time.
08 18 22 14  CC  Roger.
08 18 22 28  CDR  I might add that I'm also glad to be in the position of having the ability to avoid saying I told you so on this one.

08 18 22 36  CC  Amen to that. And have your orbit now. 90.3 by 236.2.

08 18 22 49  CDR  Roger.

08 18 22 56  CDR  263.2, huh? Was that 236.2, Bill?

08 18 23 01  CC  Affirmative. 236.2.

08 18 23 09  CDR  Okay. Our first cut onboard, just to compare the two was 234.7 and 88.2.

08 18 23 20  CC  Roger. 234.7 and 88.2.

08 18 23 24  CDR  Right. Guess we'll have to compare the two as best we can.

08 18 23 28  CC  Roger.

08 18 24 40  CDR  Houston, Apollo 7.

08 18 24 41  CC  Apollo 7, Houston. Go.

08 18 24 44  CDR  Roger. We had the TV camera OFF that time, not running, and it came out of the bracket.

08 18 24 50  CC  Roger. Understand.

08 18 24 52  CDR  In my lap. Didn't hurt anything, just got caught on my leg.

08 18 24 57  CC  And you did have it in the bracket?

08 18 24 59  CDR  That's right, the tunnel hatch bracket.

08 18 25 03  CC  Right.

08 18 25 07  CDR  The other thing that I don't think we've ever made note of is that all of our burns have been
conducted with the couch in the dock position - no problem.

08 18 25 19  CC  Understand.
08 18 25 23  CDR  We'll make the retroburn with the couch in the boost position.
08 18 25 27  CC  Roger.
08 18 25 46  CC  Apollo 7, Houston. One minute LOS Canary; Tananarive at 40.
08 18 25 53  CDR  Roger.

TANANARIVE (REV 133)
08 18 41 24  CC  Apollo 7, Houston through Tananarive.
08 18 44 37  CC  Apollo 7, Houston. One minute LOS Tananarive; Carnarvon at 54.

CARNARVON (REV 133)
08 18 54 12  CC  Apollo 7, Houston through Carnarvon.
08 18 54 15  IMP  Roger. Loud and clear.
08 18 54 28  CC  And, Walt, I have the water consumption during the secondary loop test yesterday as being approximately 5 to 8 pounds. Some uncertainty because there was an eat period at that time.
08 18 54 43  IMP  Because there was a what period?
08 18 54 46  CC  An eat period.
08 18 54 48  IMP  An eat period. Okay.
08 18 54 54  IMP  You can tell them that they can count on whatever reconstitutables were in that meal; we used the water that went with them.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 18 55 02</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 18 55 21</td>
<td>IMP</td>
<td>Hey, Bill, log me eight clicks from the water gun.</td>
</tr>
<tr>
<td>08 18 55 25</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 18 55 26</td>
<td>IMP</td>
<td>Might make a note that I think yesterday I reported that the water pistol trigger action is becoming very, very stiff and we're taking some of our drinking water and putting it in an empty bag out of the spout down there and the cold water spout seems to be getting a little stiff, too. The hot water spout still works nice and smooth.</td>
</tr>
<tr>
<td>08 18 55 46</td>
<td>CC</td>
<td>Roger. Understand. Copied.</td>
</tr>
<tr>
<td>08 19 03 05</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS Carnarvon. S-band volume up in 1 minute for Honeysuckle.</td>
</tr>
<tr>
<td><strong>HONEYSUCKLE (REV 133)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08 19 04 49</td>
<td>CC</td>
<td>Apollo 7, Houston through Honeysuckle.</td>
</tr>
<tr>
<td>08 19 05 41</td>
<td>CC</td>
<td>Apollo 7, Houston through Honeysuckle.</td>
</tr>
<tr>
<td><strong>HUNTSVILLE (REV 133)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08 19 27 23</td>
<td>CT</td>
<td>Huntsville AOS.</td>
</tr>
<tr>
<td>08 19 27 46</td>
<td>CU</td>
<td>Apollo 7, Houston through Huntsville.</td>
</tr>
<tr>
<td>08 19 27 51</td>
<td>CDR</td>
<td>Roger, Bill.</td>
</tr>
<tr>
<td>08 19 27 53</td>
<td>CC</td>
<td>And we'd like the O₂ tank 2 fans ON 3 minutes and then OFF.</td>
</tr>
<tr>
<td>08 19 28 00</td>
<td>CDR</td>
<td>Roger. ...</td>
</tr>
<tr>
<td>08 19 28 37</td>
<td>CT</td>
<td>Houston, Huntsville cannot lock, downlink too low.</td>
</tr>
</tbody>
</table>
08 19 28 56 CC Apollo 7, Houston. Would you say again last?
08 19 29 02 CDR Roger. ...
08 19 29 33 LMP Hey, Bill, we've got the SPS line heaters OFF and are leaving them OFF now.
08 19 29 39 CC Okay. Roger.
08 19 32 34 CT Huntsville LOS.
08 19 35 38 CC Apolo 7, Houston. How do you read?
08 19 35 42 LMP Loud and clear.
08 19 35 44 CC Roger. I was having difficulty reading you at Huntsville. I read you to say line heaters were OFF and that you were leaving them OFF. Was that correct?
08 19 35 59 LMP No, the line heaters are OFF. We're leaving them OFF, and we also turned the fans OFF on the O₂ tank 2.
08 19 36 05 CC Roger. Did you cycle them?
08 19 36 07 LMP Sure did.
08 19 36 08 CC Roger. Thank you.
08 19 38 46 CC Apollo 7, Houston.
08 19 38 48 CDR Go ahead.
08 19 38 49 CC I have some information here on landmark tracking that might be helpful. If you desire to get your landmark maps in order, the following landmarks will be on track for the first landmark exercise. I'll stand by until you're ready to copy.
Okay, Bill. Roger. You just going to read off the numbers, right?

Affirmative.

Okay. Go ahead with the numbers.

20, 48, 71, 225. That's it. Note: we will have landmark update for you at 212 plus 30. An additional note for clarification, also, landmark 48 is on the page for landmark 40 in your map set.

Okay. Thank you.

Roger.

You got any idea of the weather along these marks, Bill? Are they all clear?

Stand by. That's a good question.

Apollo 7, Houston. I have the weather on those landmarks.

Go ahead, Bill.

Roger. For landmark 20, the coverage is four-tenths, for landmark 48, coverage is two-tenths; 71, three-tenths; 225 is one-tenth.

Roger. Thank you.

Houston, Apollo 7.

Apollo 7, Houston.

Looks like you got me set up for about the maximum perigee torque I can get.
Stand by.
Yes, we'll go ahead with it - I think we've got plenty of fuel. No problems.
Okay. We'll check.
I'm going to try to give this thing the most torque I could in perigee. This is the way I planned. That's about 60 degrees off.

Apollo 7, Houston.

Roger.

Roger. This is the same thing that we had last night. Donn questioned us on it, and it was a good question then and it is now, and the answer is that we realize what you're saying is true, but in order to get the test performed above 200 miles, we have to start it low like this.

Roger. It's amazing that the ... of people can figure it out up here and those computers can't.

Okay.
If you get a chance, get some more data on this perigee torque.

Roger.

Apollo 7, Houston through Canary.

Roger.

Say, Donn, I have a little tweak on that P22 horizon sighting procedure.
Roger. We want to get TM mn and the procedure has been modified as follows: One, do the test over Ascension on the next pass. That will be at approximately 213 plus 37 and wait for call from ground before starting. We want TM lockup for data, and this is a low elevation pass. Two - and this is a change from the previous procedure - go through P22 twice making two marks approximately 5 seconds between marks. Before going through P22 the second time, wait for a GO from ground. Again, we want to insure that we have a TM lockup.

Okay. You want this TM at 213 plus 37?
Affirmative.

Do you want me to wait for you to confirm that you have a lockup, is that correct?
Affirmative.

And you want to go through twice, and you want to do marks 5 seconds apart.

Two marks. That's right. But we only need two marks each time.

Oh, just two marks, right?
Affirmative.
<table>
<thead>
<tr>
<th>Time</th>
<th>Type</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 20 15 19</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive.</td>
</tr>
<tr>
<td>08 20 22 07</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS Tananarive; Carnarvon at 29.</td>
</tr>
<tr>
<td>08 20 29 47</td>
<td>CC</td>
<td>Apollo 7, Houston through Carnarvon.</td>
</tr>
<tr>
<td>08 20 29 51</td>
<td>CDR</td>
<td>Roger. I wish you would find out the idiot's name who thought up this test. I want to find out, and I want to talk to him personally when I get back down.</td>
</tr>
<tr>
<td>08 20 30 02</td>
<td>CC</td>
<td>Roger, Wally. Good morning.</td>
</tr>
<tr>
<td>08 20 30 05</td>
<td>CDR</td>
<td>Good morning.</td>
</tr>
<tr>
<td>08 20 30 07</td>
<td>CDR</td>
<td>Where is Jack? They told me I was out about 20 pounds of fuel to get this attitude right now.</td>
</tr>
<tr>
<td>08 20 30 14</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 20 30 15</td>
<td>CMP</td>
<td>While you are at it, find out who dreamed up P22 horizon test; that is a beauty also.</td>
</tr>
<tr>
<td>08 20 30 20</td>
<td>CC</td>
<td>Okay, Donn.</td>
</tr>
<tr>
<td>08 20 30 25</td>
<td>CMP</td>
<td>I understand the objectives, and I understand the reason, but I just don't understand all the changes and so forth at the last minute. I think it's rather ill prepared and hastily conceived.</td>
</tr>
<tr>
<td>08 20 30 36</td>
<td>CC</td>
<td>Roger.</td>
</tr>
</tbody>
</table>
I'm sitting just watching roll beat back and forth plus two-tenths of a degree per second. I have got to do better than that.

Jack, I need one question answered on this landmark jazz, too. I guess the idea is to put the sixth landmark on the horizon. Now what do you want me to do with the line of sight on the right, with the movable one? Do I make it the zero optics, or do you want me to run it off so that we are looking only through the sixth line of sight with a filter in it?

Okay. Donn, I will get you an answer.

Okay.

Other than that, we are real happy this morning.

Navy won, and so did Ohio State.

How did Stanford do, by the way?

Just a minute; I'll get it for you.

Apollo 7, Houston.

Go ahead.

Roger.

Go ahead, Jack.

Okay. In answer to Donn's question on the landmark line of sight on the horizon: you can move the star line of sight away from the horizon to get rid of the earth's albedo effect.

Okay. I see.
And, Wally, you - the answer to your question: Stanford and Washington played to a 21-21 tie.

Very good, or very bad, just depending.

Thank you.

Roger.

We have a feeling you are believing that some of these experimenters are holier than God down there. We are a heck of a lot closer to Him right now.

Roger. (Chuckle)

What we just did was spend 26 minutes getting to a very precise attitude, then high pick and right through perigee.

Roger. Copy, Wally.

Pulses started just about 4 minutes ago when it appeared.

Can't even get a roll to get it down.

Could we have opposite omni, 7?

Roger.

Apollo 7, Houston.

Go.

Okay. We are close to losing you here at Carnarvon; we do have Honeysuckle. Do you want to turn your S-band up? Over Hawaii, we are going to send you a state vector update, and I've got the lunar - I mean this landmark tracking pass for you.
HONETSUCKLE (REV 13½)

08 20 40 24 CMP Houston, Apollo 7.
08 20 40 26 CC Go ahead, Donn.
08 20 40 31 CC Apollo 7, Houston.
08 20 40 36 CMP Houston, Apollo 7.
08 20 40 38 CC Apollo 7, Houston.
08 20 40 40 CMP Roger. You want to give me those updates now, Jack?
08 20 40 44 CC Okay, Donn. I can do it.
08 20 40 48 CMP Fire away.
08 20 40 50 CC There are three landmarks. Number 1 is 48.

It's north of ground track 49 miles. The time, 21½ plus 55, shaft 327, trunnion 033. And the second one, Donn, is 71. It's 4 miles south of ground track, 21½ plus 59, shaft 002, and a trunnion 030. We're giving you these two, and we're just going to let you choose which one of the two that you think you would rather do. The weather is about the same in both of these.

You can choose either one of those, and the second landmark is number 225. It's 44 miles north of ground track, DT is 215 plus 21, shaft 340, the trunnion 030.

08 20 42 18 CMP What happened to landmark 20?
Okay. Donn, that's so close to the other two that we thought we'd rather not do it. I can give you the data. It's only 4 minutes before landmark 48, so we kind of thought that was too close for you.

Well, give me the data anyway.

Okay. Landmark 20 is 51 miles north of ground track. It's 21° plus 51 on the GE; shaft 329, trunnion 032.

Say again the landmark 225. How far north or south?

Landmark 225 is 44° miles north of ground track.

Okay.

And, Donn, landmark 20 is about four-tenths covered. That's about the worst of all of them.

Okay.

He should know where 20 is by now.

Say again, Donn.

I said Donn should know where 20 is, at least.

We're about 2 minutes LOS Honeysuckle; we'll pick you up in Hawaii at 56.

Okay.

Apollo 7, Houston through Hawaii.
08 20 56 56  CDR  I finished the so-called pitch pony test, and I think you might take note of the fuel we have left after that caper. I wish you would log that.

08 20 57 10  CC  Okay. Wally, I'm going to be coming back with you. It's a real good back on your fuel usage. We've really been watching that closely.

08 20 57 18  CDR  We've got the fuel to burn, but that's a hell of a way to burn it up.

08 20 57 21  CC  I agree.

08 20 57 50  CC  Okay. Wally, right now we show that you've used 13 pounds in the PTC test, which is right on what we expected, and -

08 20 58 03  CDR  We could cut that to about 4 pounds, I bet.

08 20 58 07  CC  Could you go to P00 and ACCEPT, and we'll send up this state vector? And I have the NAV check whenever you're ready.

08 20 59 08  CDR  Go ahead, Jack.

08 20 59 11  CC  Okay. 214 plus 20 plus all balls minus 0921 plus 14534 2341.

08 20 59 34  LMP  Roger. Could you read it to me again, please?

08 20 59 36  CC  Roger. 214 plus 20 plus all balls minus 0921 plus 14534 2341.

08 21 00 16  LMP  Jack, I'm sorry. Would you give it to me one more time?
Okay. 21½ plus 20 plus all balls minus 0921 plus 1h53h 23h1.

Roger. 21h 20 0000 minus 0921 plus 1h53h 23h1.

You got it.

Hey, Jack, what day - what meal are we supposed to be eating around noon?

You want to know what your eat period is?

No, what meal I'm supposed to eat next.

Okay. Stand by.

I think we've got a minor crisis.

Roger.

Apollo 7, the computer is yours.

GO on the NAV check.

Okay. Copy that.

We have a feeling that the dietician thought we were on a 10.8 day flight which means like 11 working days. The flight plan, however, has 12 working days. It looks like we're one day short on chow.

Okay. Wally, we're just coming up - we're 3 hours short of starting our tenth day, so this would be meal C on the ninth day, or meal A on the tenth day.

Roger. It's meal B. Like everybody else, we eat three meals a working day.
08 21 03 48  CC  Roger.
08 21 10 17  CC  Go ahead, Apollo 7.
08 21 12 42  CC  Apollo 7, a picture's coming through.
08 21 12 48  CDR  Roger.
08 21 12 50  IMP  We have ALC in on that right now.
08 21 12 54  CC  Okay. Looks good.
08 21 12 56  IMP  Out. We have it out. Well, one way or the other, anyway.
08 21 13 08  IMP  If you don't like it, we can change the ALC.
08 21 13 10  CC  Okay.
08 21 13 12  CDR  ... is just coming up.
08 21 13 25  CC  That looks real fine. It's a real good picture.

HAWAII through BERMUDA (REV 135)

08 21 16 14  IMP  Jack, is this the pass that takes us up by Tucson?
08 21 16 55  IMP  There's a beautiful sight today. The sun's lighting up the whole Gulf of Mexico.
08 21 17 04  IMP  We can see Lake Okeechobee from here.
08 21 17 15  IMP  Houston, Apollo 7.
08 21 17 18  CC  Roger. Go ahead, 7.
08 21 17 19  IMP  Roger. There's a beautiful lighting ... around here.
08 21 17 29  CC  It looks like Donn needs a shave.
08 21 17 31  CDR  I think we all do.
08 21 17 40  CC  If anybody is near the camera, they might switch the ALC position.
Okay.

I think it was better the other way.

Okay. We'll go back.

It looks like a beautiful day all the way from - beginning with the Gulf Coast on around to the tip of Florida.

That's good news.

Could we have opposite omni, Apollo 7?

Roger. Do you still have the picture?

We've still got it; we've got it for a couple more minutes.

Looks like you're doing a little looking for landmarks, Donn.

... That's one of the most spectacular sights I've seen, just now, all the way across the States. You can see the whole Florida peninsula lit up by the sunrays. It's morning, of course, all the way from the west coast, all the way across the Gulf Coast.

Copy that.

Hey, Jack, on magazine R, frames 58, 59, and 60 were taken looking towards Florida on this pass.

Okay. I log that.

The last one is looking down at the Cape. Got a lot of sun coming in the lens; I hope we have some nice pictures of it.
Yes, we can see it's pretty sunny in there.
Hey, Walt.
Yes?
What's the coil-like wire that's coming right in front of the lens there?
See that?
Yes, we can see it.
That's the water gun.
That's what we thought.
Can you actually see all three of us sitting in here like this?
I can just barely see you. It looks like you're chewing on something, and I can see Donn real good, but I can't see Wally.
Donn came up to join us especially for the show.
Okay.
He has been down below with the computer.
I can see Wally now. He's just handing - no, that's Donn that has the map.
They don't let me up here very often.
Only for the show.
Roger.
Somebody has to pump the pedals down there to keep us going.
Copy that.
<table>
<thead>
<tr>
<th>Time</th>
<th>Code</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 21 23 31</td>
<td>CC</td>
<td>It looks like we're just about to lose the picture.</td>
</tr>
<tr>
<td>08 21 23 45</td>
<td>IMP</td>
<td>Did you see the beards we've got up here, Jack?</td>
</tr>
<tr>
<td>08 21 23 48</td>
<td>CC</td>
<td>Sure can.</td>
</tr>
<tr>
<td>08 21 23 53</td>
<td>CC</td>
<td>Okay. The picture's fading now. You can let Donn go back to work.</td>
</tr>
<tr>
<td>08 21 24 29</td>
<td>CMP</td>
<td>Roger, Jack. I'm only allowed up - I can only get up here for special occasions like SPS burns and TV shows.</td>
</tr>
<tr>
<td>08 21 24 37</td>
<td>CC</td>
<td>Copy that. You can go back to work now. The TV's OFF.</td>
</tr>
<tr>
<td>08 21 36 49</td>
<td>CC</td>
<td>Apollo 7, Houston through Ascension.</td>
</tr>
<tr>
<td>08 21 37 06</td>
<td>CC</td>
<td>Apollo 7, Houston through Ascension.</td>
</tr>
<tr>
<td>08 21 37 27</td>
<td>CC</td>
<td>Apollo 7, Apollo 7. Do you read, Houston?</td>
</tr>
<tr>
<td>08 21 37 47</td>
<td>CC</td>
<td>Apollo 7, Apollo 7. Do you read, Houston?</td>
</tr>
<tr>
<td>08 21 38 00</td>
<td>CC</td>
<td>Apollo 7, Houston. Opposite omni.</td>
</tr>
<tr>
<td>08 21 38 15</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>08 21 38 21</td>
<td>CDR</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>08 21 38 22</td>
<td>CC</td>
<td>Okay. We've got good solid TM. You can start P22.</td>
</tr>
<tr>
<td>08 21 40 12</td>
<td>CC</td>
<td>Apollo 7, how are you doing with the marks on P22?</td>
</tr>
<tr>
<td>08 21 40 18</td>
<td>IMP</td>
<td>We're working on it.</td>
</tr>
<tr>
<td>08 21 40 20</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>08 21 40 27</td>
<td>CC</td>
<td>We're about 1 minute LOS Ascension; we get Tananarive at 50.</td>
</tr>
</tbody>
</table>
08 21 40 57 CC  Donn, if we lose you here, we want you to continue this thing, recording it in high bit rate; and then when you've finished the program, then go to your up telemetry to your COMMAND RESET back to NORMAL. We'll dump it back over the States.

08 21 41 12 CMP  Okay. And then you want high bit rate if we don't get it real time.

08 21 41 19 CC  Okay. Just about to lose you.

08 21 41 21 CMP  Roger. Jack?

TANANARIVE (REV 135)

08 21 52 54 CC  Apollo 7, Houston through Tananarive.

08 21 53 16 CC  Apollo 7, Houston through Tananarive. Standing by.

08 21 53 40 IMP  Houston, Apollo 7.

08 21 53 42 CT  Roger.

08 21 54 02 CC  Apollo 7, Houston.

08 21 54 05 CMP  This is Apollo 7. Do you read?

08 21 54 07 CC  Roger. You're about two-by, Donn. We're standing by here.

08 21 54 13 CMP  Okay. You're going to get some sleep remarks.

08 21 54 17 CC  Roger. Donn, could you give me an approximate GET. The tape was stopped on that P22.

08 21 54 26 CMP  Jack, I'll give you the rundown here. Do you read me okay?

08 21 54 30 CC  I'd rather get to wait till Carnarvon to get the rundown so I don't miss anything.
08 21 54 36 CMP  You won't miss a hell of a lot if you don't get it here. Okay. If you like, I'll give you a little preview. We did not get the results that you're after. We didn't get a damn thing, in fact. All we got was PROGRAM ALARM and a RESTART light and a CMC light.

08 21 54 51 CC  Roger. I understand; I copy you got a PROGRAM ALARM, RESTART, and a CMC light.

08 21 55 13 CMP  I still read your negative numbers, and it happened when I punched the PROCEED button and stepped in to the program, P20. I think it's a result of ... realign lights.

08 21 55 29 CC  Okay. Donn, you faded there, I didn't quite get it all.

08 21 55 36 CMP  I didn't get anything.

08 21 55 38 CMP  ... over Carnarvon.

08 21 55 51 CC  Okay, Donn. Copy. You didn't get anything in P22. We'll be with you over Carnarvon at 05.

08 22 05 36 CC  CARNAVRON (REV 135)

08 22 05 45 CMP  Apollo 7, Houston through Carnarvon.

08 22 05 50 CC  Carnarvon, Houston, Apollo 7. How do you read me?

08 22 05 50 CC  I read you five-by, Donn.

08 22 05 53 CMP  Okay. Jack, I don't know if you've got what I said at Ascension or not. Did you read all that?
Negative. You faded out at Ascension, and at Tananarive you were just about two-by, fading in and out also.

Okay. I'll start over. We got into the proper attitude, and I got the horizon into the sextant fixed line of sight. I ran through F22 as per your instructions, up through step 10, I believe, where you proceed, and the next display and - well, anyway, step 10, when I hit PROCEED, I got a PROGRAM ALARM, a RESTART light and a CMC light.

Okay, Donn --

I tried to ENTER on the VERB side to see what the alarm was, and the computer wouldn't take it. It was locked up tight. A few minutes later, we decided to try to unlock it, so we did the go-jam procedure. Hit RESET, marked REJECT and RESET at the same time, and that unlocked it. I looked at the program alarm and it was 1302, which says that the computer was trying to work with the square root of negative numbers. I think probably as a result of trying to do marks on the horizon which is a couple thousand miles away.

Okay. Donn, I want to ask you, on that step 10, when you were setting your option, did you use the unknown or the known --
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 22 07 16</td>
<td>CMP</td>
<td>I loaded in known landmarks.</td>
</tr>
<tr>
<td>08 22 07 18</td>
<td>CC</td>
<td>Okay. Copy that. That's what we wanted, and so we have got something to</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mull over down here on the ground.</td>
</tr>
<tr>
<td>08 22 07 27</td>
<td>CMP</td>
<td>You sure do. I want to compliment all the - whoever it was that thought</td>
</tr>
<tr>
<td></td>
<td></td>
<td>up that little rig, that one really got to us.</td>
</tr>
<tr>
<td>08 22 07 35</td>
<td>CDR</td>
<td>Jack.</td>
</tr>
<tr>
<td>08 22 07 36</td>
<td>CC</td>
<td>Okay, Donn - -</td>
</tr>
<tr>
<td>08 22 07 37</td>
<td>CDR</td>
<td>Jack.</td>
</tr>
<tr>
<td>08 22 07 39</td>
<td>CC</td>
<td>Go ahead, Wally.</td>
</tr>
<tr>
<td>08 22 07 40</td>
<td>CDR</td>
<td>I have had it up here today and from now on, I am going to be an onboard</td>
</tr>
<tr>
<td></td>
<td></td>
<td>flight director for these updates. We are not going to accept any new</td>
</tr>
<tr>
<td></td>
<td></td>
<td>games like gaining 50 feet to the DELTA-V counter for a burn, or doing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>some crazy tests we never heard of before.</td>
</tr>
<tr>
<td>08 22 07 54</td>
<td>CC</td>
<td>Roger - -</td>
</tr>
<tr>
<td>08 22 07 55</td>
<td>CDR</td>
<td>Each test is going to be reviewed thoroughly before we act on it.</td>
</tr>
<tr>
<td>08 22 07 59</td>
<td>CC</td>
<td>Okay. Understand that, Wally.</td>
</tr>
<tr>
<td>08 22 08 03</td>
<td>CDR</td>
<td>And I suggest that when something like this comes up again, that you</td>
</tr>
<tr>
<td></td>
<td></td>
<td>take it over the simulator, run it through, if it wrings out, we may try</td>
</tr>
<tr>
<td></td>
<td></td>
<td>it for you.</td>
</tr>
</tbody>
</table>
Copy. Could you give me the approximate GET that you went to COMMAND RESET, Wally?

It was only a few minutes after we left your - LOS last night, last night when you called.

Okay. Copy. Do you think you will be able to do the P22 landmark tracking now?

Jack, we went ahead and used your last NAV check for the update. It wrang out, so rather than taking erasable, we will go ahead and do the landmarks; and after that, we want to check the erasable.

Okay. Copy that. I have a voice P27 update to give you at this pass, too, over Carnarvon here.

What's behind that one?

That was part of the flight plan. It is just to give you prior to the landmark tracking here, in case you need it.

Okay. We buy it.

... kind of hard to us up here from now on.

Okay. And the other thing is on the P22 landmark tracking area, you going to do it? If you are going to maneuver in minimum impulse, we are recommending AC roll for quad balance. If you are going to use the DAP, we would
recommend failing quad A and B, this again for balance fuel.

08 22 09 37 CDR Are you saying that B and D is below A and C now?

08 22 09 44 CC No. A and C, A and B are the low quads, we would like to fail those and just maneuver in quad C and D, if you are going to use DAP control for this landmark tracking.

08 22 09 55 CDR We are going to use pulse, DAP is too expensive.

09 22 09 58 CC Okay. If you are going to use pulse, then in SCS, we would recommend AC roll and BD roll OFF, and the rest of the channels ON.

08 22 10 10 CDR Starting right now.

08 22 10 11 CC Okay.

08 22 10 14 IMP Ready to copy, Jack. Go.

08 22 10 16 CC Okay. This is state vector VERB 71: 216 plus 18 plus 00 21 01605 00001 75414 66060 13056 34401 06175 07200 50152 41550 70237 43677 03151 11244 11217 07040. The NAV check: 215 44 all balls minus 1995 plus 10145 2335. And could you delay the readback just a second?

08 22 12 10 IMP Roger. Readback follows: VERB 71 216 1400

08 22 12 20 IMP Did you say delay, Jack?

08 22 12 22 CC Roger. Delay just a second, Walt.
Okay, Wally?

Go ahead.

Okay. Because of the CMC light and the go-jam procedure, we have got to go back through and do a P51 and a P52, option 2. The T align time will be 215 plus 00 plus 00.

Roger. ... we can get it right now.

And I'm ready on the readback there, Walt.

Roger. Readback follows: VERB 71 216 14 00
21 01605 00001 75414 60601 13056 34401 06175
07200 -- 50152 41550 70237 43677 03151 11244
11217 07040 and I'll give you the T align time is 215 plus 00 plus 00. NAV check: 21544
4 ball minus 1995 plus 10145 2335. Over.

Roger. Voice P27 was correct, and your T align was correct also.

Okay. Thank you, Jack.

Jack, have you detected the concern? We got a computer that bogs under, and the reason I think you understand why.

Roger. It has concerned us equally as much, Wally.

I know, but we have a bigger problem right now.

Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 22 14 51</td>
<td>CDR</td>
<td>I hope everybody is learning that you don't make updates like that without a lot of thought. This is not a simple machine; it's very sneaky; it has a lot of steep paths in it, and I want everything validated before we train any more with it.</td>
</tr>
<tr>
<td>08 22 15 05</td>
<td>CC</td>
<td>Okay. Wally, we want to get a VERB 74; we would like to get an E mod dump here before you go over the hill. We are about 1 minute 15 seconds LOS.</td>
</tr>
<tr>
<td>08 22 15 15</td>
<td>CDR</td>
<td>We've got alignment coming up, sorry about that.</td>
</tr>
<tr>
<td>08 22 15 22</td>
<td>CC</td>
<td>Roger. Wally, we still would like to get that VERB 74 and catch the dump before you go over the hill.</td>
</tr>
<tr>
<td>08 22 15 27</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>08 22 15 41</td>
<td>CC</td>
<td>Okay. We are about 40 seconds LOS Carnarvon, we get Guam at 21.</td>
</tr>
<tr>
<td>08 22 15 49</td>
<td>CDR</td>
<td>Okay. Looks like we are in good shape here, line them up and continue.</td>
</tr>
<tr>
<td>08 22 15 53</td>
<td>LMP</td>
<td>You got the data dump, Jack?</td>
</tr>
<tr>
<td>08 22 15 56</td>
<td>CC</td>
<td>Just a minute.</td>
</tr>
<tr>
<td>08 22 16 03</td>
<td>CC</td>
<td>Okay. Keep dumping, Wally, as you go over the hill, and we'll get as much as we can.</td>
</tr>
<tr>
<td>08 22 16 09</td>
<td>CDR</td>
<td>Roger. -- Thank God this isn't tomorrow.</td>
</tr>
<tr>
<td>08 22 22 54</td>
<td>CMF</td>
<td>21½ hours and 22 minutes. Program 52 opposite 02, gyro torquing angles plus two balls 744</td>
</tr>
</tbody>
</table>
plus two balls \( \frac{376}{01696} \). Star distance angle of five balls.

08 22 23 14 CC Okay. Copied that, Donn.
08 22 23 17 CDR Hey, you're up, are you?
08 22 23 19 CC Roger. Read that.

HAWAII (REV 135)

08 22 32 16 CC Apollo 7, Houston through Hawaii.
08 22 32 22 CMP How does our erasable look, Jack?
08 22 32 26 CC It takes us 15 or 20 minutes, Donn, to have the people look at it in the back room.
08 22 32 32 CMP Okay.
08 22 32 33 CDR That's a lot better than they did when we had to dump it down at the Cape.
08 22 32 36 CC You're right.
08 22 32 38 CDR What was that? Three months?
08 22 32 44 CC We'll get you the word to that as soon as we can.
08 22 32 48 CDR Roger. Jack, we'll give that last goop to the lead, elbow, and pipe set.
08 22 33 46 CC Wally, I have the morning news and any football scores you're interested in.
08 22 33 52 CDR Roger. Go ahead.
08 22 33 55 CC Okay. Jackie Kennedy and Aristotle Onassis are to be married today on his island off Greece. They tell me that back here in Houston the city is sinking the last 65 years, that parts of the city have sunk as much as 6 feet. What scores would you like?
I've already heard that UCLA lost. How about the University of Houston?

They didn't play.

You might run up the score on our fuel so far.

Okay. In work.

That was a real load up as far as I could tell.

Roger.

Wally, we've got an RCS chart update for you.

Go.

Okay. 543 pounds.

543.

Roger.

Except for the burn, what did we accomplish with all that?

Say again, Wally.

Except for the burn 6, what did we accomplish today?

Well, we're going to get a lot of landmark tracking in, and I think that will pretty much accomplish what we set out to do.

Yes, we're going to burn on that, though. I haven't finished flying that part.

If we subtract out the burn there, burn 6, I'd say we blew about 25 pounds on those normal experiments.

Roger.
08 22 39 03  CDR  Jack, what's .... Do you read?
08 22 39 07  CC  Go ahead, Wally.
09 22 39 09  CDR  What's so discouraging is I sit up here and we pulse all over the place trying to save a couple of pounds of fuel, and some guy comes along and puts it in tight, tight, tight deadband right through perigee.
08 22 39 19  CC  Roger. Understand. We discussed all that before we read up the flight plan to you, and we really wanted to do it.
08 22 39 30  CDR  I understand that, but why do we have to have tight deadband and then turn it off to get a coding test? I can do that in pulse mode. I don't need to fly this spacecraft for 26 minutes in tight deadband and then let it drift. In fact, in the minimum pulse, I can get out of the thruster is pulse mode.
08 22 39 48  CC  Roger. I understand.
08 22 39 50  CDR  I wish somebody would make the people aware of that.
08 22 39 56  CC  Roger, Wally.
08 22 39 57  CDR  In tight deadband, it sits here and oscillates in roll alone, plus or minus two-tenths of a degree per second. In pulse, I can get about one-one-hundredth of a degree per second.
08 22 40 08  CC  Roger.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 22 40 10</td>
<td>CDR</td>
<td>That's what we are complaining about.</td>
</tr>
<tr>
<td>08 22 40 12</td>
<td>CC</td>
<td>I understand.</td>
</tr>
<tr>
<td>08 22 40 27</td>
<td>CDR</td>
<td>Jack, I would like to have you call Frank Borman and inform him he better go over his total flight plan from liftoff in real time and check his time line out for sleep, work cycles, and for food periods.</td>
</tr>
<tr>
<td>08 22 40 45</td>
<td>CC</td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>08 22 40 47</td>
<td>CDR</td>
<td>And not too soon.</td>
</tr>
<tr>
<td>08 22 40 49</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 22 41 39</td>
<td>CDR</td>
<td>HUNTSVILLE (REV 135) Jack?</td>
</tr>
<tr>
<td>08 22 41 40</td>
<td>CC</td>
<td>Go ahead, Wally.</td>
</tr>
<tr>
<td>08 22 41 42</td>
<td>CDR</td>
<td>Can you read the DSKY now?</td>
</tr>
<tr>
<td>08 22 41 45</td>
<td>CC</td>
<td>Negative. We've been handed over to the Huntsville. We don't get data there. We'll have to wait till California.</td>
</tr>
<tr>
<td>08 22 41 51</td>
<td>CDR</td>
<td>Okay. When we come over California, I'll show you what zero roll looks like and what zero yaw looks like in pulse.</td>
</tr>
<tr>
<td>08 22 41 57</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 22 42 00</td>
<td>CDR</td>
<td>We've got a lot of graphs going today.</td>
</tr>
<tr>
<td>08 22 43 08</td>
<td>SC</td>
<td>...</td>
</tr>
<tr>
<td>08 22 47 06</td>
<td>CDR</td>
<td>CALIFORNIA through ANTIGUA (REV 135) Houston, Apollo 7.</td>
</tr>
<tr>
<td>08 22 47 09</td>
<td>CC</td>
<td>Go ahead, 7.</td>
</tr>
</tbody>
</table>
08 22 47 10  CDR  Do you read the DSKY?
08 22 47 15  CC  Affirm.
08 22 47 16  CDR  Note roll and yaw. ... I didn't take the
26 minutes to get it that tight, either.

CALIFORNIA through ANTIQUA (REV 136)

08 22 51 26  CDR  Houston, from up here, we can't see Galveston.
08 22 51 30  CC  Roger.
08 22 51 31  CDR  You've got some high cirrus that blocks it
out on top of low altitude.
08 22 51 37  CC  Okay. Copy.
08 22 52 31  CDR  Jack, I don't know whether to pass this down
to you or not, but the light, sunlight - gives
us a hard time reading the DSKY and DELTA-V
counter, and the MET. We may need some shade
type device up here to permit us to read the
instruments.
08 22 53 01  CC  Okay. I've logged that.
08 22 53 03  CDR  That's what got to us on that 50 foot per sec-
ond overburn the other day. I'll have to reset
the DET now to get the MET. I can't read the
MET with full bright.
08 22 53 17  CC  Okay. I logged that, Wally.
08 22 53 19  CDR  Roger.
08 22 54 24  CT  You need the high bit rate or low bit rate.
08 22 55 23  SC  Frame 59, magazine R, Havana.
08 22 55 31  CC  Roger.
<table>
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<tr>
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<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>08 22 55 33</td>
<td>CDR</td>
<td>How, Jack, you can say today that we're a small moon over Miami.</td>
</tr>
<tr>
<td>08 22 55 38</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>08 22 55 46</td>
<td>CMP</td>
<td>Got 5 marks, Jack, on Coral Gables.</td>
</tr>
<tr>
<td>08 22 55 52</td>
<td>CC</td>
<td>Okay. Real fine, Donn.</td>
</tr>
<tr>
<td>08 22 55 54</td>
<td>SC</td>
<td>Or that key, whatever it is; Key Biscayne, I guess.</td>
</tr>
<tr>
<td>08 22 59 39</td>
<td>CC</td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>08 22 59 41</td>
<td>IMP</td>
<td>Go ahead, Jack.</td>
</tr>
<tr>
<td>08 22 59 43</td>
<td>CC</td>
<td>I have the PAD for this landmark - second revolution landmark tracking.</td>
</tr>
<tr>
<td>08 22 59 52</td>
<td>CMP</td>
<td>Wait one.</td>
</tr>
<tr>
<td>08 22 59 54</td>
<td>IMP</td>
<td>Jack, the second landmark is clobbered with clouds. I can't see it.</td>
</tr>
<tr>
<td>08 23 00 01</td>
<td>IMP</td>
<td>Okay. That's the number 71?</td>
</tr>
<tr>
<td>08 23 00 02</td>
<td>CC</td>
<td>Right.</td>
</tr>
<tr>
<td>08 23 00 10</td>
<td>IMP</td>
<td>Okay. Real fine.</td>
</tr>
<tr>
<td>08 23 00 12</td>
<td>CC</td>
<td>Go ahead, Jack. Ready.</td>
</tr>
<tr>
<td>08 23 00 12</td>
<td>CC</td>
<td>Okay. The first one is landmark 11, that's 5/4 miles north of ground track, 216 plus 23, shaft 325, trunnion 033. Number 2 - number 128, that's 1 and 1/2 miles north of ground track, 216 plus 34, shaft 000, trunnion 030. Third, number 144 at 16 miles north of ground track, 44, 350 shaft, 030 trunnion. Number 4 227, 45 miles north of ground track 216 plus 57 GET, 342 shaft, 029 trunnion, and that's all.</td>
</tr>
</tbody>
</table>
Roger. Jack, the last part I didn't get the - how far north or south.

Okay. The last one is 45 miles north of ground track.

Okay. I'll give you the landmark number, the GET, 227 for that one, 216 plus 57. Going back to the beginning with landmark 11, 216 plus 23; landmark 128, 216 plus 34; landmark 144 at 216 plus ...

Roger. You faded on the last one, 216 plus 44.

Right. On that one, what was the shaft angle?

Okay. Shaft was 350.

Thank you.

Okay. We are about 1 minute LOS Antigua. We'll pick you up at Ascension at 10.

Roger. Note 60 and 20 again.

Copy.

ASCENSION (REV 136)

Apollo 7, Houston through Ascension. Standing by.

Apollo 7, Houston through Ascension. Standing by.

Apollo 7, we're 1 minute LOS Ascension. We pick up Tananarive at 26.

Roger. We're GO here.

TANANARIVE (REV 136)

Apollo 7, Houston. Standing by Tananarive.

Apollo 7, Houston. Standing by through Tananarive.
08 23 32 40 CC Apollo 7, Houston. Two minutes LOS Tanamarive.
Carnarvon at 41.
CARNARVON (REV 136)

08 23 41 22 CC Apollo 7, Houston through Carnarvon. Standing by.
08 23 41 41 CDR Houston, the oxygen masks work very well.
08 23 41 45 CC Roger. Copy that.
08 23 50 14 CC Apollo 7, Houston. One minute LOS Carnarvon.
We'll pick you up at Guam at 53.
08 23 50 53 CC Apollo 7, Houston. To tell you that Guam is down,
we will pick you up at Hawaii at 08.
08 23 52 40 CT Go COMM TECH. We'll have Guam but not Guaymas.
GUAM (REV 136)

08 23 54 10 CC Apollo 7, Houston. Now through Guam. Standing by.
08 23 54 14 CDR Roger. Loud and clear.
08 23 54 16 CC You also.
08 23 54 18 CDR Roger. Donn and I tried out the oxygen masks,
and it was a ...
08 23 54 30 CDR Houston, did you read?
08 23 54 32 CC Say again, Wally.
08 23 54 34 CDR Donn and I tried out the oxygen masks; it was
a mandatory DTO.
08 23 54 40 CC Roger. Copy that.
08 23 57 48 CDR Houston, Apollo 7.
08 23 57 50 CC Go ahead, 7.
08 23 57 51 CDR Roger. We had a PROGRAM ALARM that anomadied
too fast. What we were doing was trying the
lights all turned out to see the computer exterior lights and had a GM1 power ... light -

That was when you turned the lights down you got it?

That's affirm. Oh no, we are not sure; I had the numerics down also. I brought the lights back up again, and the PROGRAM ALARM was on.

Yes, we can read it here, 1105.

Roger. Print. We tried to get in a variable in the exterior light, and we are trying to see if it came on.

Okay.

That occurred in PO0, by the way.

Roger.

Apollo 7, you are about 1 minute LOS Guam. We get Hawaii at 08.

Roger. Who is that superduper ... with you?

That's the number 1 substitute.

(Laughter) She's running along pretty well today.

Yes, all the systems looking pretty good, Wally.

Going to have to ask you to watch those new flight plan revisions, though.

You been east or north, I mean west or north?

Say again, you are coming garbled.

Have you been west or north?

Oh, north.
<table>
<thead>
<tr>
<th>Time</th>
<th>CDR/CC</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 00 03 20</td>
<td>CDR</td>
<td>How is it looking?</td>
</tr>
<tr>
<td>09 00 03 22</td>
<td>CC</td>
<td>Pretty good.</td>
</tr>
<tr>
<td>09 00 03 23</td>
<td>CDR</td>
<td>Good.</td>
</tr>
<tr>
<td>09 00 03 42</td>
<td>CDR</td>
<td>...</td>
</tr>
<tr>
<td>09 00 03 48</td>
<td>CC</td>
<td>We are just about LOS. We will pick you up at Hawaii.</td>
</tr>
</tbody>
</table>
Apollo 7, Houston through Hawaii. Standing by.

Roger.

We're refilling the PLSS tank; we took some oxygen out of it.

Roger. Copy that.

When we first picked up the masks, one of the test buttons was depressed, and we turned on the oxygen. We had full flow through it.

Okay. Copy.

It was still a mandatory DTO.

Did they make much noise, Wally, through that depressed button?

Yes, you could hear it very easily, Tom.

Okay.

But Donn and I were still grabbing for masks rather fast.

Okay.

Well, Wally, an interesting point: about 4 more hours the total man hours up there will exceed Gemini 7.

Four more; very good.

We don't have all the FM ON, but I can imagine DELTA-P lights are all three ON.

(Laughter) Affirm. Yes, we found out we had 11 days food for 12 days work, but we'll only be short one meal.
Roger.
I passed the word down for all command pilots
to check their flight plans from liftoff to
splash for work rest cycles and for meals.
Okay.
We ended up with 12 working days and about that
many days sleep.
Yes, we'll talk to you down at the Cape, too,
as soon as you get down there.
Roger.
Hey, Tom, what you might do is take a look at
these sleep-day awake cycles and pick out the
meal you want there, too. Sometimes they try to
slip a sleep cycle in between meal B and C, for
example, and you end up eating dinner for break-
fast if you follow this schedule.
Will copy.
Gemini 7, Cape.
Go ahead.
Okay. Let's try that one more time. Apollo 7
from Houston. Does that sound more up to date?
Roger. Check. Say again, Deke.
Hey, listen, let's go over this reentry thing
one more time since we've got a little slack
here in good communications. Let me tell you
what I - -
One of the things I plan on doing after we break off the burns today is put on my suit and see how we stand in the couch with the helmet off.

Roger.

I'd like to give you a report on that. That'll happen, oh, probably an hour and a half or 2 hours from now.

Okay. Let me tell you --

Go ahead.

Let me tell you what our recommendation is, and then your office is going to have to play it by the best knowledge you've got up there. Okay. We're recommending you come in with the torso on obviously for the leg protection which we talked about yesterday.

Roger.

And secondly, if you can valve salvo with the helmet popped loose, keep the helmet on at least down through 50,000. Pop it so you can clear your nose, and then have it on for protection on landing. That, of course, is optional. The glove situation is the same. I don't think it matters whether they're on or off. The backup to that would be to come in without helmets or gloves, and in that case, we think you ought to provide yourselves with some head protection on the head rest.
Roger. Our problem is if we pop the helmets off, we'll have to have the gloves off to get them back on.

That's correct.

And for restraint I don't think it's very hard to maneuver them around, and we're a little worried about getting them back on again, particularly if we pick up drogues and then the 1 g environment, and there we've got three bomb shells running around the cockpit with us on landing.

Yes, I think the glove situation is pretty clear cut. I don't think you ought to mess with those. I think it may be desirable to have head protection from the helmet on landing, however, if we can figure out how to do it.

Yes, we're keeping it and just cock it back and get to our noses.

That was what we were thinking.

But the odds of making up the neck rings again are pretty slim when we are restrained.

I suspect that's true, but I think you're probably still better off with the helmet on and the head loose than not on at all.

Okay. We'll play the game up here today.

Okay. Fine.

Roger. Thanks for at least giving us an option on it.
09 00 15 04 CC Roger.
09 00 18 02 LMP Hey, Deke, I hope somebody meets us with a safety razor on that carrier.
09 00 18 08 CC Say again, Walt.
09 00 18 11 LMP Somebody meets us with a safety razor on that carrier.
09 00 18 19 CC Roger. I think there may be a couple.
09 00 18 25 CDR The caption in the flight plan is beards are NO-GO.
09 00 18 30 CC Got that.
09 00 18 36 CDR ... that pulse control is beautiful.
09 00 18 41 CC Copy.
09 00 18 51 CDR Is Tom still there?
09 00 18 57 CC Roger.
09 00 18 59 CDR Okay. For roll, Tom, with one ring, it's 8 pulses for two-tenths of a second.
09 00 19 06 CC Yes.
09 00 19 08 CDR For pitch and yaw, it's about 10 pulses per two-tenths of a degree per second.
09 00 19 14 CC Okay. Got it, and that's using just the one ring there, right? Are you using just -
09 00 19 22 CDR Just rings in the roll, yes.
09 00 19 23 CC Yes.
09 00 19 24 CDR The pitch is pure.
09 00 19 25 CC Okay.
09 00 19 53 CC Apollo 7, Houston. Wally, does the sound on minimum impulse sound like Gemini with those cracks?
09 00 20 01 CDR  Negative. It sounds like, the best description
we've thought of is like hitting on steel drums
in a steel band.

09 00 20 08  CC  Yes. Okay.

09 00 20 12  CDR  It's sort of like the Gemini, but a lot worse.
Very discernible, every one of them.

09 00 20 18  CC  Okay.

09 00 20 20  CDR  They are in a different tune. The pitches are
about one note lower than yaw, and roll is sort
of an individual note.

09 00 20 28  CC  Okay.

09 00 20 45  IMP  Land ho.

09 00 20 50  IMP  Say, Jack, can you give me a map update for the
closest --

09 00 20 59  CC  Okay. Stand by. Okay, Walt, I've got it. Are
you ready to copy?

09 00 21 11  IMP  Go.

09 00 21 12  CC  Okay. You're coming up on REV 137 here. The
time 217 plus 25 plus 25. The longitude of the
node 144.1 degrees east.

09 00 21 32  IMP  Copy.

09 00 21 58  CDR  Frame 61, magazine R for Romeo, and ... very close
behind the time off the west coast.

09 00 22 08  CC  Okay.

09 00 22 11  CDR  And a very uninteresting ...

09 00 22 28  CDR  Our target is wide open.
09 00 22 30 CC Roger.
09 00 22 53 CDR Jack, if you'll watch the ... you'll see the trun-

09 00 23 04 CC Okay. We're watching P22.
09 00 23 06 CDR ... roll right about 5 degrees to optimize on the

target pickup.
09 00 23 16 CC Okay.
09 00 23 22 CDR Jack, you can see her sitting just about at ORB
rate, pitch down, a little bit to go. We got a
better view.

GUAYMAS through ANTIGUA (REV 136)
09 00 24 11 CDR Guaymas, we can see your station.
09 00 24 30 CDR Guaymas, Apollo 7. Buenos dias and muchas gracias.
09 00 24 41 CC We copied, Wally, but I don't know whether Guaymas

got it or not.
09 00 24 45 CDR Roger.
09 00 24 46 CC It sounds Spanish to me.
09 00 24 48 CDR Si.
09 00 25 06 CDR How's our cut for going over Mexico City?
09 00 25 14 CC Stand by one, Wally.
09 00 25 29 CC Okay. It looks like you're going to be coming
fairly close to Mexico City.
09 00 25 34 CDR Yes, it looks like that from the path we're going.
North or south? Looks like we're going to be north.
09 00 25 42 CC That's what we show.
09 00 25 44    CDR    Roger.
09 00 26 21    CDR    Tom, one of the real kicks out of this left seat
is you can sit here and just scrunch it down like
a submarine commander working with a periscope.
I've got the line in right now with number 1 eight
ball, and we can just cruise back and forth with
no strain at all.
09 00 26 36    CC    Okay. That's out of the number 1 window and the
eight ball.
09 00 26 38    CDR    Number 2 window and the number 1 eight ball.
09 00 26 41    CC    Roger.
09 00 26 42    CDR    You can drop it down about 2 or 3 feet on the
slightest motion. This IVA stuff is great sport.
No problem at all.
09 00 27 00    CDR    Out in front of the number 1 ball to take the
rates out.
09 00 27 08    CC    Wally, Houston. What about when you're in local
vertical in the dock position. Can you see the
horizon pretty well?
09 00 27 14    CDR    Yes.
09 00 27 18    CC    Okay. And I asked Donn late the other night when
you were asleep, to make some marks on that side
window just with a pencil so we can calibrate the
simulator later on, you know, for the attitude out
the side window.
09 00 27 27    CDR    Oh, you mean for zero pitch?
09 00 27 29  CC  Yes.
09 00 27 31  LMP  Tom, I can give you a couple of figures on that. If your head is laying in the center couch at zero pitch, the horizon cuts through right about the middle of the rear side of both number - both side windows, number 1 and 5.
09 00 27 46  CC  Okay. Got it. Thank you.
09 00 27 50  CDR  Now, you can't see across the cockpit and see the horizon, though. That's the center couch.
09 00 27 55  CC  Okay.
09 00 28 03  CDR  Don't give up that center window. That's a dream if they can get it to be fixed up right.
09 00 28 08  CC  Roger.

GUAM through ANTIGUA (REV 137)
09 00 34 53  CC  Apollo 7, Houston.
09 00 34 56  LMP  Landmark is a NO-GO with solid overcast.
09 00 35 00  CC  Okay. Copy. Wally, the power down that was scheduled at 217, we would like to delay that in order to get a state vector update to you probably through Guam about 217 30 and then we can power down after that.
09 00 35 22  CDR  Roger. Are you going to check our instrument, or have you found that it is all right?
09 00 35 25  CC  Okay. I haven't gotten the report on that, but I'm waiting for it, and I will get it up to you as soon as I get it.
09 00 35 31 CDR  I'd like to get that before we power down.  I'd rather not screw it up tomorrow.

09 00 35 36 CC  Okay.

09 00 35 38 CDR  What is the new time for power down?

09 00 35 41 CC  Okay.  The power down will be about one half hour later.  It will probably be about 217 45.  We want to get the state vector update at Guam, and if we don't finish it there, we'll get it through Hawaii.

09 00 35 55 SC  We'll keep a computer on the line till we get a GO on the erasable.

09 00 35 59 CC  Okay.  Real fine.

09 00 37 42 CC  Apollo 7, we'll pick you up at Ascension at 47.

ASCENSION (REV 137)

09 00 47 46 CC  Apollo 7.  Houston through Ascension.

09 00 47 50 CDR  Roger.  Loud and clear.

09 00 47 52 CC  Roger.  Wally, we have got an update on the flight plan for a sleep period here.

09 00 48 01 CDR  Go ahead, Jack.

09 00 48 03 CC  Okay.  OMF sleep period from 216 through 225, CDR and LMP from 225 to 234.

09 00 48 18 CDR  That's affirm, but ... maybe we can stuff into it.

09 00 48 39 CC  Walt, the nodal crossing on REV 137 is 114.1 east.

09 00 48 49 LMP  C1 137?

09 00 48 50 CC  Affirm.

09 00 49 37 LMP  On that last one, we got five marks and corrected the landmark.
09 00 49 43 CC Okay. Copy that.
09 00 49 46 LMF It was wide open on the coast only I found that the landmark had a three-fourths mile uncertainty, and we picked it up and got a picture of it, too.
09 00 49 58 CC Sounds real good, Walt.
09 00 50 04 CDR We are trying to get pictures of the landmarks that don't have any.
09 00 50 07 CC Okay.
09 00 50 28 LMF Hey, Jack.
09 00 50 30 CC Go ahead, Walt.
09 00 50 32 LMF Roger. We've taken numerous packs of 70mm, S0121. The first batch we took we shot at ASA 64 so we wouldn't have to reset the light meter for S0368, and all the other S0121 packs have been shot at an ASA of 50, and I would like to make sure that you get that to the people that process these. I've marked the pack that was shot at ASA 64.
09 00 51 01 CC Okay. Copy that.
09 00 51 13 CDR This is really a great machine for taking pictures out of. There are five windows; almost every time you glance up, there is one of us on it.
09 00 51 22 CC That sounds like a pretty good technique there, looking with one of the five windows there.
09 00 51 27 CDR ... We have really got a lot of good pictures.
09 00 51 32 CC Good show.
09 00 51 34 CDR I wish we had a heck of a lot more film up here.
Okay. We have 1 minute to LOS over Ascension, and we are going to give a data dump over Guam this time, Wally.

Roger.

TANANARIVE (REV 137)

Apollo 7, Houston through Tananarine. Standing by.

Apollo 7, we're about to lose you over Tananarine. We'll pick you up at the Mercury at 208.

MERCURY (REV 137)

Apollo 7, Houston through Mercury. Standing by.

... Wally, we will stand by for Guam.

Roger. Wally, we will stand by for Guam.

Are you going to update there?

Affirm. We are going to update at Guam.

When do you want the – are you going to go on the erasable?

Wally, we are going to make another erasable at Guam when we get a good elevation angle as a further check on the Carnarvon data which we are having a hard time getting back from Carnarvon.

Okay.

GUAM (REV 137)

Apollo 7, opposite omni.

Roger.

Apollo 7, Houston. If you will go to ACCEPT, we will send you the state vector update.
09 01 32 48  CDR  You got her.
09 01 32 50  CC  Okay. Coming up. Then I have the NAV check for
               you when you are ready to copy.
09 01 33 14  CDR  Go, Jack.
09 01 33 16  CC  Okay. 221 plus 30 plus 0000 minus 2953 minus
                 05172 1803.
09 01 33 41  CDR  Roger. 221 plus 30 plus four balls minus 2953
                 minus 05172 1803.
09 01 33 52  CC  Roger.
09 01 34 06  CC  Apollo 7, Houston. We are finished with the dump -
                 I mean, we are finished with the state vector up-
                 date.
09 01 34 14  CDR  Say again.
09 01 34 16  CC  We are finished with the state vector update. The
                 computer is yours.
09 01 34 19  CDR  Good.
09 01 34 22  CC  Okay, Apollo 7. We are ready for your E mod dump;
                 could you key in the --
09 01 34 29  CDR  Just a sec ond.
09 01 35 14  CDR  Houston, this is Apollo 7.
09 01 35 16  CC  Go ahead.
09 01 35 17  CDR  Okay. The computer system is clear.
09 01 35 21  CC  Okay. We are ready for the VERB 74.
09 01 35 44  CDR  Computer is syncing, apparently.
09 01 35 46  CC  Okay.
09 01 36 23  CDR  On the way down.
Roger.

Okay, Apollo 7. We are about to lose you here at Guam. We pick you up at Hawaii at 45.

...

Okay. Wally, we are through with the E mod dump. HAWAII (REV 137)

Apollo 7, Houston through Hawaii.

Roger. Loud and clear.

You too.

Apollo 7, Houston.

Roger, Jack.

Okay. Donn, it's going to be about an hour before we have a print-out of this E mod dump, and you can leave the computer powered up at your option.

Roger. Wilco; and Donn is in bed.

Okay. Somebody else has got a high voice then.

Wilco. Over and out.

Houston, Apollo 7.

Go ahead, Wally.

Can you read the DSKY?

Affirmative.

Notice how tight I'm holding it in. Pulse now.

Are you impressed?

Roger.

Pardon?
09 01 48 16  CC  Affirmative.
09 01 48 18  CDR  That's pretty tight, isn't it?
09 01 48 20  CC  Roger.
09 01 48 22  CDR  Come on, you can see through that one.
09 01 48 27  CC  What - have you got all the switches off, Wally?
09 01 48 31  CDR  The CDU's are locked up; the DMU is powered down.
        Donn just came out of his bed. He was wondering, too.
09 01 48 40  CC  I was looking at SGS rate.
09 01 48 43  CDR  No fair. That is pretty tight pulse, isn't it, Tom?
09 01 48 53  CC  Yes, that's really holding it.
09 01 48 56  CDR  Okay. I'll be a good guy.
09 01 49 04  CC  Well, Wally, next time around we will give you a call, and you should be passing over this Typhoon Gloria; and it will probably be nighttime, but you should see lots of thunderstorms down below you, just over the Mercury.
09 01 49 16  CDR  We got a picture of her earlier today.
09 01 49 19  CC  Okay.
09 01 49 20  CDR  She's pretty big one. I didn't see it; Donn did. And the eye was very apparent and a very large storm.
09 01 49 27  CC  Right. It's given the Mercury a few swells out there.
09 01 49 32  CDR  Ah ha. It reminds me of a former Mercury CAP COMM.
Has Alan B. been in today?

No. I was going to remind him of it, though, whenever I saw him.

(CDR)

(CDR)

No. I was going to remind him of it, though, whenever I saw him.

(Laughter)

GUAYMAS (REV 137)

Houston, Apollo 7.

Go ahead, 7.

Roger. Looks like the only DTO we still have running here, we got to make another cut at the CRYO stratification test. I'd like to know what are your intentions and what percentage to do that. I would like to not save that thing until Monday night, for example.

Okay. We will get it to you, Walt.

It takes quite a while till somebody pressurizes it. It will take a couple of hours, probably, to run both of them.

Okay.

Well, Jack, could you give me an update when the time is appropriate for us to look for Gloria?

Okay. Will do.

Good.

And I guess we need an update on our fuel expended for the day - actually, it should be the fuel remaining - for the chart.

Okay. In work.
09 01 55 19  CDR  Roger.
09 01 57 06  CC  Okay. Wally, on information, you should be ready to receive -
09 01 57 10  CC  7, are you reading? Houston.
09 01 57 12  LMP  Reading you now. You were cut out there, though.
09 01 57 15  CC  Okay. We had a handoff. You should be seeing Gloria about 219 plus 04, somewhere around that time, and the chart update values - 539.
09 01 57 32  LMP  Roger. Thank you, 539.
09 02 00 51  CC  Apollo 7, Houston. One minute LOS Guaymas; we will pick you up at Tananarive at 37.
09 02 00 57  SC  Roger.

TANANARIVE (REV 138)

09 02 38 50  CC  Apollo 7, Houston through Tananarive. Standing by.
09 02 39 39  CC  Apollo 7, Houston through Tananarive.
09 02 41 42  CDR  Roger. Tom, we're reading you.
09 02 41 44  CC  Roger. You reading us loud and clear?
09 02 41 48  CDR  There's the usual amount of noise.
09 02 42 04  CDR  - correction, 1 more day.
09 02 42 06  CC  Say again, Wally.
09 02 42 09  CDR  I think all of us are thankful we have 1 more day. ... then we can come back home again.
09 02 42 15  CC  Roger. Evidently you're reading us. We can barely read you. I'll give you a social update. Father is taking Jo to the ball game this
afternoon. In fact, Lo and Harriet are also going to the ball game.

09 02 42 32  CDR  Lo and Harriet going to the ball game, too?
09 02 42 34  CC  Roger.
09 02 42 38  CDR  What game is it?
09 02 44 10  CC  Apollo 7, Houston.
09 02 44 14  CDR  Go ahead.
09 02 44 15  CC  We would like to do a fuel cell $O_2$ purge.
09 02 44 23  CDR  I can't help you until we get acquisition.
09 02 44 28  CC  Thank you.
09 02 46 58  CC  Apollo 7, Houston. One minute LOS Tananarive;
Mercury at 01.
MERCURY (REV 138)

09 03 01 57  CC  Apollo 7, Houston through Mercury.
09 03 02 01  CDR  Roger, Jack.
09 03 02 03  CC  Walt, your E mod dump is GO. You can power down
the computer.
09 03 02 10  CDR  Roger.
09 03 02 33  LMP  Jack, who is playing the Oilers today?
09 03 02 37  CC  The Jets are playing the Oilers today.
09 03 02 41  LMP  Okay.
09 03 02 51  CC  Fendell's giving five points.
09 03 02 56  LMP  I'll take him.
09 03 03 24  LMP  Hey, Ed - I mean Tom, tell Ed I'll go for two
and take the Oilers and five.
09 03 03 31  CC  He's covered.
09 03 03 43  LMP  Candy from a baby.
09 03 03 45  CC  We'll call the results up in about 5 hours or so.
09 03 03 50  CDR  If we're blacked out up here, we'll power down
                 the computers shortly, and wait to see if Gloria's
                 hanging out around this area.
09 03 03 57  CC  Okay. You should be coming right up on it now,
                 Wally.
09 03 04 00  CDR  Roger.
09 03 04 02  LMP  I agree; nobody should miss Gloria.
09 03 04 09  CAF  It's a real big G, I guess.
09 03 04 13  CC  No comment.
09 03 05 35  CDR  We have a shoreline that seems very brightly
                 lighted up ahead of us here.
09 03 05 39  CC  Say again, Wally.
09 03 05 42  CDR  A shoreline about - oh, 50 or 60 miles long, and
                 it's lighted up; looks like about two or three
                 cities.
09 03 05 48  CC  Roger.
09 03 05 53  CDR  We saw some lightning, and a lot of it - oh,
                 about a minute or so ago.
09 03 05 58  CC  Roger. You should be passing over it about now,
                 or already passed over the main part of the eye.
09 03 06 03  CDR  Roger.
09 03 07 03  CC  Apollo 7, Houston. We're ready to purge the other
                 fuel cells.
09 03 07 08 LMP  Houston, this water gun after 10 days use is getting difficult to operate the trigger you use to squirt it; you have to force it back and forth. The cold water tap on the food preparation panel down there also seems to be getting just a little bit tough to operate.

09 03 09 00 CC  Okay. Copy that, Walt.

09 03 09 16 CC  Apollo 7, Houston. We ran into the same thing with the water gun in the later Gemini flights. It became stiffer as the days progressed.

09 03 09 27 LMP  Roger. Thanks.

   GUAM (REV 138)

09 03 12 28 CC  Apollo 7, Houston. One minute LOS Guam; we pick you up at Hawaii at 21.

09 03 12 35 CDR  Roger.

09 02 12 37 LMP  I don't know if we told you, but the water that seems to be the freest of gas is the hot water spout.

09 03 12 43 CC  Okay. Copy.

09 03 12 50 CDR  I think that's why we're fans of the reconstitutable food.

09 03 12 56 CC  Roger.

   HAWAII (REV 138)

09 03 22 11 CC  Apollo 7, Houston through Hawaii. Standing by.

09 03 22 15 CDR  Roger.

09 03 22 21 CC  Apollo 7, Houston.
09 03 22 25 LMP Yes, Jack.
09 03 22 27 CC Walt, what we would like to do is get - sometime here, get a heater profile on those SPS heaters. Can you copy? It won't take any attitude control or anything; just some heater ON times.
HUNTSVILLE (REV 138)
09 03 26 42 LMP How long will this thing take to run?
09 03 26 44 CC It's a total of 6 hours; I got some times here for you.
09 03 26 51 CC Okay. I'll stick with the flight plan, and we'll probably get finished up when Donn's up.
09 03 26 54 CC Okay. Real fine. Let me know when you are ready to copy.
09 03 26 59 LMP Okay. Are these the SPS line heaters that I asked you to turn on and check about 2 days ago?
09 03 27 03 CC That's affirmative.
09 03 27 06 LMP Okay. It's going to help to use the A/B position. I saw no change at all in the A position today.
09 03 28 14 CC Roger.
09 03 28 30 CC Wait, let me know when you are ready to copy this and the flight plan.
09 03 28 35 LMP I'm ready to copy.
09 03 28 36 CC Okay. At 220 plus 57, put the heater switch in A, the SPS line heater switch to A. Okay. At 223 plus 57, put the SPS line heater switch to A/B.
And, at - you want to terminate the test at 227 plus 11 or any time the propellant temperature or oxidizer T align temperature reaches 75 degrees.

Did you copy that, T?

Jack, I read termination, and I read the 223 plus 57, and after that I couldn't read you.

Okay. Let me give it again. We are over the Huntsville here, and I'm only reading about two-by. At 220 plus 57, SPS line heaters to A. At 223 plus 57, SPS line heaters to A/B. Terminate the test at 227 plus 11, or any time the propellant temperature, or line oxidizer line temperature reaches 75 degrees.

Jack, I assume you're collecting the data on it. Do you want any data from me?

Okay. Walt, the only thing we want you to note, if you switch the heater position when you are not in station contact, would you log the time.

Okay. Will you be in station contact at 220 plus 57?

Affirmative. These times are all predicated on being in station contact at that time.

Okay. Thank you.

Okay. We are about 1 minute LOS Huntsville; we'll pick you up at Tananarive at 220 plus 13.

Roger.
Huntsville LOS signal very weak; VHF down is also varying in amplitude. Huntsville LOS.

TANANARIVE (REV 139)

09 04 14 19 CC Apollo 7, Houston through Tananarive. Standing by.

09 04 14 27 LMP Roger. Jack, how do you read?

09 04 14 31 CC Reading you about two-by.

09 04 14 33 CMP - Yeah, would it be possible to slip that - piece that for F22 --

09 04 14 58 LMP Jack, would you check my running the hydrogen stratification test about 20 to 15 percent range or longer ... 

09 04 15 18 CC Walt, you're coming weak and garbled. Copied the "did I check about the stratification test." We are in the process of doing this now, seeing if we can move it up a little.

09 04 15 33 LMP Roger. Out.

09 04 22 32 CC Apollo 7, Houston. One minute LOS Tananarive; we pick up the Mercury at 37.

MERCURY (REV 139)

09 04 38 34 CC Apollo 7, Houston through the Mercury. Standing by.

09 04 38 40 LMP Jack, how do you read?

09 04 38 55 LMP Hey, Jack, how do you read?

09 04 38 57 CC You're about four-by, Walt.
Okay. I don't know if you read my last contact or not. I wanted to see if we couldn't schedule the CRYO stratification test for no less than 15 to 20 percent on the hydrogen and probably no less than 30 to 35 percent on the oxygen. This is to preclude being involved with it some time late Monday.

Roger. Wait, we're doing that. We're trying to move it up a little bit - oh, we're talking around 232 hours now.

Okay. Thank you very much.

Jack, we have a third crewman verifying all three oxygen masks now; I just made a mandatory test of the third one.

Okay. I copy that.

Apollo 7. Opposite omni.

And, Walt, I have the block data number 24 for you.

Roger.

I'm ready to copy, Jack, and tell John Llewelyn we're glad we never had to verify how accurate or inaccurate this stuff was.

Say again on that.

Tell John Llewelyn we're glad we never had a chance to verify the accuracy of these blocks.

Roger.

Jack. Go.

09 04 45 37  LMP  Roger. My readback follows: 141 dash Alfa Charlie minus 181 minus 0100 222 plus 51 plus 52 6955, 142 dash Alfa Charlie minus 040 minus 0080 224 plus 26 plus 00 6134, 143 dash Alfa Charlie plus 028 minus 0200 225 plus 58 plus 13 5734. Over.

09 04 46 09  LMP  It was just a break, Jack. 144 dash Alfa Charlie plus 101 minus 0210 227 plus 30 plus 62 5293, 145 dash 2 Alfa plus 230 minus 0270 229 plus 06 plus 36 3723, 146 dash 2 Charlie plus 288 minus 0270 230 plus 43 plus 18 3726. Over.

09 04 46 40  CC  Roger. That's got it, except that should be 142 dash Alfa Charlie.

09 04 56 46  LMP  HAWAII (REV 139)

09 04 56 50  CC  Houston, Apollo 7. Over.

09 04 57 00  LMP  Apollo 7, Houston through Hawaii.

09 04 57 03  CC  Roger.  SPS line heaters going to .
Can you give me a readout on my $O_2$ manifold pressure, please?

Roger. 102.

Roger. 102.

Can you hit me again with the manifold pressure?

103.

And the redundant component check is still in work. I'll give you a GO next sight.

Roger.

Hey, Jack. Redundant component check looks like it's GO.

Roger. Copy that.

Apollo 7. We are 1 minute LOS Hawaii; Ascension for a short pass at 221 plus 38.

Roger.

ASCENSION (REV 140)

Apollo 7, Houston through Ascension. Standing by.

It's about time you got back on.

Roger. A little garbled there, but good afternoon.

Good afternoon.

Hey, Ron. Log LMP for 25 clicks of water.

Roger. Six clicks?

Houston, Apollo 7. Over.

Houston. Go.

Roger. Ron, will you log me 25 clicks of water, please?
09 05 41 17 CC Wilco. Twenty-five clicks.
09 05 41 54 LMP Hey, Ron, we'll all be off COMM here for about 30 seconds. We are trying something.
09 05 42 00 CC 7, Houston. Say again.
09 05 42 04 LMP Roger. I will be off COMM for about 30 seconds here.
09 05 42 08 CC Roger.
09 05 43 16 LMP Back with you, Ron.
09 05 43 19 CC Roger. About LOS. We still show your secondary glycol loop activated.

TANANARIVE (REV 140)

09 05 52 32 CC Apollo 7, Houston through Tanaanarive. Standing by.

MERCURY (REV 140)

09 06 14 31 CC Apollo 7, Houston through Mercury. Standing by.
09 06 14 35 LMP Roger, Ron.
09 06 14 37 CC Roger. Loud and clear.
09 06 15 31 CC Apollo 7, Houston.
09 06 15 35 LMP Houston, Apollo 7.
09 06 15 36 CC Roger. We show the secondary loop still on. Is that your intention?
09 06 15 43 CDR It is off now.
09 06 15 48 CDR Ron, I just finished putting the suit on.
09 06 15 52 CC Roger.
09 06 15 53 CDR Without gloves - without a helmet. Do you read?
09 06 15 58 CC Roger.
09 06 16 00  CDR  And strapped in, blocking my feet up, and I feel that is the way we are going to come in Monday morning - Tuesday morning. It is with suits, no gloves, no helmets, and I'm going to pad the headrest on either side and wear our COMM carriers, not our lightweight headsets.

09 06 16 22  CC  Roger.

09 06 16 24  CDR  Our heads are still too stuffed up to try to come in with our helmets on and take them off and try to blow our nose.

09 06 16 34  CC  Roger. Understand.

09 06 16 37  CDR  Okay. You might pass it on to Deke that I actually got in with a suit on, strapped down and tried it out.

09 06 16 44  CC  Will do.

09 06 16 45  CDR  Very good.

09 06 18 31  CC  Apollo 7, Houston. Opposite omni.

09 06 20 56  CC  Apollo 7, Houston. One minute LOS; Hawaii at 34, and I may have some ball scores here shortly.

09 06 21 00  CDR  Roger.

HAWAII (REV 140)

09 06 34 51  CC  Apollo 7, Houston through Hawaii. Standing by.

09 06 34 55  CDR  I hear you loud and clear.

09 06 34 57  CC  Roger. The same.

09 06 35 00  LMP  What's the late news on a Sunday evening?

09 06 35 05  CC  I've got a final on the Dallas and Minnesota football game. Dallas 20, Minnesota 7.
09 06 35 11  CDR  That's nice. Any scores on the Oilers yet?
09 06 35 15  CC  No, they just started at three.
09 06 35 16  CDR  Oh, I see.
09 06 35 17  CC  I don't have the score yet.
09 06 35 24  CC  Looks like our Kansas boy, Jim Ryun, got second in the 1500 meters in the Olympics.
09 06 35 31  LMP  Oh, really. He's the miler, isn't he, Ron?
09 06 35 34  CC  Roger.
09 06 35 36  LMP  Who got first?
09 06 35 37  CC  Kip Kano of Kenya.
09 06 35 42  CDR  Yes, he's pretty reliable on it.
09 06 35 47  CC  Right.

REDSTONE (REV 140)

09 06 47 33  CC  Apollo 7, Houston through Redstone.
09 06 47 37  CDR  Roger.
09 06 47 39  CC  Roger. When you get a chance, request pyro A and B volts and batt C volts.
09 06 47 54  LMP  Roger, Ron. Batt C is reading 36 volts.
09 06 47 57  CC  Roger.
09 06 48 15  CDR  Looking over tomorrow's flight plan.
09 06 48 19  CC  Go.
09 06 48 21  CDR  I see no hole for the TV game, except for the 237-hour period. And there I think we would have it as a very passive affair, where we don't do anything to set it up; just hook it up and let her rip.
09 06 48 44  CC  Roger.
09 06 48 47 CDR  Now the next period just prior to 239 hours,
I'd say we were busy.

09 06 48 39 CC  Roger.

09 06 49 00 CDR  So during that ninth period, I guess we'll come
across the States, the 237 plus 30. Looks like
we could do it if we just plug it in and turn it
on.

09 06 49 16 CC  Roger. I'm not sure what we had scheduled or if
we had any. Let me check, and I'll pass the word
up.

09 06 49 21 CDR  We're not volunteering; that's our only out, though.

09 06 49 23 CC  Roger.

09 06 49 27 LMP  Our series ends tomorrow.

09 06 49 31 CC  Hey, that's right.

09 06 49 36 LMP  Yes, we had it ... coming on Monday morning,
Tuesday morning, correction.

09 06 49 43 CC  Right.

09 06 49 44 LMP  Telling you ahead, happily.

09 06 49 45 CC  That's good.

09 06 49 48 LMP  Pyro A 36.8, pyro B 36.8.

09 06 49 53 CC  Roger. And I have your ampere-hours remaining.

09 06 50 00 LMP  Roger. Wait one - look, I've got another hour
to run on SPS line heaters A before going to A
slash B, right?

09 06 50 12 CC  Concur.

09 06 50 15 LMP  Go ahead with batteries.
09 06 50 16  CC  Batt A 26.7; correction, 27.6 for batt A. Batt B 25.2, batt Charlie 39.5.
09 06 50 41  LMP  27.6, 25.2, 39.5.
09 06 50 44  CC  Roger.
09 06 53 17  CC  Apollo 7, Houston. One minute LOS; Ascension at 12.
09 06 53 24  SC  Right.
09 07 12 34  CC  ASCENSION (REV 141)
09 07 12 38  LMP  Apollo 7, Houston through Ascension. Standing by.
09 07 12 40  CC  Roger. Loud and clear.
09 07 16 55  CC  Roger. The same.
09 07 16 58  LMP  Go ahead.
09 07 17 00  CC  Apollo 7, Houston.
09 07 17 04  CC  Roger. Walt, you might be interested to know that when you were operating on the secondary loop there, the primary outlet temperature went down to about 9 to 10 degrees.
09 07 17 14  LMP  Glycol evaporator outlet?
09 07 17 16  CC  Negative. Your radiator outlet temperatures.
09 07 17 22  LMP  Okay. The heaters didn't come on, though, huh?
09 07 17 27  CC  Negative. Everything is operating normally now, though.
09 07 17 36  LMP  Did it go down to plus 9 or 10, or minus?
09 07 17 39  CC  Plus. Plus 9 or 10.
09 07 17 43  LMP  Okay. No sweat. That's my fault, Ron. We were busy fiddling around here with the reentry plans, checking out the couch stuff.
09 07 17 51  CC  Roger. I just thought, maybe, you'd be interested.
09 07 17 57  LMP  Hear it's brisk.
09 07 17 59  CC  It sure is.
09 07 18 03  LMP  Do you have a copy of our canister card there?
09 07 18 08  CC  Wait one, and I can pick it up.
09 07 18 10  LMP  Okay.
09 07 18 56  CC  7, Houston. I have it now.
09 07 19 14  CC  Apollo 7, Houston. I have your canister card now.
09 07 19 17  LMP  Roger. We just did change number 19.
09 07 19 21  CC  Roger.
09 07 19 24  LMP  Which puts canister 21 in.
09 07 19 26  CC  Roger. One more to go.
09 07 19 31  LMP  And then they had it that way, but we'll do it.
              I think we'll put number 1 back in again and
              we're all done.
09 07 19 39  CC  Roger.
09 07 19 44  LMP  Both ... guys are getting along. We found we were
              out of a meal when we got all done today, too.
09 07 19 53  CC  I see what you're saying.
09 07 20 05  LMP  There's no crisis there. We're just thinking
              about it.
09 07 20 11  CC  Roger.
09 07 20 39  CC  Apollo 7, Houston. One minute LOS; Mercury at 50.
09 07 20 43  LMP  Roger.
              MERCURY (REV 141)
09 07 52 28  CC  Apollo 7, Houston through Mercury.
09 07 52 33 SC Roger. I read you loud and clear.
09 07 52 36 CC Roger. The same. We have no data from Mercury this time.
09 07 52 41 SC Okey.
09 07 52 44 CC We'd like to delay switching to AB on the SPS line heaters until we acquire Guam.
09 07 52 54 SC What's wrong down there?

GUAM (REV 141)

09 07 55 57 CC Apollo 7, Houston.
09 07 56 01 SC Go ahead – go ahead, Ron.
09 07 56 06 CC Roger. We're using the FM BIOMED channels for some special instrumentation that are different instrumentation. So we'd like to cycle the CRYO fans, tank 2 fans, once we acquire Guam. Now, I'll give you the go on it.

09 07 56 24 SC Roger.
09 07 58 04 SC Say, Ron, you have a map update for us?
09 07 58 44 CC Affirmative.
09 07 58 59 CC 7, are you ready to copy?
09 07 59 01 CDR Go.
09 07 59 03 CC Roger. REV 141 GET 233 plus 26 plus 34, longitude 21.7 east.
09 07 59 25 SC Ron, do you mean 223 or 233?
09 07 59 29 CC Roger. I mean 223 – 223.
09 07 59 35 SC That's a real up update?
09 07 59 38 CC Yes.
09 07 59 44 CT Fly D time we have a high rate data.
09 07 59 48 CC ... we'll have that redone.
09 07 59 53 CC Apollo 7, Houston. Request SPS line heaters to
A/B and your temperature readout.
09 08 00 02 SC Well, we were right there when you called for it,
and I'm reading on my gage, for what it's worth,
about, oh, 67.
09 08 00 17 CC Roger.
09 08 00 28 CC Wait, we're reading 65 down here, and we'll delay
the CRYO tank fan cycle until Redstone. Not
enough time, now.
09 08 00 37 CDR Well, I can do it by myself, can't I
09 08 00 39 CC Negative. We'd like to get some – we've got
some special readouts coming down on it. We'd
like to pick it up over a station. Both the ON
and the OFF cycle of the fans.
09 08 00 48 CDR Okay.
09 08 00 58 CC And, 7, I have a one-line flight plan update.
09 08 01 03 CDR Go with it.
09 08 01 04 CC Roger. At 224 plus 47, it's a down voice backup
check over Ascension. We will command all switching
from the ground.
09 08 01 21 CDR Roger. I'll stand by, then.
09 08 01 24 CC Roger.
09 08 01 53 CC Approaching AOS Redstone at 21.
09 08 22 02 CC Apollo 7, Houston through Redstone.
09 08 22 07 SC ...
09 08 22 08 CC Roger. ... we're waiting for data before we cycle the CRYO fans.
09 08 22 17 SC You say you're troubleshooting the switch on the backup?
09 08 22 25 CC This is part of it, but we're using the FM that we use to have the BIOMED on it, to get some more data.
09 08 22 34 SC Roger. We've got that ...
09 08 22 38 CC Roger.
09 08 22 39 CC Apollo 7, Houston. Opposite omni.
09 08 22 54 CC Apollo 7, Houston. Request 0₂ tank 2 fan ON.
09 08 23 23 SC Roger. We have our ...
09 08 23 28 CC Roger. Twenty clicks for LMP.
09 08 23 45 SC ... 15 clicks?
09 08 23 48 CC Roger.
09 08 24 16 SC Say, Ron, we just went by the Tuamotu Archipelago out here, and for 4 minutes solid we went by coral reefs, atolls, I should say.
09 08 24 26 CC Roger.
09 08 24 30 SC That seems ... more than nothing at all.
09 08 24 34 CC Wow!
09 08 24 36 SC You should be locked up with him for 11 days.
09 08 24 40 CC That's right.
09 08 26 28  CC  7, Houston. I've got some football scores here.
       New York 20, Houston 14.
09 08 26 39  CDR  Bad news.
09 08 26 41  CC  Roger.
09 08 26 43  CDR  Are you sure that's the correct score?
09 08 26 47  CC  That's affirmed.
09 08 26 49  CDR  Looks like New York had a good day.
09 08 26 51  CC  Roger.
09 08 26 53  SC  ... only gave me five points.
09 08 27 17  CC  San Francisco was 26, New York 20; Cleveland 30,
       Baltimore 20; St. Louis 31, Washington 14;
       Chicago 29, Philadelphia 16; Green Bay 14 and
       Detroit 14.
09 08 27 45  SC  They are slowing down this year.
09 08 27 49  SC  Jack.
09 08 27 50  SC  What about the Rams?
09 08 28 26  CC  Apollo 7, Houston. O2 tank 2 fan OFF.
09 08 28 32  SC  Roger.
09 08 29 29  CC  7, Houston. One minute LOS; Ascension 47.
09 08 29 39  SC  Roger. What time Ascension?
09 08 29 44  CC  At 47.
09 08 29 45  SC  Roger.
09 08 30 29  CC  7, Houston. L.A. 27, Atlanta 14.
       ASCENSION (REV 142)
09 08 47 46  CC  Apollo 7, Houston through Ascension.
09 08 47 54  LMP  Roger. ...
09 08 47 57  CC  Roger.
09 08 48 15  CC  Apollo 7, Houston. Opposite omni.
09 08 48 41  CC  Apollo 7, Houston. Voice check. You'll be coming
down—down voice backup.
09 08 48 49  LMP  Very well. Do you want me to configure now?
09 08 48 51  CC  Negative. We have configured from the ground.
All you have to do is talk.
09 08 48 58  LMP  What am I here for?
09 08 49 00  CC  (Laughter) Just talk.
09 08 49 05  LMP  I'm testing down voice backup, and I wish I had
those little command switches so I could throw
my own.
09 08 49 11  CC  Yes, right. That's a pretty good deal; all you
punch is one button and it switches all those
things.
09 08 49 16  CC  Are you coming through?
09 08 49 17  LMP  That's right. Ask them if they can rock their
spacecraft down there, will you?
09 08 49 20  CC  Okay. That down voice backup, that's good voice;
nice and clear.
09 08 49 30  LMP  Okay. Would you ask them to please switch my
ranging back on and down voice back up to where
they would like it?
09 08 49 40  CC  Roger. Your ranging is still on.
09 08 49 44  LMP  Thank you. You get better down voice without it.
09 08 49 48 CC Roger. We concur, but we want to test it this way, also. That's why we're checking this time now, Walt, is ranging down voice backup.

09 08 50 08 LMP Say that again.

09 08 50 09 CC Roger. We are checking down voice backup along with ranging on this test.

09 08 50 14 SC I understand, Ron.

09 08 50 21 CC By the way, L.A. beat Atlanta 27 to 14.

09 08 50 28 SC Roger. They're still undefeated then. Right?

09 08 50 34 CC I assume so. San Diego over Denver 41 to 17.

09 08 50 44 LMP Okay. I'm going to bed. Good night, Ron.

09 08 50 47 CC Roger. Good night. We'll see you tomorrow.

09 08 50 50 CMP Hello, there.

09 08 50 51 CC Hey, good morning.

09 08 51 06 CMP How did the Oilers do?

09 08 51 10 CC Not too well. They lost to New York 14 to 20.

09 08 51 20 CMP Oh.

09 08 51 29 CC Hey, Donn.

09 08 51 31 CMP Yeah, Ron.

09 08 51 33 CC Roger. You better check your food. Wally said he was one meal short there and not quite sure where he's going to get it so you better check your food and see if he's eaten yours.

09 08 52 42 CMP Yes, thanks for the tip. I'll be keeping an eye on him --

09 08 52 48 CC Okay. --
09 08 52 53 CMP I don't know what he did while I was asleep.
09 08 57 21 CC Apollo 7, Houston. One minute LOS. Mercury at 26.

MERIDIAN (REV 142)
09 09 26 27 CC Apollo 7, Houston through Mercury. Standing by.
09 09 26 32 SC Roger. Houston, Apollo 7.
09 09 26 35 CC Roger. Loud and clear.
09 09 27 25 CC Apollo 7, Houston. Opposite omni.
09 09 33 49 CC Apollo 7, Houston. Opposite omni.
09 09 33 51 SC Roger.
09 09 37 11 CC Apollo 7, Houston. One minute LOS; Redstone at 57.
09 09 37 18 SC Roger, understand.
09 09 37 20 CC Roger.

REDSTONE (REV 142)
09 09 57 29 CC Apollo 7, Houston through Redstone.
09 09 57 34 LMP Roger. Houston, Apollo 7.
09 09 57 38 CC Roger. Loud and clear.
09 09 57 56 CC 7, Houston. We'd like to power up the CMC over Redstone and then power down over Ascension.
09 09 58 05 LMP Okay. Fine.
09 10 01 57 CC Apollo 7, Houston.
09 10 02 07 SC Roger, Houston. Go.
09 10 02 10 CC Roger. We're just about due for a cycle on our H₂ heaters, and we can finish this last CRYO H₂ stratification test there if it's convenient for you to turn the H₂ heaters and fans off at this time.
Roger. I can turn the heaters and fans off at this time.

Roger. Proceed and then this will start the H₂ CRYO stratification test.

All right. Fine. Starting at 26 02.

Roger.

7, Houston. We read 233 psi in tank 1 - H₂ tank 1 and 231.3 in tank 2.

Roger. 233, 231. Thank you, Ron.

Roger.

... our meters read - well it's a little hard to resolve it that close - I'd say about 228 and 226 on our meter.

Roger. Copy.

Looks like we're about 5 pounds below you.

Apollo 7, Houston. About 30 seconds LOS; Ascension at 23, and your state vector is good.

Okay. Thank you.

Apollo 7, Houston through Ascension.

Apollo 7, Houston through Ascension.

Roger. Houston, Apollo 7.

Roger. Read you, Donn.

Roger.

7, Houston. They verify SPS line heaters were turned off.
09 10 26 07 CMP Negative. They were not turned off. Did you want them off now?

09 10 26 10 CC Wait one; stand by.

09 10 26 38 CC 7, Houston. We were predicting that we would be up to 75 degrees here, but the curve tapered off, so we will advise when to turn them off.

09 10 26 47 CMP Okay. I'm still reading 72 degrees right now.

09 10 26 52 CC Roger. Concur.

09 10 26 54 CMP Could you give me the hydrogen pressures again, please?

09 10 26 59 CC Roger. Right now H₂ tank 1 232, H₂ tank 2 230.

09 10 27 10 CMP Roger.

09 10 27 26 CC And - Apollo 7, Houston - we're GO for OMC power down.

09 10 27 31 CMP Okay.

09 10 28 43 CC 7, Houston. Have you ever taken the optics eye-pieces off and looked through the optics out there?

09 10 28 53 CMP Have we taken them off, did you say?

09 10 28 54 CC That's affirmative, or do you normally leave them mounted in position?

09 10 29 01 CMP Oh, about fifty-fifty. Sometimes we put them away, and sometimes we just leave them there. It depends on what we're going to do; if we're going to be real active in the LEB doing other things, we usually put them away because they're in the way.
Roger. I've got a little degradation type thing I'll pass up to you here shortly.

Okay. Fact is, they're stored right now.

Roger.

Apollo 7, Houston. You can turn the H₂ heaters on now, and that stratification test at your convenience.

Okay. Heaters going on now.

Roger.

On this optics degradation, what we want to do is remove the sextant and telescope eyepieces, and then observe the internal lens of both the sextant and the telescope. This would be with your eyeball about a foot away from the panel during a dayside pass with the optics pointed somewhere above the horizon.

Optics pointed where, above the horizon?

Optics above the horizon. And you should be able to observe some deposits on this objective lens similar to the ones that are on the windows.

...get through the optics eyepieces.

CANARY (REV 143)

Say again, Donn.

I say with the eyepieces installed, the view - the optics are off through the telescope ... lifted off.
09 10 31 34 CC I still didn't copy that very well, Donn.
09 10 31 38 CMP Just disregard.
09 10 31 39 CC You're clear now; say again.
09 10 31 42 CMP Okay. When the eyepiece is installed, the view through the optics will be as good now as it was at the start of flight.
09 10 31 51 CC Roger. Understand. What we would like to do is get your evaluation with the eyepieces off and see if you can see any deposits on those lenses off.
09 10 32 00 CMP ...
09 10 33 44 CC Apollo 7, Houston. Thirty seconds LOS; Mercury at 03.
09 10 33 50 CMP Roger, Houston.
09 11 03 10 CC Apollo 7, Houston through Mercury. Standing by.
09 11 03 15 CMP Roger, Houston.
09 11 03 18 CC Roger.
09 11 05 04 CC Apollo 7, Houston. Opposite omni.
09 11 05 09 CMP Roger.
09 11 05 50 CC Apollo 7, Houston. SPS line heaters off.
09 11 05 57 CMP Roger. Give me a couple of minutes.
09 11 06 01 CC Roger.
09 11 10 06 CC Apollo 7, Houston.
09 11 10 17 CMP Roger. Go ahead, Ron.
Roger. On the H₂ pressures, we show 256 and 254.

Roger. Your H₂ tank pressures, 256 and 254.

And - 7, Houston - our oxidizer line temperature now reads 80 down here.

7, Houston. Thirty seconds LOS; Redstone at 32, and verify SPS line heaters off.

7, Houston. Verify SPS line heaters off. REDSTONE (REV 143)

Apollo 7, Houston through Redstone. Standing by.

Roger, Houston.

Roger.

I completed that stratification test, and there doesn't appear to be anything.

Roger. Copy.

Apollo 7, Houston. I have a flight plan update when you're ready to copy.

Okay. Ron, stand by for just one here.

Roger. No hurry.

Go ahead with your flight plan update, Ron.

Roger. At 228 plus 20, optics degradation test. That's what we were talking about a while ago. At 229 plus 50, oxygen fuel cell purge; at 230 plus 00 02, CRYO stratification test number 3. We will advise further details later.

Okay.
09 11 39 18  CC  At 232 plus 00, extend playmate's sleep period to 234 plus 00.

09 11 39 36  CMP  Roger. Got that.

09 11 39 39  CC  Normal SPS burn prop ACCEPT. At 236 plus 00, dump waste water to blank percent - it's about 50 percent. We'll update that later.

09 11 40 10  CMP  Okay.

09 11 40 11  CC  We want to get the right amount to be in the tank for deorbit.

09 11 40 19  CMP  Is there a right amount for deorbit?

09 11 40 20  CC  That's affirmative. They're full, in other words, for deorbit. About 90 percent is what we're trying for.

09 11 40 27  CMP  Oh, I see. Okay.

09 11 40 30  CC  At 236 plus 50, backup GDC/IMU alignment; delete SCS backup align. At 237 plus 16, TV turnon.

09 11 41 12  CMP  Ron, I don't see how that's going to work out too well. We're here - that's right in the middle of the pass that we're doing this alignment, and you've got to be darkened down from in here.

09 11 41 21  CC  Wait a minute; I think I stated that wrong. That should be 237 plus 16.

09 11 41 28  CMP  Yes, I see what you mean. Okay, Ron. But you may not get it because if we're not finished with that alignment, we're going to keep on with it.
Roger. It's just a passive TV pass anyhow.

Okay. Wait a minute. Was that the end of night period? Oh, I guess it is; my flight plan's a little low.

Yes, it was also there at CDR request.

Right; I've got it here. Yes, that'll work out.

Okay. TV pass is 237 plus 18 to 237 plus 30. At 237 plus 30, oxygen fuel cell purge.

At 238.

... Ron.

Roger. We're about LOS; I'll pick you up at the Canaries at 03.

Okay.

<CANARY (REV 144)>

Apollo 7, Houston through Canaries.

Roger. This is Apollo 7.

Roger. Loud and clear, Donn. We can continue with the flight plan update, if you're ready.

Go ahead.

Roger. Did you get the fuel cell O_2 purge at 237 plus 30?

No. I'll start there.

Roger. At 237 plus 30, oxygen fuel cell purge.

Okay. We just had one at 230.

That's affirmative. This is the one just prior to burn to make the fuel cell take more of the load.
Oh, I see. Okay.

At 238 plus 30, delete Bravo prior Huntsville and Alfa prior Guam or Guaymas.

Roger. At 239 plus 06, present GETI burn 7.

Okay. I've got a change on that - on the one I gave up to you. At 230 plus 00, delete that CRYO stratification test.

Yes. Now it looks like the heat leak is such that the heat leak into the tanks is equal to the usage out, and the pressures are remaining constant now; so you can't do one.

(Laughter) Oh, okay.

Roger. And one thing I wanted to make clear at 236 plus 50 --

Yes.

Roger. That's a backup GDC alignment, and the IMU is not to be caged. It's an alignment test.

Right. We'll leave the IMU in their zone, probably fly back to it.

Roger. A little advanced information: looks like you only have about 12 to 13 minutes to get those stars in there, and we plan to pass up some information for a local vertical attitude and kind of an AOS time at the stars.
Oh, okay, fine. That will help. Why do you say that we've only got 12 or 13 minutes?

That's the only time the stars will be in the field of view.

Oh, swell.

And they'll start going under the horizon after that time.

Oh, that's not such a hot deal, is it? This is supposed to be our backup alignment method. If we've only got 12 minutes per night pass to find them, that's kind of a difficult thing to do if you don't have help.

Roger. We understand. That's the best we can do at this setting, though.

Oh, it looks like a poor choice of stars.

I copied that.

Yes, that's interesting. I noticed during the curious night pass that the other cross was just barely above the horizon, and that was only for a few minutes, and then it started going down.

Roger.

7, Houston. We could use a kind of a crew status report there on yourself if you've got a chance.

Roger. I'm still holding up. Had a real good night's sleep - a good 8 hours, I guess - and my cold seems better; at least, I'm not blowing
my nose as much, and my ears stay clear more than a greater proportion of the time than they were earlier.

Yes, that sounds real good.

I don't know whether Wally and Walter's have improved or not; I don't think they have, to speak of. I took one Lomatil before I went to sleep. That was around - well, whenever it was that I went to sleep.

Roger.

I took it about 215 or 216.

What was that - 215 or - oh, that was the time.

Okay.

About that, 215 hours or thereabouts.

Roger.

And I haven't kept too close a track of the water; I think it's been around 20 or 30 clicks.

Roger.

A combination of before I went to sleep and then after I got up.

About 30 seconds LOS at Canaries; we've got Madrid for about 1 minute.

Roger.

It will be Redstone at 08.

Roger. Redstone at 08.
09 13 08 08 CC Apollo 7, Houston through Redstone. Standing by.
09 13 08 13 CMP Roger, Houston.
09 13 08 15 CC Roger. Loud and clear.
09 13 10 07 CMP Houston, Apollo 7.
09 13 10 09 CC Houston. Go.
09 13 10 11 CMP I looked through the optics, and I couldn't tell much in the way of dirt in there. The sextant looked clean as a whistle. There were some little light spots in the telescope which could be dirt particles catching light, you know, reflecting.
09 13 10 28 CC Roger. But you didn't see anything that looks like the command module windows?
09 13 10 33 CMP That looked like what?
09 13 10 35 CC Any of the deposits we have on the command module windows.
09 13 10 41 CMP No, I couldn't tell anything like that. You mean on the surface - the inner surface of the - next to the spacecraft, or are you looking through the whole thing?
09 13 10 49 CC Well, looking through the whole thing and also on the inner surface anywhere that you can see.
09 13 10 55 CMP No, I didn't see anything like that - that looked like our window degradation at all.
09 13 11 00 CC Roger. Copied.
They were clean as a whistle except for the little specks on the telescope which do not apparently affect the field of view when you've got the eyepiece in.

Roger. Sounds good then.

Yes, I haven't noticed any change at all in the way the stars look or the ground looks from the day we took off.

Roger.

In fact, on some of the flights, I'd like to suggest they rig up some type of a deal where you could mount a camera on there and take pictures through it. It's an excellent window for that kind of thing.

Roger.

Apollo 7, Houston.

Go ahead.

Roger. I've got about three flight planning questions here on the completion of things.

Okay. Go ahead.

Roger. Has a second sextant calibration test been performed?

No, we haven't done that.

Roger, and -

I guess the first one didn't come out too well. I mean, I only got one star.
Roger. And how about the optics calibration test? Have two of those been performed?

Don't know what that is. You mean the COAS calibration?

No, that's the first part of P23. It's that trunnion bias check thing.

Oh, yes. No, I did that the same time I did the sextant calibration.

Roger. And how about the window photography as described in the DTO S-20.16?

I haven't taken any pictures. I think Walt and Wally have taken some along the way. I don't know if we did it exactly to that DTO, but I think we got most of it.

Roger. I understand. And - 7, Houston - opposite omni.

Roger.

Apollo 7, Houston. Opposite omni again, please.

Apollo 7, Houston. One minute LOS; Antigua at 27.

Roger.

ANTIGUA (REV 145)

Apollo 7, Houston through Antigua. Standing by.

Roger.

Apollo 7, Houston. One minute LOS, Antigua; Canaries at 38.

Roger. Good morning.
09 13 36 49  CC  Good morning, and goodbye. We'll see you tomorrow, Donn.
09 13 36 54  CMP  Oh, okay, Ron. Have a good day.
09 13 36 57  CC  Roger.
09 13 36 59  CMP  Good night, or whatever it is.

CANARY (REV 145)
09 13 39 07  CC  Apollo 7, Houston through Canary. Standing by.
09 13 39 17  CMP  Roger, Bill.
09 13 43 47  CC  Apollo 7, Houston. Opposite omni, please.
09 13 46 40  CC  Apollo 7, Houston. Coming up on LOS Canaries in about one and a half minutes; approximately one more minute of calm after that if you turn your S-band volume up at Madrid.

MADRID (REV 145)
09 13 46 51  CMP  Roger.

CARNARVON (REV 145)
09 14 17 44  CC  Apollo 7, Houston through Carnarvon.
09 14 17 49  CMP  Roger, Houston.
09 14 17 51  CC  Hi, Donn. Would just like to confirm a fuel cell O₂ purge.
09 14 18 00  CMP  Roger. That is in work.
09 14 18 01  CC  Thank you. And I have a block data to pass up. This is a fairly brief pass here at Carnarvon. I'll get you at Honeysuckle at 2½ and require S-band volume up at that time.
09 14 18 19  GHP  Okay.
09 14 19 16  CMP  Bill.
09 14 19 17  CC  Roger. Go.
09 14 19 19  CMP  Could you give me a map update, please?
09 14 19 21  CC  Roger. Have one right here. For REV 146 GET
232 plus 28 plus 05, 116.8 west.
09 14 19 49  CMP  Roger. The time was 232 plus 38, was that it?
09 14 19 52  CC  Plus 28.
09 14 19 55  CMP  28. All right. Thank you.
09 14 19 56  CC  Right.

HONEYSUCKLE (REV 145)

09 14 25 31  CC  Apollo 7, Houston through Honeysuckle.
09 14 25 38  CMP  Roger, Houston.
09 14 25 40  CC  And I do have this block data ready whenever you
are ready to copy.
09 14 25 45  CMP  Okay.
09 14 26 07  CMP  Go ahead, Bill.
09 14 26 09  CC  Roger. Block data: 147 dash 1 Bravo plus 263
minus 0630 232 plus 09 plus 47 4102, 148 dash 1
Alfa plus 299 minus 0645 233 plus 46 plus 42
3550, 149 dash 1 Alfa plus 293 minus 0644 235
plus 25 plus 39 3075, 150 dash 1 Alfa plus 237
minus 0630 237 plus 07 plus 05 2811, 151 dash 1
Alfa plus 294 minus 1615 239 plus 48 plus 35 3073,
152 dash 1 Alfa plus 298 minus 1615 241 plus 29
plus 11 2839. Standing by for readback.
Roger. Can you give me that last one over, please?

The time...

Roger. 241 plus 29 plus 11.

Okay. 147 dash 1 Bravo plus 263 minus 0630 232
09 47 4102, 148 plus 299 minus 0645 233 46 42
3550, 149 plus 293 minus 0644 235 25 39 3075,
150 plus 237 minus 0630 237 07 05 2811, 151 plus
29½ plus - minus 1615 239 46 35 3073, 152 plus
298 minus 1615 241 29 11 2839.

Readback is correct.

Apollo 7, Houston. Coming up on LOS Honeysuckle;
Redstone at 43.

Roger.

REDSTONE (REV 145)

Apollo 7, Houston through Redstone. Standing by.

Roger. Houston, Apollo 7.

Roger.

Apollo 7, Houston. Opposite omni, please.

Apollo 7, Houston. One minute until LOS Red-
stone; Antigua at 02.

Roger.

ANTIGUA through BERMUD. (REV 146)

Apollo 7, Houston through Antigua.

Apollo 7, Houston.

Roger.
09 15 04 09  CC  I have a couple of things to discuss here, Donn, to put into the flight plan for flight plan update.

09 15 04 45  CMP  Oh, okay. Go ahead.

09 15 04 47  CC  Right. First item: we propose to dump waste water at 236 plus 50 - excuse me, 235 plus 50. That will be at the end of a night pass, and this will allow plenty of time for the stuff to disperse before the next night pass. And also, we'll be timed to give us the proper quantity for reentry. Now at 235 plus 50, we'd like to dump to 40 percent waste quantity, and we would like to get pretty close to that number if possible because this is going to insure us of the right quantity remaining at time for reentry.

09 15 05 44  CMP  Okay.

09 15 05 48  CC  So I gave you a wrong number there. I corrected it, but to make sure: at 235 plus 50, dump to 40 percent.

?? ?? ?? ??  SC  Roger. I've got it. At 235 plus 50, dump tape.

?? ?? ?? ??  CC  Also, second item for information, we're looking at north set stars, and the analysis now is favorable. We'll have the information soon, that is if the crew wants the information.

?? ?? ?? ??  SC  I see. We could use the north set stars if we had to do a real backup alignment.

09 15 06 27  CC  Affirmative.
09 15 06 29    OMP    All right. We'll take them if you've got them.
09 15 06 39    CC     Yes, Donn, that is correct. You could use them
                     for a backup alignment. They will be visible
                     longer, but the primary reason for looking those
                     things up was to have two stars that would be
                     visible for a longer period of time for doing
                     this test.
09 15 06 55    OMP    Oh, I see. You're saying you want to use two
                     other stars for the test.
09 15 07 01    CC     That's affirmative. We're proposing that — or
                     at least, we're prepared to provide you with
                     that information. Let me put it that way.
09 15 07 10    OMP    In coming in, are we going to end up with the
                     same — in other words when we fly back to null
                     on our GDC ball, that will be the same as when
                     we bring it up for the burn?
09 15 07 22    CC     Affirmative.
09 15 07 25    OMP    All right. Well, I don't care. It really
ds doesn't make that much difference. We're
                     trained on the south end stars.
09 15 07 35    CC     Okay. Well, I had — we had understood there was
                     some reason to be worried about those because
                     they wouldn't be visible long enough. Those two
                     stars that we have will be Nav1 and Polaris,
s stars 3 and 5. And they should — they will be
                     visible for a longer period of time. That is
                     why they went to work and got this information.
Oh, I see.

They are still looking, trying to find out exactly what the periods are for the - that is the periods of visibility and then the duration of the time they will be visible.

Yes, that may not be a problem. Actually, if you gave us the pitch, roll, and yaw align, we can just put those numbers on the IMU ball, and that ought to put the south end of the right position.

Okay. The way I understood it was that because of the geometry of the orbit and the daylight problem, they would be visible for short periods of time. However, we'll just sort of hang loose on this for right now.

Well, Ron said that they would be visible about 12 minutes. Twelve minutes would be plenty if you've got them right in the telescope to start with.

Copy.

That may not be enough.

Okay. We'll stand by. We have that information available.

Good. I prefer to use the south end stars if we can, because we trained on that a little more, and we know what we're doing, I think.
09 15 09 17  CC  Okay. Fine. Request opposite omni, please.
09 15 09 22  CMP  Okay.

CANARY (REV 146)

09 15 13 52  CC  Apollo 7, Houston. Coming up on - stand by.
09 15 15 03  CC  Apollo 7, Houston through Canary. Standing by.
09 15 16 59  CC  Apollo 7, Houston. Opposite omni, please.
09 15 22 11  CC  Apollo 7, Houston. One minute LOS Canary; volume up at 23 for 1 minute more at Madrid; Carnarvon at 50.

09 15 22 24  CMP  Houston, Apollo 7.
09 15 22 40  CC  Apollo 7, Houston. Did you read?
09 15 22 44  CMP  Roger, Bill. I got you.
09 15 22 45  CC  Okay. Thank you.

CARNARVON (REV 146)

09 15 50 10  CC  Apollo 7, Houston through Carnarvon. Standing by.
09 15 50 14  CMP  Roger. Houston, Apollo 7.
09 15 50 19  CC  Roger.
09 15 55 36  CC  Apollo 7, Houston. Opposite omni, please.
09 15 55 40  CMP  Roger.

HONEYSUCKLE (REV 146)

09 16 00 07  CC  Apollo 7, Houston through Honeysuckle. Standing by.
09 16 06 22  CC  Apollo 7, Houston. One minute LOS Honeysuckle; Texas at 32.
09 16 32 24 CC Apollo 7, Houston through Texas. Standing by.
09 16 32 29 CMP Roger, Houston.
09 16 33 09 CMP Houston, Apollo 7.
09 16 33 11 CC Apollo 7, Houston.
09 16 33 13 CMP Hey, Bill, I took a look at that south set star and those two stars, and you're right; they're not much good, but then the cross went out of sight in about oh, I guess 6 to 8 minutes.
09 16 33 30 CC Roger.
09 16 33 32 CMP So I think we better go with the north side if we can get them.
09 16 33 36 CC Okay. I'll start working on it right now.

09 16 35 23 CC Apollo 7, Houston.
09 16 35 25 CMP Roger. Co.
09 16 35 27 CC Right. On this procedure (page 33 on the checklist) - that's on this backup alignment - the two stars will be Navi, star number 3 instead of Acrux; and Polaris, number 5 instead of Atria.
09 16 35 53 CMP Okay. Stand by, and I'll get that written down here.
09 16 35 57 CC Okay. And the procedure, of course, will remain the same.
09 16 36 47 CMP Okay, Bill. I got it. The way it reads now - maneuver the stars Navi number 3 on the 50-degree mark and Polaris number 5 on the R line.
That's correct, and, of course, you have all the information written in there if we can go either way now depending upon the situation. But since you made the change, we'll assume now that we are sending all of our information up the north set stars.

Right. I'd like to do that.

Okay. Apollo 7, Houston. You're GO for 164 dash 1.

Apollo 7, Houston. One minute LOS Antigua; Canaries at 50.

Apollo 7, Houston through Canaries. Standing by.

Roger, Bill.

Houston, Apollo 7.

Apollo 7, Houston. Go.

Roger. I just got a fast alarm, and a fuel cell 3 light came on. However, all cockpit meter indications are indicating NORMAL.

Roger. We're looking.

Apollo 7, Houston.

Go.

Roger. We've been watching it for some time. The condenser exhaust temperature has been dropping.
down; there's nothing to worry about; it'll come back up as soon as you power up. Apparently, this has been a slow trend they've been monitoring from the ground.

09 16 54 13 LMP Oh, I see now. Ours has dropped below the green bank; I've got 155 here.

09 16 54 20 CC 155. Roger.

09 16 54 22 LMP Okay. We'll use batteries and compute it as usual and figure it'll come back up when we power up.

09 16 54 27 CC That's affirmative. And you still have a fuel cell 3 light?

09 16 54 30 LMP Roger.

09 16 55 35 SC Houston, Apollo 7.

09 16 55 37 CC Apollo 7, Houston.

09 16 55 40 LMP Roger. We have a number 3 that tends to run cool, and number 2 tends to run hot. Number 2 is carrying a little more load than the others that's on both bus. What do you people think of swapping; in other words, put three on both buses and two on 2 only?

09 16 55 57 CC Roger. Stand by.

09 16 56 02 CC Apollo 7, Houston. We're talking that over; we'll get it to you at Carnarvon.

09 16 56 07 LMP Roger.

09 16 57 26 CC Apollo 7, Houston. One minute LOS Canary; Carnarvon at 25. We'd like to have P00 in ACCEPT for
Carnarvon acquisition; we'll give you a state vector and a target load.

09 16 57 39 IMP Righto. I'll have it.
09 16 57 41 CC Thank you.

CARNARVON (REV 147)

09 17 25 33 CC Apollo 7, Houston through Carnarvon.
09 17 25 37 CMP Roger.
09 17 26 47 CC Apollo 7, Houston. I have the maneuver PAD when you're ready to copy.

09 17 26 56 CMP I'm ready. Go ahead.
09 17 26 57 CC Roger. SPS number 7, 239 06 1100 minus 00000 minus 01 000 minus 02020. Donn, could you go to ACCEPT, please?

09 17 27 38 CMP You've got it.
09 17 27 39 CC Roger. Continuing to read with NOUN k2: 2303 plus 0901 02083 2h6b7 minus 073 minus 131 008 05 2831 276 238 24 0000 minus 0942 plus 13557 2307; roll, pitch, and yaw all zeros. Standing by for readback.

09 17 27 59 CMP Roger. I got the SPS burn number 7, 239 06 1100 minus all balls minus 01 000 minus 02020 2303 plus 0901 02083 2h6b7 minus 073 minus 131 008 05 2831 276 238 24 0000 minus 0942 plus 13557 2307 all balls.

09 17 28 49 CC Right. You faded out. In NOUN k2 up there, for the apogee height, 2303.
Roger. 2303.

Okay. And comments: ACS AUTO with SPS, out of point north, pitched up 70 degrees. And also in the comments section, I have the backup align information.

Okay. Pitched up 70 degrees. Is that what you got?

Affirmative. Out of plane north, pitched up 70 degrees.

Right and heads up. That is a backup?

Affirmative. That's right. It is heads up.

Go ahead and give your backup angles now, Bill.

Right. For the backup alignment: roll 035, pitch 003, yaw 006. Comments: backup align stars are north set, both stars available after 5 minutes in darkness.

Okay. Roll 035, pitch 003, yaw 006, north set, 5 minutes after darkness.

Affirmative. Readback is correct.

I understand. These are the angles that when we're in position with the north set stars and we fly back to NULL on the GET, we'll also be at NULL on the INE pole.

That's affirmative. That's the way I understand it.

Okay. That ought to do it.
09 17 31 00  CC  Donn, before you put your pad away, would you
confirm in GOH 42 the C - 02083?

09 17 31 09  CMP  Roger. 02083; got it.

09 17 31 12  CC  Thank you. Readback is correct.

09 17 31 14  CMP  Okay. Thank you, Bill.

09 17 31 18  CC  Okay. Donn, it's your computer.

09 17 31 22  CMP  Okay.

09 17 31 23  CC  Both loads are in.

09 17 31 44  CC  Apollo 7, Houston. Opposite omni, please.

09 17 34 00  CC  Apollo 7, Houston. Coming up on Carnarvon LOS.
S-band volume up at Honesuckle which will be
about a half minute from now.

09 17 34 12  CMP  Okay, Bill.

HONESUCKLE (REV 147)

09 17 36 35  CC  Apollo 7, Houston. Opposite omni, please.

09 17 36 49  CC  Go.

09 17 36 56  CC  Apollo 7, Houston. Go.

09 17 37 03  CMP  Nothing, Bill. I was just responding to your
call there.

09 17 37 06  CC  I'm sorry.

09 17 37 09  CMP  No sweat.

09 17 41 44  CC  Apollo 7, Houston. Approximately 1 minute LOS
Honesuckle; Guaymas at 04.

HUNTSVILLE (REV 147)

09 18 02 18  CT  Huntsville AOS.
09 18 02 33  CC  Apollo 7, Houston through Huntsville.
09 18 03 37  CT  Huntsville LOS.

GUAYMAS through ANTIGUA (REV 147)
09 18 04 21  CC  Apollo 7, Houston through Guaymas. Standing by.
09 18 04 25  CMP  Roger.

GUAYMAS through ANTIGUA (REV 148)
09 18 13 22  CC  Apollo 7, Houston.
09 18 13 27  CMP  Go.
09 18 13 29  CC  Hey, Donn, monitor your yaw. We show a slow drift over toward 270.
09 18 13 41  CMP  Roger. I'm keeping an eye on it.
09 18 13 44  CC  Okay.
09 18 13 45  CMP  I'm hoping that the pitch and yaw ... so we don't quite get over there.
09 18 13 49  CC  Okay. We'll keep an eye on it here; we have a long pass.
09 18 13 52  CMP  Okay.
09 18 19 50  CC  Very good.
09 18 19 55  SC  Okay. Took P52 using Rigel and Aldebaran ...
                 Oh, you guys are reading this, right?
09 18 21 56  CC  Apollo 7, Houston. One minute LOS Antigua; Ascension - Canaries, rather, at 26.
09 18 22 05  LMP  Roger. Bill, we'd like to finish this fine align check.
09 18 22 12  CC  All right.
09 18 26 44 CC Apollo 7, Houston through Canary. Standing by.  
09 18 26 48 CMP Roger.  
09 18 26 52 CMP Go ahead.  
09 18 30 44 CC Apollo 7, Houston. We’re monitoring about 75 degrees in yaw.  
09 18 30 51 CMP Roger. Thanks, Bill. I just caught it. I was hoping I could get away without firing the yaw, but I had to.  
09 18 31 00 CC Roger.  
09 18 31 11 LMP Hey, Bill. We have lost downlink, and you didn’t give the tape back that last time. I did the fine align check; I used Sirius and Rigel. I got five balls starting with Eperus, got plus four balls 8, plus three balls 24, minus four balls 3 for the torquing angles in the fine align check.  
09 18 31 33 CC What were the last two on the fine align check?  
09 18 31 38 LMP Plus four balls 24 and minus four balls 3.  
09 18 31 43 CC Roger.  
09 18 33 13 CC Apollo 7, Houston. Coming up on LOS; Tanenarive at 46, and Carnarvon on the hour.  
09 18 33 22 SC Roger. We’ll see you then.  
09 18 33 25 CC Roger.  
09 19 00 53 CC Apollo 7, Houston through Carnarvon.  
09 19 00 57 CMP Hello there.
Hello. Do you have a residual from your EMS DELTA-V test?

No, haven't done it yet, but I imagine it's 21.6 like it always is.

Okay. And, Donn, just for the record, did you get the canister change?

Negative. We'll get that.

Okay. No sweat.

Good morning, Bill.

Good morning.

Hey, this is Wally. I'd like you to have the surgeon give us some dope on Actifed. We're not sure whether my symptoms with it are right or not, but my mucous thickened up and tended to dry up a little bit. It got a lot thicker as a result of treating myself with Actifed. Does it dry up the nostrils and the sinus, or does it just sort of thicken it up?

Stand by. The surgeon is nodding his head and said that's a common response.

That it thickens the mucous?

It thickens it and also maybe dries up your nose.

How about your sinuses? Will it dry up your sinus?

It shrinks them down.

Does, eh?
Roger.

Well, let's make our point. We're about ready to start on Actifed about every 8 hours, right up to retro, and we're just not sure if it's a smart move or not.

It - as far as the surgeon is concerned, it's a recommended procedure.

Roger. We'll go that way.

Okay.

Hey, Bill.

Roger.

We've tried and tried since last night to find out how we're going to change canisters 22 times, when we only started with 22 canisters including the two in the lithium hydroxide canister.

Okay. I had originally designed that thing; I'll explain it to you later.

Well, for change number 21, we can put can number 1 back; but for 22, it leaves me cold.

Okay.

I think we'd better go back to the drawing boards for that one, Bill.

No comment.

Our point here, Bill, is maybe we had better not change this one now. If we just stretch these out - none of them have gone very far - we're
less than about one-tenth of a millimeter right now. If we stretch this one out and move the next one back a little bit, we've got them through the flight, I think.

09 19 05 39 CC Roger. I see what you're saying. I agree.
09 19 05 42 CDR What he's saying - in 101, we should at least try for a silly millimeter longer.
09 19 05 46 CC Oh, boy.
09 19 05 50 LMP That's two for you.
09 19 05 52 CMP Bill, I told you to get us a new writer.
09 19 06 02 CC Thought you were setting me up there the other night. I'm afraid to say anything anymore.
09 19 06 07 SC (Laughing) Yes.
09 19 08 08 LMP Hey, Bill. Happiness is a package of bacon squares on day 10.
09 19 08 13 CC Roger. Sounds like you have quite a few useful comments on the food there; I've been reading the notes.
09 19 08 23 CMP You ought to see what we've written.
09 19 08 26 CDR How do they spell "blach"?
09 19 08 35 CC Check with Sparkey Schultz, there.
09 19 08 51 CC We think you ought to look that one up in your Funk and Wagnalls.
09 19 08 59 LMP We'll bridge the gap.
09 19 09 30 CC Apollo 7, Houston. LOS Carnarvon in 1 minute; S-band volume up at that time for Honeysuckle.
HONEY SUCKLE (REV 148)

09 19 09 37 CDR Okeydoke.

09 19 12 02 CC Apollo 7, Houston. Opposite omni, please.

09 19 12 43 CC Apollo 7, Houston. Opposite omni again, please.

09 19 12 59 CDR Houston, did you call S-band?

09 19 13 01 CC Roger. Opposite omni.

09 19 13 03 CDR Roger.

09 19 17 13 CC Apollo 7, Houston. Coming up on Honeysuckle LOS; Hawaii at 29.

HAWAII through BERMUDA (REV 148)

09 19 30 59 CC Apollo 7, Houston through Hawaii. Standing by.

09 19 31 03 SC Aloha.

09 19 37 41 CC Apollo 7, Houston.

09 19 37 48 SC Roger. Go.

09 19 37 50 CC Right. Just by way of a reminder, we'd like to remind you that when in DAP control, we'd like all channels ENABLED, and DAP loaded to fail quads Alfa and Bravo to save some fuel on these two quads.

09 19 36 15 CAP I understand that about the DAP load. What did you say before the DAP load?

09 19 36 22 CC Just as a reminder.

09 19 36 26 CAP Okay. If it was only the DAP load, we are aware. Thank you very much.

09 19 36 29 CC Right. Thank you.
09 19 38 32 LMP It is our intention not to change - make canister change 22 in the flight plan until about 40 hours, unless $CO_2$ partial pressure dictates otherwise.

09 19 38 44 CC Roger.

09 19 39 20 LMP Houston, Apollo 7.

09 19 39 22 CC Apollo 7, Houston. Go.

09 19 39 24 LMP Roger. You're coming in a lot better now. It's our intention not to make canister change number 22 as called out in the flight plan until about 40 hours.

09 19 39 33 CC Roger. Understand.

09 19 39 34 LMP And that - unless $CO_2$ partial pressure goes up, we'll make canister change number - I guess it's 23. We will make 21 at about 40 hours. We'll make canister change 22 at about 50 hours. And we will put canister number 1 back in - canister number 2 back in then.

09 19 39 51 CC Okay. I understand. That's okay.

09 19 39 55 LMP We'll put the canister back in that we took out first, whatever it was.

09 19 39 59 CC Right. I understand what you're saying.

09 19 40 18 CMP Houston, Apollo 7.

09 19 41 20 CC Apollo 7, Houston. Go.

09 19 41 22 CMP Roger. We're in the process of doing this backup alignment. I've got as far as getting the stars where they should be and aligning the GDC. We're
now flying back to three zeros on the ball. Let's check our error against the IMU.

Roger.

Houston, Apollo 7.

Apollo 7, Houston.

I'd like to record a comment concerning the optics quality of the telescope.

Roger.

We focus very sharply on the reticle pattern and stars and so forth in the center of the telescope. As you get out toward the edge of it, the fringe area, it gets a distortion, and you get some fuzziness; this makes it very difficult to pick up stars out on the edge of it. Reminds me of a cheap pair of binoculars that you might get at Sears on sale or something.

Roger.

HAWAII through BERMUDA (REV 149)

Apollo 7, Houston.

Are you — you're getting our DSKY on the down-link, are you?

Affirmative.

Okay. Those numbers you see are the errors in this procedure. Looks pretty good to me.

You can't argue with that.
09 19 46 21  CDR  Let's argue. To make the point a little plainer, the attitude set thumbwheels are also included in this summation of errors because all I did was set in nine balls to fly the GDC error needle to NULL. So the bias from that is also included.

09 19 46 38  CC  I understand.
09 19 46 39  CDR  Roger.
09 19 49 14  OMP  Hey, Bill, do you have a map update for us? One that's on this rev, say?
09 19 49 19  CC  Stand by. We have REV 149, time is 236 plus 58 plus 45, 173.9 degrees east.
09 19 49 48  LMP  Roger.
09 19 50 38  CC  Apollo 7, Houston. Also like to remind you about the waste water dump scheduled at 235 plus 50.
09 19 50 48  LMP  Wilco.
09 19 52 52  LMP  Houston, Apollo 7.
09 19 52 53  CC  Apollo 7, Houston. Go.
09 19 52 55  LMP  We show water dump down to 40 percent. I assume that 40 percent guarantees us we won't have to dump anymore before reentry. We can restow our attachment? Over.
09 19 53 08  CC  Okay. That is using the figures they have been able to determine on the flight; that's correct.
09 19 53 17  LMP  And we'll end up with how much of the waste water tank then at 250 hours?
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 19 53 21</td>
<td>CC</td>
<td>About 90 percent.</td>
</tr>
<tr>
<td>09 19 53 23</td>
<td>LMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>09 19 53 25</td>
<td>CC</td>
<td>You got a little --</td>
</tr>
<tr>
<td>09 19 53 26</td>
<td>LMP</td>
<td>We're going to restow this thing. This is going to be our last dump.</td>
</tr>
<tr>
<td>09 19 53 29</td>
<td>LMP</td>
<td>What if we go an extra 3 hours, what would happen?</td>
</tr>
<tr>
<td>09 19 53 34</td>
<td>CC</td>
<td>Stand by.</td>
</tr>
<tr>
<td>09 19 53 38</td>
<td>LMP</td>
<td>We won't worry about that.</td>
</tr>
<tr>
<td>09 19 53 39</td>
<td>CDR</td>
<td>This is kind of academic; we're worried about a trickle flow through the urine dump, that's all.</td>
</tr>
<tr>
<td>09 19 53 44</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>09 19 53 45</td>
<td>CDR</td>
<td>So we're not worried. We'll make this dump, and that's it.</td>
</tr>
<tr>
<td>09 19 53 48</td>
<td>CC</td>
<td>All right.</td>
</tr>
<tr>
<td>09 19 56 32</td>
<td>LMP</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>09 19 56 34</td>
<td>CC</td>
<td>Apollo 7, Houston. Go.</td>
</tr>
<tr>
<td>09 19 56 36</td>
<td>LMP</td>
<td>Through with downlink now. Do you show the cabin pressure holding steady? We've got an O₂ FLOW HI on, and I think it looks to me like the cabin pressure might be falling a little bit.</td>
</tr>
<tr>
<td>09 19 56 47</td>
<td>CC</td>
<td>Cabin pressure's holding pretty constant here. I've been looking at it, but stand by.</td>
</tr>
<tr>
<td>09 19 57 14</td>
<td>CC</td>
<td>Apollo 7, Houston. No, it still looks good here; you might check the waste vent and direct O₂ valves.</td>
</tr>
<tr>
<td>09 19 57 22</td>
<td>LMP</td>
<td>Roger. We are dumping water.</td>
</tr>
</tbody>
</table>
09 19 57 25 CC Oh, yes. That's probably it. I'm reading about 46.8 percent now.
09 19 57 33 LMP Roger.
09 19 57 35 CDR Are you seeing rates down there, Bill?
09 19 57 37 CC I can see quantities; I'm getting readouts.
09 19 57 40 CDR No, no maneuvering rates.
09 19 57 44 CC Looks like I just lost - I lost part of my display here, but I was watching them, yes.
09 19 57 49 CDR We're building up to almost two-tenths of a degree in percent already in yaw since the dump.
09 19 57 55 CC Yes, I see it.
09 19 57 56 CDR Okay. Let's take it out now.
09 19 57 57 CC One-tenth of a degree in the other two axes.
09 19 57 59 CDR Roger.
09 19 58 05 SC ... two-tenths of a degree per second.
09 19 58 11 CC Okay. I'm making a comment.
09 19 58 39 CC Apollo 7, Houston. Coming up on LOS; Tananarive at 21.
09 20 23 17 CC Apollo 7, Houston through Tananarive. Standing by.
09 20 23 26 CC Good morning, Donn.
09 20 23 27 CMP Hi, Jack. How are you?
09 20 23 29 CC Fine.
09 20 23 30 CMP Good.
09 20 28 09 CC Apollo 7, Houston. One minute LOS Tananarive; Carnarvon at 35.
09 20 38 12  CC  Apollo 7, Houston through Carnarvon. Standing by.
09 20 38 17  CMP  Roger.
09 20 39 37  CC  Apollo 7, opposite omni.
09 20 39 49  LMP  Tell Ed I admire his astute judgement.
09 20 39 56  CC  Roger.

09 20 44 54  CC  Apollo 7, opposite omni.
09 20 44 58  CMP  Roger.
09 20 45 54  CC  Apollo 7, Houston.
09 20 45 57  CDR  Go ahead.
09 20 45 59  CC  Okay. Wally, as we go over the hill here, we are looking at the primary evaporator; looks a little strange. If it dries out, you might shut it down and leave it shut down; we'll pick you up next time. We are about 45 seconds LOS here at Carnarvon. We do have Honeysuckle for another 4 minutes if you want to turn up S-band.
09 20 46 22  CDR  Wilco.
09 20 46 23  LMP  We'll go ahead and shut it down, Jack.
09 20 46 25  CC  Okay. Does it look strange to you, Walt?
09 20 46 27  LMP  Yes. I'm going to shut it down.
09 20 46 28  CC  Okay. We do not have Honeysuckle, so we'll pick you up at Hawaii at 02.

09 21 02 58  CC  Apollo 7, Houston through Hawaii.
Roger.

Houston, Apollo 7.

Go ahead.

Roger.

Houston, Apollo 7.

Go ahead, 7.

Jack, I've got one more helpful hint to offer on this backup alignment.

Okay. Go ahead.

Okay. In order to prevent the optics from dripping off the shaft and trunnion angle, you set merely turn optics power off when you get it set up, and they will stay right there.

Okay.

I think the point to make note of is that we are really tracing out what amounts to an optics shaft tieup anyway. You could consider it just that way.

Okay. Copy that, Walt.

Hey, Jack, on the primary evaporator here, I went to MANUAL and increased for a minute, and it really didn't do much; then it started coming back up. I went to AUTO again, when I noticed the setting in here with the evaporator outlet temperature about midrange and the steam pressure in an acceptable spot. And I don't see either one of them moving at all now.
09 21 08 32  CC  Okay. Copy that.
09 21 08 34  SC  So I am going to start looking for a separate
                problem on that.
09 21 08 37  CC  All right.
09 21 09 51  CC  Apollo 7, Houston.
09 21 09 54  CDR  Go.
09 21 09 55  CC  Okay. Wally, on the primary evaporator there,
                the pressures and temperatures look normal to
                us down here on the ground. We would like to
                shut the evaporator down at this time; and some
                time after the burn, we will reservice it again
                and then use it prior to entry.

                HAWAII (REV 150)

09 21 10 13  CDR  Okay. You don’t want to reservice it when I
                shut down?
09 21 10 16  CC  Negative.
09 21 10 17  CDR  And what are you showing glycol EVAP OUT temp-
                erature?
09 21 10 22  CC  44.1.
09 21 10 24  CDR  Yes. Well, when this is controlling, it controls
                down around 40.
09 21 10 35  CC  Wally, it shouldn’t be boiling now. You RAD OUT
                slow, and it’s - you are mixing.
09 21 10 37  CDR  Understand.
09 21 11 02  CDR  If you will notice, Jack, I don’t have manual
                control of the steam pressure valve.
You have gone to INCREASE now?

I went to INCREASE for about a minute and a half when I shut it out earlier, with no noticeable effect on the back pressure - the steam pressure. Subsequent to that time, it came up. When it got within a working range, I went back to AUTO. I just attempted to manipulate it again, with no noticeable effect on it. That's why I think there is something fishy with the back pressure control. It is secure now as much as I can secure it, and if we just let it sit here, it might end up drifting on up like it did before. I won't reservice it until some time before reentry then.

Okay. We will give you a cue.

Houston, Apollo 7.

Go ahead. Go ahead, Wally.

Roger. We are starting with ALC out; we are dark in here with floods on. Is that correct?

For even light, if you are going to show pictures of the panel or something like that, you should put ALC in. For spot effects, then ALC should be out.

We have got floods around us here that are pretty bright. We will try out first, all right?

Okay. That is fine, and if it does not look like a real good picture, I'll tell you to change the position of the switch.
09 21 17 27 CDR Very good.
09 21 17 31 CC Have you got a spectacular for us this morning?
09 21 17 33 CDR Negative.
09 21 17 34 CC Okay.
09 21 17 36 CDR We are just going to be at our duty stations.
09 21 17 38 CC All right.
09 21 18 58 CC Okay. We are just starting to pick it up, Wally. The picture is not real clear yet. Okay. There, it's coming in. From the lovely Apollo room high stop everything - you might try a different position on the ALC switch. Let's see how that helps.
09 21 19 35 LMP How is that, Jack?
09 21 19 37 CC Okay. Let's go back to the other position; I think you were right. Everybody out of the pool.
09 21 19 56 SC This morning, we are at our regular crew stations passing over the United States about an hour and a half before our seventh and final burn, before our eighth burn tomorrow morning on retro fire. Donn Eisele is down in the lower equipment bay on a backup alignment technique. We had the platform aligned at this point before burn number 7. I don't know whether you can note or not, Jack, but I'm moving from the front of the attitude indicator down below up to the window, getting ready to check for dawn. It should be arriving just any moment now. I think you can
see the ease in motion. None of us are strapped in; we feel very comfortable where we are.

Roger. It's coming in very clear.

Roger. We thought we would try to give each of you a closer look at our beards this morning, to prove that we have been here, and we are not fans of the beard club. I will not admit to the fact that there is any grey in this beard. My hairdresser is the only one that knows.

KAWAII through ANTIGUA (REV 150)

Roger. We can't see the grey; you're safe.

Roger. I was wondering where the grey went. Well, I'm going down below now and let Donn get up on the couch; you can check his beard and his configuration for the day.

Hey, Donn, you want to move over to your - oh, that's it.

Wally's going to move the camera a little bit. You have three professional cameramen up here now; so when we get back, we expect to get our union cards. I was performing a backup alignment procedure that could be used in the event of a computer failure to get the inertial platform aligned for a particular maneuver. That has been completed now. That was one of our test objectives on this flight, and it came out
very good. We came within a quarter of a degree of the actual alignment that we wanted. Wally and I have been taking turns watching the eight balls over here keeping the spacecraft somewhere near the attitude we need for the burn, and a little later on we will bring it in precisely. Our number 1 cameraman is now coming down to dolly up on Walt Cunningham and his beard.

Wally, there appears to be a few pieces of lint on the lens. Thank you.

Now, we would like to give you another demonstration. ... that we've noticed right about this time is the little bit of atmospheric pressure causing the spacecraft to move at this altitude, as we near the perigee, and that's what Donn's looking at on the dial right now. ..., Walt, why don't you tell them where you are now, and point the camera over your head.

Okay. We are just about due for an O₂ purge. Because of the time, I'm going to go ahead and start the O₂ purge in fuel cell 1. We have three fuel cells that have been running very nicely for 11 days. I've got a camera sticking in the window here, a 16mm Maurer camera, which we have been taking strip photographs for the ground at various times, and we are presently going to stow
that. We're trying to get the cockpit clean for
the burn, which is due here in a couple of hours.
We keep behind our couch here, a large bag which
we call a temporary stowage bag. In order to pre-
clude having to take items all the way down to
where we originally got them, during the flight,
we drop them in the temporary stowage bag, such as
your meals, and like the camera was just done now.
A rather interesting phenomena we're noting out the
window, it's light now. It's very hard to tell on
camera in that the details are very fine. We see
about three or four different contrails from air-
craft flying at high altitude, but obviously not
as high as we. They show up very neatly, some
people call contrails, vapor tail; they extend for
hundreds of miles.
I remember the one we saw, was it yesterday or the
day before, over Africa, Wally.
Right. Now, we've got an interesting one below
us over the Gulf Coast.
And as you look out the window towards the horizon,
you can get a good view of the day airglow. There
is a very interesting band of color that runs between
the actual earth surface and up where the dark blue
or black of the sky begins. It's a very pretty,
very toned blue color.
I'm now going to pan back one last time across the cockpit here, and I guess this will end our weekly series with this broadcast. There is our navigator.

Navigator here.

The view this morning is very fascinating; we're looking all over the Gulf Coast area and looking now at Lake Ponchartrain. We can see the bridge standing out very clearly. There's a slight cyclonic disturbance in the cloud structure, which is probably the very bitter end of our friend Gladys. I hope our friends in Florida where we left some time ago, have not suffered too much with Gladys.

We have one more sign for you to close out our weekly series, and we plan to drop in tomorrow and see how everybody held out.

Could you move it a little closer? Let's see, Donn, you want to help him out there. "As the sun sinks slowly in the west."

This is Apollo 7, cutting out now.

A very good one, Wally.

Time for a commercial.

We got a good look at the last bit of Gladys just off the coast.

Boger.

Looks like it still might be dumping a little rain on the Cape.
On - Gladys is - looks like -. About north of Jacks-

Isn't it just about off the coast of Jacksonville?

No, Wally, Gladys is up around 40, 40 degrees north.

On, it is? We're seeing the tail end of it, I'm sure.

Well, it looks like about, 67 degrees west, and 40 degrees north. That was the position at 0400 Zebra this morning.

Roger. How is the weather in 164 dash one area?

Weather is real good there.

Well, I think we are just about getting warmed up to the ... In that case, I've got a feeling today that when we come over 164-1 - our splash point that is - that we won't use the word impact.

Okay, Wally, I'll give you a kind of a hack when you pass close to us here, so you can take a look at it.

Roger. Are we working it now, or is it the next rev?

No, the next rev. It will be way north of you. In just a few minutes, I'll give you a hack and it will be slightly north of you, of your present position.

Okay. We'll try and give you a weather report.

I'm not really worried too much about the weather, as long as the ocean is nice and smooth.
09 21 29 57 CC Understand.
09 21 29 58 CDR What we are facing up to is this is a great spacecraft, but we know it's a lousy boat.
09 21 30 16 CC Okay. Wally, you are about 65 degrees west now, and your latitude looks like about 24 degrees north, and so that would put 164 dash 1 about 240 miles north of you now.
09 21 30 30 CDR Roger. Walt will give you a report, he's looking that way.
09 21 30 34 IMP As near as I can see, there is nothing but very widely scattered cumulus to the left for one-tenth coverage this way.
09 21 30 40 CC Thank you.
09 21 30 54 CDR Do those signs come through fairly clear to you, Jack?
09 21 30 58 CC They do when you get close to the camera; it was pretty clear today.
09 21 31 04 IMP What did you think of those beards?
09 21 31 09 CC Well, they are there. We can't tell whether they are 3 inches long or a half inch long.
09 21 31 17 CDR I'd say about 101 mm.
09 21 31 22 IMP Hey, Jack, note that the steam pressure is very slowly creeping up here, and that's long after I quit operating it. We may have a sticky valve back there.
09 21 31 33 CC Okay. It looks fairly normal to us. It looks like it might have been a little bit dry.
09 21 33 06 CC Houston, Apollo 7.
09 21 33 08 CDR Go ahead, 7.
09 21 33 10 CDR Roger. One of the interesting things we've noted; I don't think we have brought it to your attention here. If you recall going to a monkey cage and watching monkeys grab bars, the monkeys always grab the same place. We found ourselves in the same condition here; using our hands and feet to maneuver about, and we always hit the same traffic spot.
09 21 33 30 CC Roger.
09 21 33 33 CDR We've become very acclimated to this.
09 21 33 38 CMP I think he's trying to tell you we've gone ape.
09 21 33 43 CC I think we guessed that.
09 21 34 05 CDR We're getting to the point where we get free rides with this perigee kick, we're just about ... attitude again. It's going to be kind of tight in this burn; it is right at perigee and out of plane.
09 21 34 16 CC Yes, that's right, Wally.
09 21 34 18 CDR I think that's probably the biggest surprise in the whole mission was the effects of this perigee torque. If you buck it, it can cost you dearly in fuel.
09 21 34 32 CC I guess it's kind of like the old aileron roll on the 86.
09 21 34 36 CDR Very good. It's about that kind of surprise, too.
09 21 34 59 CC 7, could we get your up-telemetry COMMAND RESET then NORMAL?
<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 21 42 31</td>
<td>CC</td>
<td>Apollo 7, Houston through Ascension. Standing by.</td>
</tr>
<tr>
<td>09 21 43 27</td>
<td>CC</td>
<td>Roger. Copy. We're standing by.</td>
</tr>
<tr>
<td>09 21 44 49</td>
<td>CDR</td>
<td>Houston, Apollo 7.</td>
</tr>
<tr>
<td>09 21 44 51</td>
<td>CC</td>
<td>Go ahead, 7.</td>
</tr>
<tr>
<td>09 21 44 53</td>
<td>CMP</td>
<td>Roger. What's the sunset time?</td>
</tr>
<tr>
<td>09 21 45 12</td>
<td>CC</td>
<td>Donn, the next one coming up is 238 plus 12.</td>
</tr>
<tr>
<td>09 21 45 18</td>
<td>CMP</td>
<td>All right. Thank you.</td>
</tr>
<tr>
<td>09 21 47 44</td>
<td>CC</td>
<td>Apollo 7, you're 1 minute LOS Ascension; Tananarive in 57.</td>
</tr>
<tr>
<td>09 21 47 52</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>09 21 59 54</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive.</td>
</tr>
<tr>
<td>09 21 59 57</td>
<td>IMP</td>
<td>Roger. Jack, fuel cell 2 seems to be a little more temperamental today than it has been in the last 3 or 4 days. We're going a little faster and a little higher. The... indicates that the next hour and 6 minutes, we will state our activity.</td>
</tr>
<tr>
<td>09 22 00 19</td>
<td>CC</td>
<td>Okay. Wait, you're about three-by here at Tananarive. Copy fuel cell 2 being a little more temperamental today than previously.</td>
</tr>
<tr>
<td>09 22 12 04</td>
<td>CC</td>
<td>Houston through Carnarvon. Standing by.</td>
</tr>
<tr>
<td>09 22 12 09</td>
<td>CDR</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>09 22 12 11</td>
<td>CC</td>
<td>You, also.</td>
</tr>
<tr>
<td>09 22 21 52</td>
<td>CC</td>
<td>Apollo 7, we are about 1 minute LOS Carnarvon; we'll pick up Guam at 25.</td>
</tr>
</tbody>
</table>
Roger. Jack, on our RMS bias test for the 30-second count into the burn, and the duration of the burn it went 0.1 foot per second.

Roger. Copy that.

Seems that way.

GUAM (REV 150)

Apollo 7, Houston through Guam.

Roger. Loud and clear here.

Loud and clear.

Jack, would you reconfirm our DELTA-V as 208 feet per second? The reason I ask, the DSKY came up with a total velocity of 225, and that's quite a difference.

Roger. We have 208.3 on the DELTA-V counter.

Roger. I got that. I just wanted to make sure I was right.

Do you have to downlink, Jack?

Affirmative, Walt.

Donn, we are allowing about 17 feet a second for tail-off here on this burn.

I see; we are getting more than I thought we would.

Roger. That was a change we made into the tail-off into the computer.

Yes.

7, we are 1 minute LOS Guam; we pick up Hawaii at 38.
<table>
<thead>
<tr>
<th>Time</th>
<th>Actor</th>
<th>Role</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 22 32 41</td>
<td>LMP</td>
<td></td>
<td>Downlink yet?</td>
</tr>
<tr>
<td>09 22 32 44</td>
<td>CC</td>
<td></td>
<td>Negative; we have lost downlink; we'll get it again at Hawaii.</td>
</tr>
<tr>
<td>09 22 32 50</td>
<td>CMP</td>
<td></td>
<td>Star check: that's 283.14, 276.99 is the shaft and trunnion to be right on the star.</td>
</tr>
<tr>
<td>09 22 32 57</td>
<td>CC</td>
<td></td>
<td>Okay.</td>
</tr>
<tr>
<td>09 22 33 02</td>
<td>CC</td>
<td></td>
<td>Could you say again the trunnion, Donn?</td>
</tr>
<tr>
<td>09 22 33 05</td>
<td>CMP</td>
<td></td>
<td>Trunnion 276.99.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>HAWAII through ANTIGUA (REV 150)</td>
</tr>
<tr>
<td>09 22 39 01</td>
<td>CC</td>
<td></td>
<td>Apollo 7, Houston through Hawaii.</td>
</tr>
<tr>
<td>09 22 39 28</td>
<td>CC</td>
<td></td>
<td>Apollo 7, Houston.</td>
</tr>
<tr>
<td>09 22 39 33</td>
<td>CDR</td>
<td></td>
<td>Go ahead.</td>
</tr>
<tr>
<td>09 22 39 34</td>
<td>CC</td>
<td></td>
<td>Roger. We'd like your O2 tank 1 fans OFF now to prevent an AUTO cycling during this burn.</td>
</tr>
<tr>
<td>09 22 39 44</td>
<td>LMP</td>
<td></td>
<td>It's OFF.</td>
</tr>
<tr>
<td>09 22 55 43</td>
<td>CC</td>
<td></td>
<td>7, I'll give you a time hack in 10 minutes.</td>
</tr>
<tr>
<td>09 22 55 46</td>
<td>LMP</td>
<td></td>
<td>Okay, Jack.</td>
</tr>
<tr>
<td>09 22 56 05</td>
<td>CC</td>
<td></td>
<td>Five, four, three, two, one.</td>
</tr>
<tr>
<td>09 22 56 10</td>
<td>CC</td>
<td></td>
<td>MARK.</td>
</tr>
<tr>
<td>09 22 56 11</td>
<td>LMP</td>
<td></td>
<td>Looks like we are about one-half second off.</td>
</tr>
<tr>
<td>09 22 56 13</td>
<td>CC</td>
<td></td>
<td>I will also give you one in 2 minutes.</td>
</tr>
<tr>
<td>09 22 56 15</td>
<td>LMP</td>
<td></td>
<td>Okay.</td>
</tr>
<tr>
<td>09 22 57 51</td>
<td>CDR</td>
<td></td>
<td>You got a lot of smoke right off Galveston down there.</td>
</tr>
<tr>
<td>09 22 57 54</td>
<td>CC</td>
<td></td>
<td>Roger. Copy.</td>
</tr>
<tr>
<td>09 22 57 56</td>
<td>CDR</td>
<td></td>
<td>Looks pretty bad.</td>
</tr>
</tbody>
</table>
09 23 01 04 CMP Number 1 is closed.
09 23 01 07 CMP Direct OFF.
09 23 01 09 CDR One roll channel.
09 23 01 10 CMP One roll channel P, and B is OFF.
09 23 01 16 CDR TVC gimbal drive, pitch and yaw, AUTO.
09 23 01 21 CMP TVC gimbal drive, pitch and yaw, AUTO.
09 23 01 24 CDR TVC servo power 1 and 2, AC 1 and AC 2.
09 23 01 38 CDR TVC servo power 1 and 2.
09 23 01 40 CMP Roger. Servo power ON.
09 23 01 42 CDR Okay. Handcontroller power 1.
09 23 01 46 CMP One.
09 23 01 47 CDR Hand controller 2 ARMED.
09 23 01 50 CMP That's Roger. It is ARMED.
09 23 02 03 CDR Okay. Bus ties ON, gimbal motors pitch 1. Start.
09 23 02 07 CMP Pitch 1 was a start.
09 23 02 12 CDR Pitch 2 or yaw 1 start.
09 23 02 14 CMP Yaw 1, start.
09 23 02 17 CDR OFF-ON.
09 23 02 18 CDR Reconfirm trim control.
09 23 02 31 CMP Roger. Got trim control. Trim is set.
09 23 02 33 CDR Very well; translation clockwise.
09 23 02 37 CMP Translation clockwise.
09 23 02 38 CDR Verifying no MTVC.
09 23 02 44 CMP No MTVC.
09 23 02 45 CDR Okay. Pitch 2 and yaw 2 ON.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 23 02 48</td>
<td>CMP</td>
<td>ON</td>
</tr>
<tr>
<td>09 23 02 50</td>
<td>CDR</td>
<td>Yaw coming ON.</td>
</tr>
<tr>
<td>09 23 02 51</td>
<td>CMP</td>
<td>ON</td>
</tr>
<tr>
<td>09 23 02 53</td>
<td>CDR</td>
<td>Confirm and set GPI.</td>
</tr>
<tr>
<td>09 23 02 56</td>
<td>CMP</td>
<td>Roger</td>
</tr>
<tr>
<td>09 23 02 57</td>
<td>CDR</td>
<td>Verify</td>
</tr>
<tr>
<td>09 23 03 02</td>
<td>CDR</td>
<td>Verify MVC.</td>
</tr>
<tr>
<td>09 23 03 03</td>
<td>CMP</td>
<td>Roger</td>
</tr>
<tr>
<td>09 23 03 08</td>
<td>CDR</td>
<td>... verify</td>
</tr>
<tr>
<td>09 23 03 09</td>
<td>CDR</td>
<td>Translation neutral</td>
</tr>
<tr>
<td>09 23 03 12</td>
<td>CMP</td>
<td>Neutral</td>
</tr>
<tr>
<td>09 23 03 13</td>
<td>CDR</td>
<td>Handcontroller power, BOTH</td>
</tr>
<tr>
<td>09 23 03 15</td>
<td>CMP</td>
<td>Handcontroller power, BOTH</td>
</tr>
<tr>
<td>09 23 03 17</td>
<td>CDR</td>
<td>Roger</td>
</tr>
<tr>
<td>09 23 03 19</td>
<td>CDR</td>
<td>BMAG uncaged.</td>
</tr>
<tr>
<td>09 23 03 23</td>
<td>CMP</td>
<td>BMAG - negative; not caged, I mean. I meant to say they are ATT-1/RATE 2.</td>
</tr>
<tr>
<td>09 23 03 31</td>
<td>CDR</td>
<td>Roger. That's where it should be.</td>
</tr>
<tr>
<td>09 23 03 32</td>
<td>CMP</td>
<td>Right</td>
</tr>
<tr>
<td>09 23 03 38</td>
<td>CDR</td>
<td>Okay. Direct RCS ON.</td>
</tr>
<tr>
<td>09 23 03 41</td>
<td>CMP</td>
<td>Direct RCS ON.</td>
</tr>
<tr>
<td>09 23 03 49</td>
<td>CDR</td>
<td>Verify manual attitude - RATE COMMAND.</td>
</tr>
<tr>
<td>09 23 03 52</td>
<td>CMP</td>
<td>Roger. RATE COMMAND in deadband.</td>
</tr>
<tr>
<td>09 23 03 55</td>
<td>CDR</td>
<td>Then you are in ATT-1/RATE 2.</td>
</tr>
<tr>
<td>09 23 03 57</td>
<td>CMP</td>
<td>... same way. Copy with it.</td>
</tr>
<tr>
<td>09 23 04 02</td>
<td>CC</td>
<td>Okay. I'll give you a mark at 2 minutes. Five, four, three, two, one.</td>
</tr>
</tbody>
</table>
09 23 04 11  CC  MARK.
09 23 04 12  CC  T minus 2 minutes.
09 23 04 40  CC  Apollo 7, verify omni Bravo.
09 23 04 59  CC  Apollo 7, Houston.
09 23 05 01  CHP  Go.
09 23 05 02  CC  Roger. Verify omni Bravo.
09 23 05 05  CHP  That's affirm.
09 23 05 06  CC  Okay.
09 23 05 11  CDR  We're locking up now.
09 23 05 13  CC  Roger.
09 23 05 42  CDR  We missed DELTA-V AUTO.
09 23 05 44  CHP  EMS DELTA-V AUTO.
09 23 05 53  CDR  It's 15.
09 23 06 02  CC  Nine, eight, seven, six, five, four, three, two, one.
09 23 06 11  CC  Zero.
09 23 06 30  CDR  Go ahead. GPI's are gimbal, OFF.
09 23 06 35  CHP  Gimbal motors OFF.
09 23 06 39  CDR  Bus ties OFF.
09 23 06 41  CHP  DELTA-V thrust, OFF-ON.
09 23 06 42  CDR  Gimbal motors circuit breakers OPEN.
09 23 06 43  CHP  Roger.
09 23 06 50  CHP  VF downlink.
09 23 06 53  CC  Affirm.
09 23 06 57  CDR  TVC servo power 1 and 2 OFF.
09 23 07 03  CHP  TVC servo power OFF.
09 23 07 04  CDR  Direct RC is OFF.
09 23 07 06  CMP  Direct RC is OFF.
09 23 07 12  CDR  Handcontrollers locked.
09 23 07 17  CMP  Both handcontrollers are locked.
09 23 07 32  CMP  EMS residual is minus 17.9.
09 23 07 38  CC  Copy that.
09 23 07 40  CMP  That's pretty good.
09 23 07 47  CMP  Stand by.
09 23 08 34  CDR  Hey, Jack.
09 23 08 35  CMP  Houston, Apollo 7.
09 23 08 36  CC  Go ahead.
09 23 08 37  CMP  Did you get us an RCS quantity readout as of this minute?
09 23 08 41  CC  Okay. Donp, I am going to be coming to you over Ascension with the chart readout as well as the flight plan update.
09 23 08 50  CMP  Roger. Understand.
09 23 08 51  CDR  Hey, Jack, I would like to go ahead and open circuit fuel cell 2 and save it for the burn tomorrow.
09 23 09 03  CC  We show that $T_{CE}$ is coming down now, Wally. We are reading 190.
09 23 09 08  CDR  I show 192. It peaked out at what, about 195?
09 23 09 12  CC  No, we showed 192 on the TM here.
09 23 09 17  CDR  That's just before the burn. Looked like it was about 195 on my meter, and you want to go ahead and let it run with this?
09 23 09 23 CC Yes, we will let it run right now. We will see you over at Ascension. We've got about 1 minute LOS here.

09 23 09 28 CDR Okay.

09 23 09 29 CC We will pick you up at 17 at Ascension. We will have a flight plan update for you there.

ASCENSION (REV 151)

09 23 17 25 CC Apollo 7, Houston through Ascension.

09 23 17 46 CC Apollo 7, Houston through Ascension.

09 23 18 12 CC Apollo 7, Houston through Ascension.

09 23 18 16 CDR Loud and clear, Jack.

09 23 18 17 CC Okay. That burn looked pretty good down here; how did it go up there?

09 23 18 21 CDR Right on the mark. It's a beauty.

09 23 18 25 CC It looked the same way down here. I have this flight plan update to go over with you.

09 23 18 33 CDR Okay. We will discuss it.

09 23 18 38 CC Okay. Are you ready to copy this material in the book here? They're mostly deletions.

09 23 18 43 LMP Will copy.

09 23 18 44 CC Okay. They are mostly deletions here. We still want you to do the PIPA bias EMS bias test which is scheduled at 239 50.

09 23 18 54 LMP You say cancel that?

09 23 18 55 CC No, negative. We still want you to do that one.

09 23 18 58 CDR We did it before the burn, which is much more significant. It's already done.
<table>
<thead>
<tr>
<th>Time</th>
<th>Call</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 23 19 04</td>
<td>CMP</td>
<td>We didn't do the PIPA bias yet.</td>
</tr>
<tr>
<td>09 23 19 05</td>
<td>CDR</td>
<td>Oh, you want the PIPA bias?</td>
</tr>
<tr>
<td>09 23 19 07</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>09 23 19 08</td>
<td>CDR</td>
<td>Okay. The EMS bias is complete.</td>
</tr>
<tr>
<td>09 23 19 12</td>
<td>CC</td>
<td>Okay. And at 240, you'll have that canister change which you have already been given; you want to delete the sextant calibration test. Okay. I'll be passing you up a state vector and a NAV check along with the landing block data number 26; I'll be sending you a state vector, and I'll be giving you the NAV check.</td>
</tr>
<tr>
<td>09 23 19 37</td>
<td>CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>09 23 19 38</td>
<td>CC</td>
<td>Okay. At 240 30, we'll initiate a charge on batt B. We want to charge batt B, the lowest battery, to verify their repeatability of the lower than expected battery charging performance that we have observed. They have run some chamber tests out at Downey to duplicate this charging, and we have concluded that it's a safe and useful thing to do, which will give us some added electrical capacity. But even without battery B, we've got sufficient electrical capacity for any kind of entry and stay time on the water.</td>
</tr>
<tr>
<td>09 23 20 20</td>
<td>CDR</td>
<td>What kind of stay time?</td>
</tr>
<tr>
<td>09 23 20 22</td>
<td>CC</td>
<td>18 hours.</td>
</tr>
<tr>
<td>09 23 20 23</td>
<td>CDR</td>
<td>Eighteen?</td>
</tr>
<tr>
<td>09 23 20 25</td>
<td>CC</td>
<td>Well, we got more than -</td>
</tr>
</tbody>
</table>
... subtract from about 30 hours; that's more than 48.

Okay. It's 18 with the hybrid reentry, Wally, but we have got way more than that.

Okay.

And coming into -- and everything else that I don't mention stays the same -- you still have the photography, and at 241, we'll power --

We are cancelling out H2 heaters and purge?

Roger. Yes, that's all done; we picked that up a little later. H2 heaters and the purge are cancelled, the G&N power down at 241. And --

241?

Yes, 241 plus 00.

G&N and SCS, right?

Right.

Okay. What I need, and you might do that now, is get the fuel reading.

Okay. I've got that for you.

And if we have the fuel, I'd like to read the SCS up for awhile and use that fuel for photography and pulse mode.

Okay. Your RCS chart value is 496 pounds.

Okay. It looks -- let's use some of that fuel today; we can't use much of it tomorrow.
09 23 21 35 CC Okay. Wally, stand by on that value here; I'll be giving you an updated one here. Let's go ahead and finish this flight plan update.

09 23 21 45 CDR Okay.

09 23 21 46 CC At 241 10, we want to delete the P23 trunnion bias check.

09 23 21 53 CDR Roger.

09 23 21 54 CC And at 242, then you'll delete that power down?

09 23 22 00 CDR Okay. We can power down the G&N.

09 23 22 02 CC Yes, power down to G&N.

09 23 22 04 CDR Okay. We'll leave the SCS up for now.

09 23 22 06 CC Okay. For that, you'll have your power down at 241, and then we are just deleting the power down at 242. We're just powering you down an hour earlier.

09 23 22 17 CC You still have the window photography at 2½ -

09 23 22 19 CDR Okay.

09 23 22 20 CC You still have the window photography at 242 30, and the chlorination - okay, over 24¾, we want to delete the cryogenic stratification test.

09 23 22 39 CDR CHYO out at 243. Do you want more chlorine in?

09 23 22 43 CC Roger. The chlorination still stands.

09 23 22 47 CDR Okay. We are just about right on that, so I think it would be just about right to run it every other day.

09 23 22 51 CC Okay, fine.
Okay. Coming on that next page of 244, you'll delete the stratification test.

Roger.

Everything else on that page stays the same; there is an addition at 245 40. That's the $H_2$ line heaters on; and at 246, an $H_2$ fuel cell purge; and you will be deleting the canister change at 247; and you are picking that up at 250. And the remainder of the flight plan looks pretty good, Wally.

Okay. I'd like to start stowing the cockpit today, and I'd like to drop that humidity survey; we filled in the block on that anyway.

Okay, we'll - and -

We'll do the humidity survey at 245 20.

Okay. We'll let you know on that over Tananarive. Your chart value updated is 503, and the doctors have come up with a recommended Actifed schedule to give you the maximum crew comfort on reentry. They are recommending each crewman take one tablet at 241, another tablet at 249, and a third one at 257, and this is, the 257 one, is the most important.

Okay. Got that. Jack, broadcast in the blind at Tananarive if we don't answer.

Okay. Will do, Wally.

Okay.
09 23 24 51 CC We are just about to lose you; Tananarive at 32.
09 23 25 00 CMP Jack, has the C2 ... been deleted for the rest of the mission?

TANANARIVE (REV 151)

09 23 36 23 CC Apollo 7, Houston through Tananarive.
09 23 36 28 CDR Roger. All and clear, Jack.
09 23 36 30 CC Okay. You're about four-by.
09 23 36 33 CDR Well, very good.
09 23 36 44 CDR Jack, our CO2 is reading quite low, less than one tenth of a mm of mercury. I would ride a little bit more there. It seems to be a very normal gage.

09 23 37 00 CC Okay. Wally, we are going to have to wait until Carnarvon to get it; we've got an 8 minute pass at Carnarvon. I got something about a tenth of a mm, but I didn't quite copy all.
09 23 37 13 CDR Say again.
09 23 37 15 CC Let's wait till Carnarvon to get your last transmission. We pick up Carnarvon at 48.
09 23 37 22 CDR Okay. There is another question.
09 23 37 41 CC No, Wally, we don't have any other information for you. We'll see you at Carnarvon.
09 23 37 47 CDR Roger. Standing by.

CARNARVON (REV 151)

09 23 49 10 CC Apollo 7, Houston through Carnarvon.
09 23 49 13 LMP Roger. Loud and clear, Jack.
Roger. Loud and -

Jack, I think what you heard me say is that we would like to check our fuel budget and use the SPS for about two revs or more, depending on how the fuel goes, to get some photography to finish up our films.

Okay. Wally, I'll be coming to you with some DAP redline values and some recommendations on that.

We'll have to do it right away, unless we're down that low. That will be all right; we'll use SPS to come down on the DAP redline. That sounds good.

Okay.

We buy the SPS, obviously.

You're sure looking good.

Jack, on that canister change at 240 even, we've got pretty good canisters in there now. We're less than 1 mm of CO₂. I think I would like to let this known canister run along to about 3 mm in CO₂ and then go ahead and change it out and put back in the - our last brand new one, and then we won't have to count very much on the one that was in there at launch.

Okay. Walt, let us get back to you on that.

Okay. Walt, on your proposal there on the canister changes, we concur.

Thank you.
Okay. Wally, you might be interested that your orbit we're tracking is now 90.0 by 231.1.

Roger.

Do you know what we read onboard? 230.9 by 90.0. I think.

Yes, I copied that. I wrote that down.

Do you read 231 even as what you are painting?

Negative, 231.1.

Sorry, you are off by .2 miles.

I'll tell FIDO.

Tell him to watch out, with all of this high calorie food, we may be as big as he is; we don't know yet.

Roger. Copy that.

So far, unless he's gone over 200, though he has improved since that last simulation.

Roger.

Jack, you might send a call to the Pollution Control Board and have them check that smoke off Galveston. It looks terrible today.

Okay. Copy that, Wally.

Okay. Wally, I've got some recommendations for RCS fuel here.

Go ahead.

Okay. A and D are your best quads. B and C are above the DAP redline, not uncomfortably now, but I recommend that you be very sparing when you use
quad Baker and Charlie. And so when you are
maneuvering don't use more than 5 pounds of RCS
fuel for this - your picture-taking.

<table>
<thead>
<tr>
<th>Time</th>
<th>Role</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>09 23 54 16</td>
<td>CDR</td>
<td>Roger. That's just about all we need.</td>
</tr>
<tr>
<td>09 23 54 18</td>
<td>CC</td>
<td>Okay, fine; and we're recommending B and D roll.</td>
</tr>
<tr>
<td>09 23 54 24</td>
<td>CDR</td>
<td>B and D roll. Roger.</td>
</tr>
<tr>
<td>09 23 54 29</td>
<td>LMP</td>
<td>Jack, are you getting this PIPA bias numbers in downlink?</td>
</tr>
<tr>
<td>09 23 54 40</td>
<td>CC</td>
<td>If you will just wait a minute, Wally, we'll catch you. Okay. We're getting them now.</td>
</tr>
<tr>
<td>09 23 54 57</td>
<td>CMP</td>
<td>Would you like me to read you the results, or have you got my results off the DSKY?</td>
</tr>
<tr>
<td>09 23 55 03</td>
<td>CC</td>
<td>Bob, we'll copy that now, Donn. Just give us a few seconds here, and we will have it all down.</td>
</tr>
<tr>
<td>09 23 55 09</td>
<td>CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>09 23 55 15</td>
<td>CDR</td>
<td>By the way, on the schedule for the Actifed, we looked at our schedule for the flight about 3 days ago and Dr. Walt Cunningham, mostly, finalized it, and there was one minor anomaly in the whole schedule.</td>
</tr>
<tr>
<td>09 23 55 30</td>
<td>CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>09 23 55 36</td>
<td>CDR</td>
<td>So the doctors are doing pretty well down there.</td>
</tr>
<tr>
<td>09 23 55 38</td>
<td>CC</td>
<td>Okay. Donn, would you read out PIPA bias; I guess we lost it. We lost the data.</td>
</tr>
<tr>
<td>09 23 55 44</td>
<td>CMP</td>
<td>Okay. Jack, the PIPA bias I got was X plus 0.09, Y is 0, Z plus 0.08. The bias compensation as</td>
</tr>
</tbody>
</table>
presently loaded: it's plus 1050h plus 0 plus 0.07h0. So they are all very close to axis.

09 23 56 10 CC Okay. Copy that.
09 23 56 14 CDR Jack, unless I don't understand this EMS, what I do to EMS bias is run it in DELTA-V and AUTO for the 30 seconds prior to the burn and the duration of the burn. That's all I am ever going to do in flight anyway. If somebody has some better ideas, I'll do it.

09 23 56 32 CC Okay --
09 23 56 33 CDR After all, that's all you use it for.
09 23 56 35 CC Okay. We copy that.
09 23 56 39 CC Okay. We are about to lose you over Carnarvon; we'll pick you up at Guma on the hour.

09 23 56 41 CC Roger. I'm going to coarse align and plane enroute.
GUAM (REV 151)

10 00 01 37  CC  Apollo 7, Houston through Guam. Standing by.
10 00 01 44  CMP  Roger.
10 00 01 46  CC  Walt, one addition to the flight plan is a fuel cell $O_2$ purge at 249 plus 30.
10 00 01 57  IMP  Roger.
10 00 02 06  CC  And I've got the morning news here.
10 00 02 12  CDR  Okay. We'll copy.
10 00 02 14  CC  Okay. The papers and television this morning are loaded with pictures of the big wedding over in Greece. And Gladys brought much needed rain to North Carolina. It had been suffering from a drought. Maurice Chevalier, who is 80, made his final stage appearance in Paris yesterday. He's been in show business for 63 years. And over to some of the pro ball results: Green Bay and Detroit tied, Chicago whomped Philadelphia, San Francisco over New York, New Orleans beat Pittsburg, Dallas over Minnesota, Cleveland upset Baltimore, St. Louis slaughtered Washington, LA beat Atlanta, and the Oilers, you got.
10 00 03 03  CMP  So Mendell got beat.
10 00 03 12  CC  That's in the papers today, too.
10 00 09 30  CC  Okay. Apollo 7, Houston. About 30 seconds LOS Guam; Hawaii at 15.
10 00 09 36  CDR  Roger.
Apollo 7, Houston through Hawaii.
Roger.
Walt, on the primary evaporator, we would like to have you reservice it and leave it off.
Roger. Two minutes worth?
Affirmative.
Apollo 7, Houston. We are ready to send you the NAV vector, state vector update. Would you go to ACCEPT?
And I have the NAV check for you when you are ready to copy it.
Ready to accept, Jack.
Okay. Coming up.
Go ahead with your NAV, Jack.
Okay. GET 246 plus 30 plus 0000 plus 2607 plus 15014 0947.
246 30 0000 plus 2607 plus 15014 0947.
Roger. That's correct.
And we'll be waiting a rev to give you the block data number 26.
Okay. Could you give us a map update?
Okay -
We would like to have the present orbit or the last one that you got.
10 00 17 56 CC Okay. Stand by here. NAV check is in, state vector is in, and the computer is yours.
10 00 18 09 CC Okay. The present orbit for a map update 239 plus 59 plus 37, longitude 127.9 degrees east.
10 00 18 34 IMP Roger. Thank you, Jack.
10 00 18 42 CDR We are GO on your NAV check.
10 00 18 45 CC Copy.
10 00 21 03 CC Apollo 7, Houston.
10 00 21 06 IMP Go ahead, Jack.
10 00 21 07 CC Roger, Walt. We are copying a little bit high on the steam pressure; did you do a normal service on primary evaporator?
10 00 21 21 IMP Negative, Jack, but I got more than 2 minutes of water in it.
10 00 21 26 CC About how many minutes did you put in?
10 00 21 31 IMP That was a little over 3 minutes.
10 00 21 32 CC Okay. Copy.
10 00 29 42 CC Apollo 7, opposite omni.
10 00 29 50 IMP You are on A now.
10 00 29 51 CC Okay.
10 00 30 01 IMP Any suggestions on the water boiler?
10 00 30 07 CC No, Walt; we are still looking at massaging that down here.
10 00 30 27 CC Walt, what we're doing is, we are going to do is, that we are comparing that primary evaporator now with previous couple of days data.
10 00 33 26  CC  Apollo 7, Houston.
10 00 33 28  IMP  Go ahead, Jack.
10 00 33 32  CC  Have you initiated a battery charge on B yet?
10 00 33 36  IMP  Just now pulling the battery relay circuit
    breaker.
10 00 33 38  CC  Okay. Fine. We want to take a look at it before
    LOS Texas here.
10 00 33 50  IMP  It's about the same thing it started at the other
    day, I think, a little over 2 amps.
10 00 33 54  CC  Okay.
    HAWAII through TEXAS (REV 152)
10 00 35 01  CC  Hey, Walt, we are about 1 minute LOS Texas; we
    pick up Ascension at 5% for a short pass.
10 00 35 08  IMP  Roger. You reading the battery charge burn?
10 00 35 10  CC  Roger. Shoving 2.3.
10 00 35 13  IMP  Roger. I'll make this a normal charge, down to
    .5 amps.
10 00 35 17  CC  Affirmative.
    ASCENSION (REV 152)
10 00 55 02  CC  Apollo 7, Houston through Ascension.
10 00 55 08  IMP  Hey, Jack, do you have ... spacecraft ...
10 00 55 18  CC  Walt, we have a keyhole effect here at Ascension;
    you're about two-by. I can just barely make it
    out.
10 00 55 25  IMP  Roger. We understand.
Apollo 7, 1 minute LOS Ascension; we pick you up at Tananarive at 08.

... 

TANANARIVE (REV 152)

Apollo 7, Houston through Tananarive. Standing by.

Apollo 7, Houston through Tananarive. Standing by.

Apollo 7, Houston. We're about 2 minutes LOS Tananarive; we pick up the Mercury at 34.

Houston, Apollo 7. Out.

MERCURY (REV 152)

Apollo 7, Houston through Mercury.

Apollo 7, Houston.

Apollo 7 here.

Okay. Wally, just one little bit of information I wanted to get from you. I want to see how that crack in the MET has progressed after this last burn.

Looks like we have the one I described on the left side above "Hundreds of hours."

Right. That's it.

It has already reached the bottom of the glass trellis and the top below the "h" in the word "hours" to the bottom of "tens of hours." That goes all the way through. There are two smaller
cracks that have developed above "Hundreds of hours." The crack on the second side has not changed since we first observed it.

10 01 35 33 CC Okay. Something you might give some thought to on entry is saving some tape out before you re-stow everything and taping this glass up so that it probably doesn't come out when you splash down.

10 01 35 59 CDR Very good.

10 01 36 08 LMP Hey, Jack, this is Walt.

10 01 36 09 CC Go ahead.

10 01 36 11 LMP Roger. About 45 minutes ago, I turned the $O_2$ fans back AUTO and ran the fans 2 for 3 minutes.

10 01 36 22 CC Okay. We copy that, Walt. And I have a —

10 01 36 27 CDR Jack, we've been trying to play a single thruster for roll, and I am not sure yet what quad you want to use for that.

10 01 36 33 CC Okay. We want to save quad B, Baker and Charlie, so use quads Alfa and Delta as much as you can.

10 01 36 48 CDR Okay. Do you have, on the back of our schematics book, the plate on the thrusters?

10 01 36 58 CC I can get it for you. You want to know circuit configuration?

10 01 37 03 CDR Right. We've got it on the back of our schematics book, and I tried that, and it doesn't work.

10 01 37 11 CC Okay.
It's the taped-in chart that came from the logistics training manual, Jack.

Okay.

Should be on the set you have there as a backup set.

Yes, I've got it here.

I'll have Walt call out what he told me.

Okay. It's probably in the front of yours.

Yes, I've got it.

Okay. We were trying to use the quad A roll, and the channel switches were in A. So we pulled circuit breaker for A and C roll 2 main A. The channel switches were in A.

Okay.

That should give us A1 and A2 only, right?

Right. You're not using it on minimum impulse, are you?

Yes. You have to use minimum impulse. That's B and D, isn't it?

No, when you're in minimum impulse, you're going to use quads Baker and Charlie.

B and C, yes. That's what we did.

Okay. Then when you pull AC roll to main A, you're going to knock out quads - the roll jets in quad Charlie.
Yes, but right now, you want us to use A and D; but whenever we're at minimum impulse, we use B and C, so it looks like we're SOL for this one.

Right. You'll have to go to ACCEL COMMAND if you want to get that configuration.

I think we will probably stay like this at MIN impulse.

Okay.

Yes, that's much cheaper, Jack.

Right.

We'll use an A and C roll.

Okay.

ACCEL is pretty nice, but if you bump it accidentally, you hose out quite a bit.

Okay. We would like you to use B and D roll. You have a little more margin on quad Baker than you do on quad Charlie if you're going to be in minimum impulse.

Since we finished the burn, we have used 19 pulses.

Okay.

I'm working on 50 pulses per pound.

Okay. And I have your block data number 26 when you're ready to copy it, Walt.

Go ahead. I'm ready to copy.
Okay. 153 dash 4 Alfa plus 254 minus 1610 243
plus 11 plus 05 3069, 154 dash 1 Charlie dash 4
Charlie plus 163 minus 1610 244 plus 47 plus
45 2700, 155 dash Alfa Charlie minus 236 minus
0100 245 plus 22 plus 22 6914, 156 dash Alfa Charlie
minus 139 minus 0110 246 plus 55 plus 49 6280, 157
dash Alfa Charlie minus 0170 248 plus 28 plus 57
5782, 158 dash Alfa Charlie plus 053 minus 0250
250 plus 02 plus 00 5113. End.

GUAM (REV 152)

Okay, Jack. Readback follows, and before that,
we have just a couple more revs to go on the block
data after this. If you get a chance, why don't
you pass it up, and we will get it out of the way?
Also, we would like that block data through
REV 165. Over.

Okay. Copy that.

Readback follows: 153 dash 4 Alfa plus 354 minus
1610 243 plus 11 plus 05 3069, 154 dash 4 Charlie
plus 163 minus 1610 244 plus 47 plus 45 2700,
155 dash Alfa Charlie minus 236 minus 0100 245 plus
22 plus 6914, 156 dash Alfa Charlie minus 139 minus
0110 246 plus 55 plus 49 6280, 157 dash Alfa Charlie
minus 040 minus 0170 248 plus 28 plus 57 5782, 158
dash Alfa Charlie plus 053 minus 0250 250 plus
02 plus 00 5113. Over.
Roger. That's got it. We are working on the
remaining block data.

I'd like one block, one rev past deorbit.

Copy. We are about 50 seconds LOS Guam; Hawaii
at 52.

Roger.

HAWAII through GUAYMAS (REV 152)

Apollo 7, Houston through Hawaii. Standing by.

Thank you.

Houston, Apollo 7.

Go ahead, 7.

Jack, I would like to give you an inventory of
the film we have left, and I would like to have
the people who are involved ... in the ... and
the way they have them call up targets, too. I
don't even know where we are going, and maybe we'll
be able to get some pictures for them. We have
25 frames of 368 left and 364, and approximately
48 frames of Panatomic-X; this is black and white.

Okay. Wally, you faded in and out on that. I did
copy that you got about 20 frames of Panatomic-X
left, but I didn't copy the number of frames in
30368.

25 frames in 368.

25 frames in 368, and you would like - as I
understand it - for us to give you some desired
targets of oppor

correct?

Roger. It's only

tion.

Okay. We will see
desired targets as
quent rev.

We have got the fi
48 frames Pan-X.

Copy that.

Apollo 7, opposite
Houston, Apollo 7.

Say again, 7.

Roger. I think the
down to about half

Okay.

Apollo 7, Houston.

Guamai; we pick u

Roger.

Apollo 7, Houston;
y

Okay. Jack.

Okay. Reading abo

Surprised that you
Roger. Coming up over Guam, I'll pass you some of that information on terrain photographic targets.

Roger. We are chlorinating now.

Okay. Copy that.

It took a long time.

Okay. I have some of that information on photography here.

Apollo 7, Houston through the Mercury.

Okay. I'll try to give you some times on the - well, in the next rev, you'll hit the west coast of South America about 245 32 and the east coast about 245 37. And if it's hazy, don't shoot the
368 film, and we'll give you some more targets later on.

10 03 10 19  CDR  We hear you.
10 03 10 21  CC  Okay. On the Pan-X, they are requesting on this rev here - on that 245 32 - a strip exposure, one exposure every 10 seconds from 245 32 until 245 37, all the way across South America to the water. And use the red filter on the Pan-X film.

10 03 10 54  LMP  Is that for weather photography?
10 03 11 00  CC  Okay. It's a strip photography of the land; it's not really weather.
10 03 11 07  CDR  You want red only and not red and green. Is that right?

10 03 11 09  CC  No, red only.
10 03 11 11  CDR  Okay.
10 03 12 28  LMP  Jack, you still listening?
10 03 12 32  CC  Go ahead.
10 03 12 34  LMP  I've got the S0368 at 243 55; I think you said something about 244 01.

10 03 12 48  CC  Okay. You'll hit the west coast of South America at 243 55, and you could take some pictures there, water to land. And then at 244 01 - that's what time you'll hit the east coast of South America and could take some S0368 land to water. Did I confuse you?

10 03 13 21  CC  Opposite omni, 7.
Apollo 7, we are 1 minute LOS Guam; we pick up Hawaii at 27.

HAWAII through HUNTSVILLE (REV 153)

CT Hawaii AOS.

CC Hawaii, Houston. Do we have AOS yet?

CT Affirmative.

CC Apollo 7, Houston.

SC Go ahead.

CC How's it going?

SC Roger. Loud and clear.

CC Roger. Got some late data for you here. Let me read it off.

SC Just a second here; I'm just clearing up. We just took some movies of Walt getting in his suit.

CC Stand by one.

SC Roger.

SC Okay. Go ahead.

CC Roger. Okay. I'd like to give you some data here on landing without helmets. Number 1: we don't have any. Number 2: we are expecting Z-axis acceleration of 7.8 which, to give you a reference, is twice - little over twice what we had in Gemini, which was 3.4. Number 3: there is about a 30-percent probability - there again
it is a function of winds and wave actions -
that you can get a tripping action or a rotation
on impact of about 200 degrees a second. The
Concern here is that you are probably going to
get some head impact with either the headrest,
the struts, the girthring, or anything else that
happens to be in the general area. In summary,
we are concerned about getting some head damage
if you impact without the helmet on. I think,
on the other hand, we have some data that shows
that you can impact without the helmet attached
to the neckring and have reasonable protection;
this has been done on a couple of sled tests.
So our recommendation is that you come in with
the gloves off; try to have the helmet in the
vicinity of your head at least, probably on it;
this you are going to have to check out and see
whether you can't reach up there and clear your
ears by reaching your fingers in between the
neckring and the helmet. And ideally, of course,
you'd attach the helmet to the neckring, say
around 2K before landing, or if you can't do that,
the next best thing is to have it on your head.
You got all that?
Yes. We've fitted up our couches pretty well
with the way our heads pretty well constrained
- with food bags and tape, just to get our buffer. This is about all you can do with that. The helmet is — or our problem is — if we have to blow our nose; we are filled up with mucous, and we feel when they put some g on us, our sinuses are going to drain as well. We just are going to have to play that one out, I guess, Deke, and if it gets bad, throw the helmet down.

---

CC
Okay. That's probably true. I think you ought to start in with the helmet in any case —

---

SC
We are pretty well convinced we will pop our ears.

---

CC
Roger. Okay. I think you understand the problem. You remember Gemini 3, where we ended up with a broken visor on Gus — and we may have a few other things like this on this one — we really aren't that smart about yet.

---

SC
Understand.

---

CC
We'd hate to ruin that pretty profile on the landing.

(—)

SC
(Laughter) Okay. Well, give us — we understand the problem, and I think that's all we can do with it. And we'll work on it any way we can. Sure appreciate people working on it for us.

---

CC
Okay. So you are going to try to come in with them on and crack them; so that'll solve it.
Try to clear your nose then on the way down, right?

---

SC Roger. It's really the case of solving ... It's trying to blow our nose; we feel we are going to be coughing and possibly the stuff going in our throats when you put g on. I'm still blowing my nose right now, and I am two Actifed down the road.

---

SC Roger.

---

SC And all we see there together - if we can blow our noses inside the helmet, that's going to be tricky. We'll have to play with it, I guess. We'll try it out a little bit early.

---

CC Okay. Fine.

---

SC Roger. Thanks to you.

---

CC Apollo 7, Houston. One minute LOS Huntsville; Tananarive at 244 plus 20.

---

CC They were down below, Wally, and they are on their way back now.

---

IMP Okay.

---

CC They were --

---

CC Okay. Walt, we copy a battery charging current of 0.41 so you can turn the battery charger off now at any time.
<table>
<thead>
<tr>
<th>Time</th>
<th>User</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 03 37 48</td>
<td>CDR</td>
<td>Say again, Jack.</td>
</tr>
<tr>
<td>10 03 37 51</td>
<td>CC</td>
<td>See you at Tananarive.</td>
</tr>
<tr>
<td>10 03 37 57</td>
<td>CC</td>
<td>Wally, you can turn the battery charger off on batt B.</td>
</tr>
<tr>
<td>10 03 38 05</td>
<td>CDR</td>
<td>Okay.</td>
</tr>
<tr>
<td>10 03 38 19</td>
<td>CT</td>
<td>Huntsville LOS. Apollo 7 did not copy your last transmission.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>TANANARIVE (REV 154)</strong></td>
</tr>
<tr>
<td>10 04 21 24</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive.</td>
</tr>
<tr>
<td>10 04 22 09</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive.</td>
</tr>
<tr>
<td>10 04 24 22</td>
<td>CC</td>
<td>Apollo 7, Houston through Tananarive.</td>
</tr>
<tr>
<td>10 04 24 27</td>
<td>CDR</td>
<td>Roger. Loud and clear.</td>
</tr>
<tr>
<td>10 04 24 29</td>
<td>CC</td>
<td>Roger. You are loud and clear also.</td>
</tr>
<tr>
<td>10 04 24 32</td>
<td>CDR</td>
<td>...</td>
</tr>
<tr>
<td>10 04 24 49</td>
<td>CC</td>
<td>Wally, for a point of information, we are assuming that stowage will be nominal for retrofire. If you have any items that are stowed non-nominally, would you let us know for cg purposes? We would like to calculate cg rather closely.</td>
</tr>
<tr>
<td>10 04 25 14</td>
<td>CDR</td>
<td>Understand ...</td>
</tr>
<tr>
<td>10 04 25 27</td>
<td>CC</td>
<td>Okay. COMM is not the best here. You can give us a report over the Mercury on that subject. We will hit the Mercury at 44.</td>
</tr>
<tr>
<td>10 04 28 25</td>
<td>CC</td>
<td>Apollo 7, Houston. One minute LOS Tananarive.</td>
</tr>
<tr>
<td>Time</td>
<td>Call</td>
<td>Text</td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>10 04 45 09</td>
<td>CC</td>
<td>Apollo 7, Houston through Mercury. Standing by.</td>
</tr>
<tr>
<td>10 04 45 15</td>
<td>CDR</td>
<td>Roger. Stand by. We're working on our pictures.</td>
</tr>
<tr>
<td>10 04 45 18</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>10 04 45 20</td>
<td>CMP</td>
<td>Good morning, Ron.</td>
</tr>
<tr>
<td>10 04 45 21</td>
<td>CC</td>
<td>Good morning, Donn.</td>
</tr>
<tr>
<td>10 04 45 24</td>
<td>CMP</td>
<td>The redundant component check is complete, except for the main regs. I may get those over Hawaii; we're waiting for sunrise here.</td>
</tr>
<tr>
<td>10 04 45 31</td>
<td>CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>10 04 47 58</td>
<td>LMP</td>
<td>Ron, I'm assuming you are recording down there. We're watching the sunrise come up. We're going to film it with ASA 1,000 film. At first, we saw some kind of a lightish gray with hardly any color, and then a very light blue, which turned into a little darker, like maybe a magenta. That blue at 1.8 degrees, we're starting to get the orange now, and it's just about light enough out there, where we can catch the clouds on the far horizon, maybe a hundred miles away being in profile. And I'm going to have to let go here in a second and start running the camera.</td>
</tr>
<tr>
<td>10 04 48 36</td>
<td>CC</td>
<td>Roger. We have it recorded.</td>
</tr>
<tr>
<td>10 04 50 53</td>
<td>LMP</td>
<td>After the blue layers which had various layers within itself, with the light and dark alternating, we got our layer of yellow which is</td>
</tr>
</tbody>
</table>
almost white, and then went on into an orange.
At first, it's a fairly dull orange, and then
it's getting very bright.

10 04 51 09  CC  Roger.
10 04 51 13  IMP  Ron, we ran out of film just as the sun broke
the horizon.
10 04 51 47  CC  Yes, yes.
10 04 51 50  CDR  This is really working out, Ron. I'm running a
light meter and holding the spacecraft.
10 04 51 54  CC  Roger.
10 04 51 59  CMP  We went all the way from one-fiftieth of a sec-
ond at two, moving on up while the sun was rising
till we had a P22 and 1250, and I hope it turns
out.

10 04 52 12  CC  Roger.
10 04 52 19  CDR  We have so far 160 pulses which I estimated
about 3 pounds.
10 04 52 33  CC  Roger. LOS.

HAWAII (REV 154)

10 05 05 12  CC  Apollo 7, Houston through Hawaii.
10 05 05 16  CDR  Loud and clear.
10 05 05 17  CC  Roger. The same.
10 05 05 30  CDR  Ron, do we have the O\textsubscript{2} manifold pressure?
10 05 05 34  CC  Roger. 103.
10 05 05 38  CDR  Roger. Switching.
10 05 05 49  CC  10\textsubscript{4} now.
10 05 05 55 CDR The redundant component check is GO.
10 05 05 59 CC Roger.
10 05 06 16 CDR I guess you heard we changed the word landing
to crash.
10 05 06 20 CC Roger.
10 05 08 24 CC Apollo 7, Houston. Thirty seconds LOS, Redstone
at 19, and we still show secondary coolant loop
in operation.
10 05 08 41 IMP Just the pump.
10 05 08 44 CC Concur.
REDSTONE (REV 155)
10 05 20 28 CC Apollo 7, Houston through Redstone. Standing
by.
10 05 20 31 CDR Roger, Ron.
10 05 20 33 CC Roger. Loud and clear.
10 05 22 54 CC Apollo 7, Houston. Thirty seconds LOS; Ascension
at 33.
ASCENSION (REV 155)
10 05 43 48 CC Apollo 7, Houston through Ascension. Standing by.
10 05 46 05 CDR This is Apollo 7.
10 05 46 08 CC Houston. Go.
10 05 46 10 CDR Roger. We shut down the SCS at 38 minutes after
the hour, and ... fuel.
10 05 46 22 CC Apollo 7, Houston. Say that again.
10 05 46 25 CDR Roger. We shut down at 245 hours 38 minutes on
SCS.
... fuel.

Roger. Copy.

That's about 4 pounds as we figure it, and not nearly as bad as the 45 we blew yesterday on a crazy experiment.

Roger. Copy that.

7, Houston. Your surge of power was observed that time.

Roger. That's what you get when you're driving an Austin Healey.

(Laughter).

7, Houston. Opposite omni.

Roger.

Apollo 7, Houston. Thirty seconds LOS; Mercury at 20.

MERCURY (REV 155)

Apollo 7, Houston through Mercury. Standing by.

Loud and clear.

Roger. The same.

Hey, Ron, I've got two questions I'd like to have answers for, when you can get it.

Roger. Go.

One has to do with the fuel cells. We're presently planning to power up tomorrow morning
somewhere in the 25th hour; that's so Donn can
get some alignments out of the way before we get
up. And fuel cell 2 has been going to worms a
little faster each day. When I get up, it looks
like it's climbing at a fairly healthy rate; I'd
like to open-circuit fuel cell 2 and put it back
on the line at about T minus 45 minutes or
T minus 30 minutes. That's the first point. The
other one is on the primary evaporator. I over-
serviced that today, and I guess we don't know
exactly how much water I got in it. It was on
for more than 3 minutes though. And I wanted to
know are we planning on bringing the primary
evaporator back on the line or not, and I suspect
we probably just as well not do it, and I'd like
to just go ahead and change ... secondary coolant
loop with radiator bypass and put the suit circuit
on the secondary coolant loop. Over.

Roger. Say the last on your primary evaporator,
after are we planning to use it, everything after
that.

Okay. The details are down there already on - I
overserviced the evaporator. I guess what I'd
prefer to do instead of risking any possible prob-
lems with the steam dust, I would like to just go
ahead and activate secondary coolant loop with the
radiator bypass and put the suit circuit secondary coolant loop and run a primary loop just on radiators.

10 06 23 07 CC Roger. Copy your comments; will advise.
10 06 23 12 IMP Okay.
10 06 23 15 IMP I checked all the command module RCS engine temps about an hour ago. They're already at high loads; we don't plan on heating the command module RCS engines.
10 06 23 28 CC Roger. We concur on RCS engine heaters; that is, it's not necessary to heat.
10 06 23 37 IMP Roger.
10 06 23 41 CC Apollo 7, Houston. Opposite omni.
10 06 26 19 IMP Hey, Ron, if you're still there, can you give me my present battery status? We did a charge on battery 2 today, battery B.
10 06 26 29 CC Roger. We're working on it now; we'll get it up to you, probably over Redstone.
10 06 26 33 IMP Roger. Thanks.

REDSTONE (REV 155)
10 06 52 41 CC Apollo 7, Houston through Redstone. Standing by.
10 06 52 46 IMP Roger, Ron.
10 06 52 51 CC We're checking all angles which you called down. No answers yet.
10 06 52 57 IMP Roger. Thank you. I knew you guys would do your best.
10 06 53 07  CC    Say again, Walt.
10 06 53 10  IMP    Roger. I knew you guys would do your best.
10 06 53 14  CC    Roger.
10 06 53 42  CC    Apollo 7, Houston. Opposite omni.
10 07 00 09  CC    Apollo 7, Houston. Thirty seconds LOS; Ascension at 18.
10 07 00 15  IMP    Roger, Ron.

**ASCENSION (REV 156)**

10 07 19 29  CC    Apollo 7, Houston through Ascension. Standing by.
10 07 19 34  IMP    Roger. Loud and clear.
10 07 19 43  CC    And - 7, Houston - I have your battery status if you desire.
10 07 19 48  IMP    Go ahead.
10 07 20 09  IMP    You mean after we did that charge this afternoon on batt B, it's still got only 26 hours?
10 07 20 15  CC    That's affirmative.
10 07 20 17  IMP    Okay. Thank you.
10 07 20 22  IMP    You might say we're hard chargers.
10 07 20 26  CC    Roger.
10 07 21 28  IMP    Say, Ron, would you give me 35 clicks on the water pistol over the last 4 hours?
10 07 21 33  CC    Wilco.
7, Houston. The Chronicle refers to the "Majestic Apollo 7 flying machine." And they say Apollo is winding up the loose ends.

Winding up what?

The loose ends.

Winding up what, again?

Roger. The headlines say the Apollo is winding up the loose ends. E-N-D-S.

We think it's a magnificent flying machine, too, Ron.

What's the loose ends for? I think we're kinda taut.

(Laughter) Concur.

We just found out today we're not in a landing craft.

No comment.

It looks like the wires' pictures made the paper tonight, too. They were out at the Astrodome watching the Oilers' game last night.

Yes, I guess they would. Jo's a complete fan of that outfit.

Yes.

About 30 seconds to LOS; Mercury at 56.

Roger, Ron. We'll be just about fading out and let Donn carry on the happy evening.
Roger.
We've had a pretty good day.
We concur. I'll see you down at the Cape.
Roger. Ron, thanks a lot.

MERCURY (REV 156)

Apollo 7, Houston through Mercury. Standing by.
Roger, Ron. Loud and clear. How me?
Roger. Loud and clear.
Good show on that team. Like to speak to Flight, if I may.

Apollo 7, Houston Flight. How do you read?
Flight, Apollo 7.
Apollo 7, Houston Flight. How do you read?
Loud and clear, Gene.
Roger. How're you doing, Wally?
Very good. I want to thank you and your team for an outstanding job; it was a very professional show and one we've really enjoyed.
Okay. Thank you very much, Wally.
Walt, would you like to say a word?
Say, Gene, thanks a million. It wouldn't have been such a great flight without the great support we had down there. We have a magnificent flying machine up here, but we wouldn't have been going this long without you guys.
10 07 57 41  F  Okay. We'll be seeing you.
10 07 57 45  CMP  This is Donn. That goes for me, too, Gene.
10 07 57 47  F  Okay, Donn.
10 07 57 48  CMP  Very big help ...
10 07 57 49  F  Roger. See you later now, Donn.
10 07 57 50  CMP  Staying right in there with us.
10 07 57 52  F  Roger.
10 07 57 53  CDR  We'll see you cats back in the big "H" and dry some more beer up.
10 07 57 57  F  Okay.
10 07 59 44  CC  Apollo 7, Houston. Opposite omni.

10 08 04 32  CMP  Houston, Apollo 7.
10 08 04 34  CC  Houston. Go.
10 08 04 35  CMP  Roger. Log six clicks on the water gun for Walt, please.
10 08 04 38  CC  Wilco.
10 08 04 41  CMP  And make it ten for Wally.
10 08 04 44  CC  Roger.
10 08 04 45  CMP  And you better make it about 20 for me over the last 3 hours.
10 08 04 49  CC  Will do.
10 08 04 53  CMP  Ron, incidentally, I haven't been keeping a very good check on that water consumption for the last couple days; so if the doctor's concerned about it, tell him not to worry about it. I've been
drinking plenty, I just haven't got it all logged in.

10 08 05 06 CC Roger. I understand.

REDSTONE (REV 157)

10 08 27 46 CC Apollo 7, Houston through Redstone.
10 08 27 49 CMP Roger. Houston, Apollo 7.
10 08 27 52 CC Roger. Loud and clear. Standing by.
10 08 27 57 CMP Say, Ron, we've still got a little film up here I'd like to use, and I was wondering if you guys would give me 3 or 4 pounds of fuel so I could go ahead and use it up during the next two or three revs, 3 or 4 pounds of RCS fuel, that is.

10 08 28 15 CC Roger. Stand by. Little garbled there. I understand you want 3 or 4 pounds of RCS fuel to use.
10 08 28 22 CMP Yes, see how we stand on RCS fuel ... I'll get the fuel reading anyhow.
10 08 28 35 CC 7, Houston. Opposite omni.
10 08 28 38 CMP Roger.
10 08 28 56 CC 7, Houston. How's the voice now?
10 08 29 00 CMP Say again.
10 08 29 01 CC Roger. Loud and clear now, Donn. If you can repeat what you were saying -
10 08 29 06 CMP Oh. Roger. I was asking for an RCS fuel quantity reading for our chart, and also asked negotiating for a few pounds of attitude fuel so I can finish off our camera film.
Roger. I understand. Stand by on both counts.

While you’re at it, maybe you can dream up some - or whip up some targeting for pictures.

Donn, we’ll see you at Mercury next rev, and we’ll have the answers available for both at that time.

Roger. Say it again, Walt - Ron.

Roger. We’ll give you the answers to both questions at Mercury on the next rev there.

Okay.

But it looks favorable at this time.

Okay.

Oh, Ron, I’ll give you a film inventory. We have a few frames of Hasselblad color film 368 and a couple of magazines of 16mm for the Maurer camera.

Roger.

I’d like to shoot those out the window at either targets of opportunity or any particular targets that you might be able to give me, that is, you know, at a time when we’re going over a particular item of interest.

Roger.

And we also have some Panatomic-X left.

Check.

I think we’ve got about 25 frames of Pan-X and, oh, I don’t know, six or eight of
368, and I'd say two rolls of camera - of movie film.

10 08 31 63  CC  Roger.
10 08 31 25  CMP  Oh, and while you're at it, could you get me a map update also?
10 08 31 30  CC  Wilco.
10 08 32 02  CC  7, Houston. I have your map update.
10 08 32 07  CMP  Roger.
10 08 32 08  CC  REV 156 at 247 plus 30 plus 38, longitude 12.5 east.
10 08 32 30  CMP  Roger. Would you say it again? My earpiece came out while you were talking.
10 08 32 34  CC  Roger. REV 256, GET 247 plus 30 plus 38, longitude 12.5 east.
10 08 32 51  CMP  Okay. Thank you.
10 08 32 53  CC  Roger.
10 08 33 52  CC  Apollo 7, Houston. The United States has a total of 55 Olympic medals, and 24 of these are gold.
10 08 34 01  CMP  Pretty good.
10 08 34 02  CC  Roger.
10 08 35 27  CC  7, Houston. Thirty seconds LOS; Ascension at 53.
10 08 35 33  CMP  Roger.

ASCENSION (REV 157)

10 08 54 50  CC  Apollo 7, Houston through Ascension. Standing by.
10 08 54 54 \textbf{CMP} Roger. Houston, Apollo 7.

10 08 54 57 \textbf{CC} Roger. I have your RCS quantities if you want.

10 08 55 10 \textbf{CMP} Okay, Ron. Go ahead.

10 08 55 12 \textbf{CC} Roger. At 248 hours, you have a total for your profile of 503 pounds, and I have your redlines if you desire those.

10 08 55 33 \textbf{CMP} Okay. Go ahead with all of them then.

10 08 55 37 \textbf{CC} Roger. SCS redline 533, DAP redline 458, and your hybrid 234.

10 08 55 58 \textbf{CMP} Okay. 503 remaining, 533 SCS, 458 DAP, 234 hybrid.

10 08 56 04 \textbf{CC} Affirmative.

10 08 56 25 \textbf{CC} And -7, Houston - I have block data 27 whenever you want it.

10 08 56 35 \textbf{CMP} Okay. I can take it right now.

10 08 56 37 \textbf{CC} Roger. 159 dash Alfa Charlie plus 140 minus 0330 251 plus 35 plus 18 4565, 160 dash 2 Alfa plus 260 minus 0265 253 plus 13 plus 19 3625, 161 dash 1 Bravo plus 218 minus 0620 254 plus 39 plus 51 4011, 162 dash 1 Alfa plus 278 minus 0642 256 plus 16 plus 31 3446, 162 dash 1 Alfa plus 300 minus 7. Houston. Opposite omni.

10 08 58 40 \textbf{CC} Roger. You got it.

10 08 58 48 \textbf{CC} Roger. On area 163 longitude minus 0645 257 plus 55 plus 28 3007, 164 dash 1 Alfa plus 277 minus 0642 259 plus 39 plus 18 3322, 165 dash
1 Bravo plus 217 minus 0670 261 plus 16 plus 45 3151. Over.

10 09 00 07   CMP   Okay. 159 Alfa Charlie plus 140 minus 0330 251 35 18 4565, 160 dash 2 Alfa plus 260 minus 0265 253 13 19 3625, 161 dash 1 Bravo plus 218 minus 0620 254 39 51 4011, 162 dash 1 Alfa plus 278 minus 0642 256 16 31 3446, 163 dash 1 Alfa plus 300 minus 0645 257 55 28 3007, 164 dash 1 Alfa plus 277 minus 0642 259 39 18 3322, 165 dash 1 Bravo plus 217 minus 0670 261 16 45 3151.

10 09 01 16   CC   7, Houston. You read back correct. We'll have them for the next ten revs later.

10 09 01 22   CMP   Okay. Oh, I hope not!

10 09 02 11   CC   7, Houston. We're wondering about the decongestant that you're taking here about this time.

10 09 02 22   CMP   Oh. Roger. I forgot to log that in. Both Walt and Wally each had an Actifed about 248 30, and I took one at 249.

10 09 02 30   CC   Roger.

10 09 03 28   CC   7, Houston. Thirty seconds LOS; Mercury at 32. And do you show an O₂ purge at 30?

10 09 03 41   CMP   Roger. I do.

10 09 03 42   CC   Roger. Thank you.
Apollo 7, Houston through Mercury. Standing by.

Roger. Apollo 7 here.

Roger, Donn.

Fuel cell purge is complete, Ron.

Roger. And I've got a couple of updates for your S0368 in the Pan-X.

Okay. Go ahead.

Roger. At 251 plus 15, we have some cloud formations over New Guinea, and they're on track. Be good for S0368 film.

Okay. Will do. Can we use some fuel on them?

Opposite omni then. Say again.

Roger. What do you say about using a little RCS fuel to turn these ends so we can get some pictures?

Roger. We're checking on it now. And I have a - at 252 plus 39, we have an S-V target number 34. It will be north of track; use Pan-X with red filter.

Okay. At 39, you've got S-V from a turn north of track; Pan-X with red filter.

Roger. And you have a GO on your WCS. Recommend BD roll channel DISABLED and --

Okay.

Minimum impulse.
<table>
<thead>
<tr>
<th>Time</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 09 34 50 CMP</td>
<td>Roger.</td>
</tr>
<tr>
<td>10 09 35 49 CC</td>
<td>7, Houston. We'd like to power up the CMC over Redstone and watch the time again.</td>
</tr>
<tr>
<td>10 09 35 57 CMP</td>
<td>Okay. Will do.</td>
</tr>
<tr>
<td>10 09 36 00 CC</td>
<td>Roger.</td>
</tr>
<tr>
<td>10 09 36 11 CC</td>
<td>7, Houston. I have another Pan-X update.</td>
</tr>
<tr>
<td>10 09 36 18 CMP</td>
<td>Okay. Go ahead.</td>
</tr>
<tr>
<td>10 09 36 20 CC</td>
<td>Roger. And this is really the number 1 priority - at that 251 plus 00, see Ganges River in India south of track, use Pan-X with red filter.</td>
</tr>
<tr>
<td>10 09 36 46 CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>10 09 37 09 CC</td>
<td>7, Houston. For your information, quad B has 4 pounds margin from the batt redline, and quad Delta has 7 pounds.</td>
</tr>
<tr>
<td>10 09 37 24 CMP</td>
<td>I see. So just don't use TB.</td>
</tr>
<tr>
<td>10 09 37 29 CC</td>
<td>If possible.</td>
</tr>
<tr>
<td>10 09 37 30 CMP</td>
<td>Roger. Got you.</td>
</tr>
<tr>
<td>10 09 41 56 CC</td>
<td>7, Houston.</td>
</tr>
<tr>
<td>10 09 41 59 CMP</td>
<td>Go, Ron.</td>
</tr>
<tr>
<td>10 09 42 01 CC</td>
<td>Roger. I just got word that the - we're going to need a little more time to check that surge of power on the Saturn.</td>
</tr>
<tr>
<td>10 09 42 11 CMP</td>
<td>Okay.</td>
</tr>
<tr>
<td>10 09 42 14 CC</td>
<td>Okay.</td>
</tr>
<tr>
<td>10 09 42 17 CMP</td>
<td>Yes. Roger. I copy.</td>
</tr>
</tbody>
</table>
10 09 43 21  CC  About 30 seconds LOS; Redstone at 03.
10 09 43 27  CMP  Roger.

REDSTONE (REV 157)
10 10 03 09  CC  Apollo 7, Houston through Redstone. Standing by.
10 10 03 14  CMP  Roger.
10 10 03 15  CC  Roger.
10 10 03 23  CMP  Ron, I've got a note in the flight plan that says, "Battery charge as required." Has that already been taken care of?
10 10 03 30  CC  Scratch it out.
10 10 03 32  CMP  Okay.
10 10 07 30  CC  Apollo 7, Houston. Opposite omni.
10 10 07 33  CMP  Roger.
10 10 08 09  CC  Apollo 7, Houston. Everything's up to snuff on the computer. You can go ahead and power down.
10 10 08 17  CMP  Okay.
10 10 11 58  CC  Apollo 7, Houston. One minute LOS; Ascension at 32.

ASCENSION (REV 158)
10 10 33 07  CC  Apollo 7, Houston through Ascension. Standing by.
10 10 33 17  CMP  Roger. This is Apollo 7.
10 10 33 20  CC  Roger.

CANARY (REV 158)
10 10 37 33  CC  Apollo 7, Houston. When you get a chance, request onboard readout pyro A and B and batt C. No hurry.
10 10 37 45 CMP Okay. How much time to LOS?
10 10 37 58 CC I missed that. Say again.
10 10 38 02 CMP How much time to LOS?
10 10 38 13 CC Roger. About three and a half minutes.
10 10 38 48 CMP Pyro A is 36.9, and pyro B is 36.8.
10 10 38 54 CC Roger. Copy.
10 10 40 11 CC Thirty seconds LOS; Redstone at 38.

REDSTONE (REV 159)
10 11 39 04 CC Apollo 7, Houston through Redstone. Standing by.
10 11 39 13 CC Roger. Loud and clear, Donn.
10 11 40 45 CC Apollo 7, Houston.
10 11 40 54 CMP Roger. Go.
10 11 40 51 CC Roger. We understand you have a cabin soaked
with cold, and we don't feel the cabin cold soak
is necessary this time.
10 11 41 03 CMP Roger. I've got a CABIN TEMP of about 65 degrees
and SUIT TEMP of about 51. It's very comfortable
in here right now.
10 11 41 13 CC Roger.
10 11 41 23 CMP Speaking of cold soak and related things, we were
discussing putting the secondary water boiler ON
for entry and leaving the primary OFF. Has there
been any discussion of that down there?
10 11 41 37 CC Lots of it.
10 11 41 39 CMP Yes, I bet.
10 11 41 45  CC  We're still discussing, Donn.
10 11 41 48  CMP  Okay.
10 11 42 20  CC  Apollo 7, Houston. Opposite omni.
10 11 42 24  CMP  Roger.
10 11 48 17  CC  Apollo 7, Houston. One minute LOS.
10 11 48 21  CMP  Roger, Houston.
10 11 48 25  CC  Antigua at 59.
10 11 48 29  CMP  Roger. Fifty-nine for Antigua.

ANTIGUA (REV 159)

10 12 01 28  CC  Apollo 7, Houston through Antigua. A one-line flight plan update.
10 12 01 45  CMP  Go ahead, Ron.
10 12 01 47  CC  Roger. At 258 plus 30, oxygen fuel cell purge.
10 12 02 17  CC  Roger.

CANARY (REV 159)

10 12 10 15  CC  Apollo 7, Houston through Canary.
10 12 10 20  CMP  Roger. Good morning, Bill.
10 12 10 22  CC  Good morning and a pleasant last day to you.
10 12 10 27  CMP  Yeah, boy.
10 12 17 32  CC  Apollo 7, Houston. A little over half minute LOS Canary. S-band volume up and a 5 second for about two minutes until we get to Madrid.
10 12 17 45  CMP  Apollo 7. Roger.
MADRID (REV 159)

10 12 19 33 CC Apollo 7, Houston. Coming up on LOS. S-band volume up at 55 for Honeysuckle; Redstone at 13.

HONEYSUCKLE (REV 159)

10 12 58 42 CC Apollo 7, Houston through Honeysuckle.

REDSTONE (REV 159)

10 13 13 54 CC Apollo 7, Houston through Redstone. Standing by.
10 13 15 24 CC Apollo 7, Houston. Are you trying to call?
10 13 15 26 CMP Negative, Bill.
10 13 15 29 CC Okay.
10 13 23 34 CC Apollo 7, Houston. One minute to LOS Redstone; Antigua at 32.
10 13 23 44 CMP Roger.

ANTIGUA (REV 160)

10 13 33 57 CC Apollo 7, Houston through Ascension. Standing by.
10 13 34 02 CMP Roger, Bill.
10 13 34 04 CC That is Antigua.
10 13 34 29 CMP Bill, at what station pass do you expect the update for the retro maneuver?
10 13 34 35 CC Stand by, Donn.
10 13 34 47 CC Hey, Donn, it will be over Antigua the next pass; be about one hour and a half.
10 13 34 56 CMP Okay.
10 13 41 19 CC Apollo 7, Houston. One minute LOS Antigua; Canary at 44.
10 13 41 28 CMP Roger.
CANYARY (REV 160)

10 13 44 31 CC Apollo 7, Houston. AOS Canary.
10 13 50 37 CC Apollo 7, Houston. Opposite omni, please.
10 13 50 52 CMP Roger.
10 13 52 26 CC Roger. Apollo 7, Houston. One minute LOS Canary.
S-band up at 53, and we'll have Carnarvon at 21.
10 13 52 41 CMP Roger. Say again, Bill.
10 13 52 43 CC Roger. S-band volume up in about 1 minute for
the Madrid pass, and if no contact, we'll have
Carnarvon at 21.
10 13 52 52 CMP Oh, okay. Understand.

CARNARVON (REV 160)

10 14 21 13 CC Apollo 7, Houston through Carnarvon. Standing by.
10 14 21 27 CMP Roger. Houston, Apollo 7 here.
10 14 21 56 CC Roger.
10 14 24 51 CMP Houston, Apollo 7.
10 14 26 53 CC Apollo 7, Houston. Go.
10 14 26 56 CMP Bill, I'm just going to brief you for something
to do up here. Wally and Walt are still asleep.
I've got some of the spacecraft stowed - that
that I could get at without disturbing them - and
I'm going to be putting my suit on here pretty
shortly. At the beginning of the next night pass,
I'm going to try to get P51 accomplished so I can
get a leg up on the whole time line. That way,
when your update comes up later in the pass, if
there's time, I'd like to get P52 done, or I might wait until the next one.

10 14 25 27  CC  Okay. Right. We'll - we have the REFSMAT, NAV load, and the target load ready for the Antigua pass, and that will be at 08 past the hour.

10 14 25 42  CMP  Okay. Zero eight?

10 14 25 43  CC  Right.

10 14 25 45  CMP  Roger.

10 14 25 48  CC  So that will be ready and waiting if you - oh, that'll give you - let's see, that won't give you too much of that night pass actually.

10 14 26 00  CMP  I'd like to do the P51 before that, you see.

10 14 26 03  CC  Okay. If you could - if we could get through with that before 08, then we could get those three loads up to you and have that done and away with.

10 14 26 13  CMP  Yes, that's a good idea, Bill. Okay. Fine.

10 14 26 16  CC  Okay. Thank you.

10 14 26 18  CMP  I think we can get it all done but maybe the fine alignment before they get up.

10 14 26 22  CC  Okay.

10 14 27 10  CC  Apollo 7, Houston. One minute LOS Carnarvon; Honeysuckle in about 1 minute; turn your volume up.

10 14 27 20  CMP  Okay.
I 30 11 CC Apollo 7, Houston through Honeysuckle. Standing by.

10 14 30 19 CMP Roger. Read you.

10 14 30 21 CC Roger.

10 14 31 31 CC Apollo 7, Houston.

10 14 31 38 CMP Roger. Go, Bill.

10 14 31 40 CC Right. Donn, I have a little discussion here on a couple of items. I would like to make a couple of recommendations. First, for entry, we would like all three fuel cells on line. And secondly, we would like to operate the coolant loops primary without the evaporator secondary loop in bypass with the evaporator on.

10 14 32 15 CMP Roger. Understand. You want the fuel cells on, all three formed for entry?

10 14 32 19 CC Affirmative.

10 14 32 20 CMP And on the coolant, you want to run the primary system with the evaporator shut down? And on the secondary, bypassing the radiators with the secondary water boiler on it?

10 14 32 32 CC That's affirmative; and, of course, if the secondary evaporator quits, well, you can switch to primary evaporator and try it.

10 14 32 48 CMP Roger. Understand.

10 14 32 50 CC Okay.
10 14 32 52  
10 14 32 53  
10 14 34 16  
10 14 34 40  
10 14 35 01  
10 14 35 08  
10 14 35 09  
10 14 35 24  
10 14 35 26  
10 14 35 31  
10 14 35 34  
10 14 35 36  
10 14 35 38  
10 14 35 41  
10 14 35 44  
10 14 35 46  
10 14 35 48  
10 14 35 50  
10 14 35 52  
10 14 35 57  
10 14 35 58  
10 15 07 29  

**CMP**  
Thank you.  
Roger.  
Apollo 7, Houston. Opposite omni, please.  
Apollo 7, Houston. Opposite omni.  
Apollo 7, Houston. How do you read?  
Fine, Bill.  
Okay. One final item. This secondary radiator - we'd like to activate that at 258 hours.  
You're going to do what?  
I'm sorry - secondary evaporator at 258.  
Oh, okay. Secondary evaporator at 258 hours. Understand.  
Roger.  
I got it in my log here.  
Thank you. And we're coming up on 1 minute LOS Honeysuckle; we'll have Redstone at 50.  
Roger.  
**REDSTONE (REV 160)**  
Apollo 7, Houston through Redstone. Standing by.  
Apollo 7, Houston. No need to acknowledge. When you get around to it, opposite omni, please.  
Apollo 7, Houston. No need to acknowledge. One minute to LOS Redstone; MILA at 06; Antigua at 08.  
Okay, Bill.  
**MILA (REV 161)**  
Apollo 7, Houston through MILA. Standing by.
10150736 CMP Roger, Bill.
10150806 CMP Bill, you ready with the updates?
10150809 CC Say again, Donn.
10150811 CMP Are you ready with the updates?
10150816 CC Roger. We're ready if you're in ACCEPT.
10150824 CMP You've got it.
10150825 CC Thank you.
10150836 CC Donn, we're in a keyhole right now; it will be
coming up in a couple of minutes.
10150840 CMP Okay. I'm standing by for the maneuver PAD
whenever you have it.
10150851 CC Roger. Okay. I'll give it to you as soon as
I get it.
10150853 CMP Oh, you don't have it yet. I see, no sweat.
10150910 CC Apollo 7, Houston. I have maneuver PAD when
you're ready to copy.
10150914 CMP Okay. Go ahead.
10150933 CC Roger. 164 dash 1 Alfa; retrofire 259 39 1594
minus 02071 minus 00000 plus 02822 2350 minus
0260 03305 24010 minus 071 minus 13 012 30 3058
314 259 00 0000 minus 247 plus 06813 1561 180
180 000. Comments: sextant star not visible
after 259 plus 21. Another comment: backup
align stars are north set. I do have boresight
star information.
Roger. Let's skip the boresight information for now. Readback as follows: 164 dash 1 Alfa; 259 39 159 4 minus 02071 minus 06 all balls plus 02822 2 dash 0 minus 0260 02305 24010 minus 071 minus 134 20 12 30 58 314 259 00 0000 minus 2047 plus 06813 1561 180 180 and 0.

Roger. Check on a couple of them on NOON 42; apogee 2350, and in NOON 48 Y-trim 134.

Roger. That's what I got.

Readback is correct.

You've got a very loud squeal in your transmitter there.

Roger. Thank you.

ANTIGUA (REV 161)

Apollo 7, Houston.

Roger. Go, Bill.

Right, Donn. We could get the SCS line heaters to A/B.

Okay. You want the line heaters ON, right?

Right.

Roger. You got all the way down to 60 degrees.

Apollo 7, we have the REF Seam, NAV, and targets in; the computer is yours. One minute LOS Antigua; we'll have Canaries at 20.

Roger, Bill. Understand. I've got the computer back here. You're garbled, and you've got a very loud squeal there.
10 15 16 32 CC Okay. I'm checking on it.
10 15 16 33 CMP Your station or your transmitter is real bad.
10 15 16 37 CC Roger.

CANARY (REV 161)
10 15 22 28 CC Apollo 7, Houston. Would you go to BLOCK, please?
10 15 23 09 CC Apollo 7, Houston through Canary.
10 15 23 38 CC Apollo 7, Houston. If you read, go to BLOCK.
10 15 25 59 CC Apollo 7, Houston. Two and one half minutes
LOS Canary; we'd like BLOCK on the uplink when
you can get around to it, please.
10 15 27 01 CC Apollo 7, Houston. Did you call?
10 15 27 05 CMP Negative, Bill. I was just trying on my helmet
to see if it fits.
10 15 27 08 CC Okay. Would you go to BLOCK, please?
10 15 27 12 CMP Roger.
10 15 27 13 CC Thank you.
10 15 27 28 CMP Houston, Apollo 7. How do you read?
10 15 27 30 CC I read you five-square.
10 15 27 32 CMP Okay. Fine. I just had my other COMM helmet
on, and I just wanted to check it out.
10 15 27 36 CC Roger. About 1 minute to LOS Canaries; we'll
have Carnarvon at 55 and confirm going to BLOCK
now.
10 15 27 45 CMP Roger. We're in BLOCK now.
10 15 27 47 CC Thank you.
Apollo 7, Houston through Carnarvon.

Houston, Apollo 7. Did you call?

Roger. Apollo 7, Houston through Carnarvon.

Roger. We're up and at 'em here. I've got my lumpy suit on, and Walt and Wally are crashing around in the LEB getting something to eat.

Roger. Understand. And, Donn, in behalf of the gold team here in Mission Control, we wish to extend our congratulations to the crew and wish you every good wish for a nice soft landing, and we'll see you tomorrow.

Well, thank you, pardner. Thanks a lot for helping us out. Who's your flight director there?

Jerry Griffin.

Is Jerry there?

Jerry, air ground 2.

Yes, I'm here.

Hey, how you doing, buddy?

Fine.

Good. Sure appreciate all the fine help you gave us up here.

Well, thank you, and we're looking forward to seeing you when you get back to the ranch.

Yes, I'll say. We'll have to—right, Walt and Wally send their regards, Jerry, to you and all
the other fellows down there. They're not suited up yet and don't have their COMM on, so I'll just pass it along.

10 15 56 22  F  Okay. Thanks much, Donn.
10 15 56 24  CMP  See you later.
10 15 56 25  F  Roger.
10 15 56 28  CMP  You going off duty, Bill?
10 15 56 29  CC  Roger. I'm staying here, though. Jack will be talking with you now.
10 15 56 33  CMP  I see. Okay.
10 15 56 35  CC  I'll be watching you from here.
10 15 56 37  CC  Good morning, Donald.
10 15 56 38  CMP  Yes, I guess you would at that, wouldn't you?
10 15 56 40  CC  Good morning, Donn.
10 15 56 44  CMP  Hi, Jack.
10 15 59 09  CC  Apollo 7, Houston.
10 15 59 17  CMP  Roger, Jack.
10 15 59 19  CC  Donn, just so it doesn't startle you, you're getting close to a master alarm on fuel cell 2. It's the $T_{CH}$.
10 15 59 30  CMP  Okay. We were just talking about that up here. Walt's of the opinion that we ought to take that mother offline when it goes over limit and save it until later. What do you guys think?
10 15 59 43  CC  Okay. Stand by.
10 16 00 12  CC  Apollo 7, Houston.
Okay, Donn. On fuel cell 2, there's been a lot of discussion on that down here, and they feel that with the trends that they've seen that the $T_{CE}$ should top out about 185, and they would just as soon leave it on the line to keep from any switching transients there. And you shouldn't reach any higher than 185 at retrofire.

Okay. We're reading 181 right now.

Okay. That's about you're about 4 degrees higher than the actual there. Our value down here now is 177.

Okay.

Apollo 7, Houston. We're about 1 minute to Carnarvon. Do you want to turn S-band volume up? We'll pick up Honeysuckle for a long pass there.

Okay.

Honeysuckle (REV 161)

Apollo 7, Houston. One minute LOS Honeysuckle; we'll pick Guaymas at 36.

Texas (REV 161)

Apollo 7, Houston through Texas. Standing by.

Roger. Jack, how do you read our COMM here?

I read you five-by, Walt.

How's it going this morning?
<table>
<thead>
<tr>
<th>Time</th>
<th>Call Sign</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 16 37 57</td>
<td>CC</td>
<td>It's going very well. How's things with you?</td>
</tr>
<tr>
<td>10 16 38 00</td>
<td>IMP</td>
<td>Fine.</td>
</tr>
<tr>
<td>10 16 38 26</td>
<td>IMP</td>
<td>Are you there, and are you familiar with the fuel cell performance on yesterday's burn?</td>
</tr>
<tr>
<td>10 16 38 31</td>
<td>CC</td>
<td>Roger, Walt. I am.</td>
</tr>
<tr>
<td>10 16 38 34</td>
<td>IMP</td>
<td>Okay. I guess if it goes on up to 200 and we're in a retro countdown, I'm not going to sweat it anyway. I'm going to let it run on. I guess it seems to me if we went ahead and open-circuited here for the next hour and a half, we'd - maybe next 2 hours, a little longer, put it on around minus 30 or minus 45 minutes, we'd have little or no problem with it.</td>
</tr>
<tr>
<td>10 16 38 58</td>
<td>CC</td>
<td>Roger. I don't think from what we have been talking about that you'll have to worry. That is, we'll get up over 200; and if it does, we have been given the GO to let it go ahead and go over 200.</td>
</tr>
<tr>
<td>10 16 39 15</td>
<td>IMP</td>
<td>Roger. That's my intention.</td>
</tr>
<tr>
<td>10 16 39 17</td>
<td>CC</td>
<td>Okay. We concur.</td>
</tr>
<tr>
<td>10 16 39 23</td>
<td>IMP</td>
<td>It's a shame we can't get that one back and take a look at it.</td>
</tr>
<tr>
<td>10 16 39 26</td>
<td>CC</td>
<td>I agree.</td>
</tr>
<tr>
<td>10 16 39 35</td>
<td>CC</td>
<td>From all the data, we'll have a pretty good idea of what it is.</td>
</tr>
<tr>
<td>10 16 39 40</td>
<td>IMP</td>
<td>Very good.</td>
</tr>
</tbody>
</table>
Apollo 7, Houston.
Apollo 7, Houston.
Roger, Jack, go ahead.
Okay. Walt, at 258 here, when you activate the secondary loop, we'd like you to configure the suit heat exchanger for BYPASS on the primary loop and for FLOW on the secondary loop.
Already set up.
You're way ahead of me.
Apollo 7, Houston. We're 1 minute LOS Bermuda; we pick up the Canaries in about 3 minutes.
Roger, Jack.
Hey, Jack, give me 20 clicks on the water now.
Okay, Walt.
Apollo 7, Houston through the Canaries.
Roger, Jack, on the command module RCS temps, we are still reading 5 volts on all of them.
Okay. Real fine, Walt.
I'd like to bring you up to date on a canister change. We did that canister change 21 ... let me find it here. It was —
Okay. Walt, you got cut out there; copied canister change 21.
Yes, I looked for it; we put it off until we had
3 mm or something like that on the CO₂ partial
pressure. Anyhow, it is written down on the
DTO book, which I can't quite get at now. Hang
on a second.

Hey, Jack, at 245 hours and 56 minutes, we did
our last - put our last fresh canister in. And
in the next hour or so, we are going to recycle
number 1 back in.

Okay. Fine. Could you bring me up to date on -
We sure had a square unfilled there.

Okay. You're right.

Jack, we're actually two canisters short on this
flight.

Roger, Walt.

It seems impossible, doesn't it?

It kind of does. Could you bring me up to date
on the - how you're coming on stowage?

Roger. Stowage is all but complete. We took the
three biobelts and stowed them in the fecal can-
ister where we have been taking out the fresh fe-
cal bag. And we're going to be getting unsuited
on the water as soon as we get a chance on there,
assuming we all come out of this in a nice smooth
shape. And we have two temporary stowage bags up
with the coveralls in the temporary stowage bags.
Okay.

Everything else is stowed in its nominal place.

Okay. You got the gloves stowed and helmets on?

The helmets we don't have on. We're going to try the helmets. It's our general feeling now that we probably will not be wearing those helmets. We're going to make one more stab when we get the couch down to the launch position and see what we can do about clearing our ears. I'm probably in better shape than the other guys, and I'm not too sure about my ears. By the way Wally and Donn talked, they are in a little bit worse shape than I am. And if they go with their helmets off, that's the way I'll go, too. We don't want to get the suit loop too confused, as to which way it is supposed to act.

Okay.

There are a few items still left to be stowed and put in shape. That's like the data file, the temporary storage items, the F - Is there an F item, Donn? F1 and F2 still have a couple of small items then that we are going to have put back in the right place when Wally gets the couch. And he is about suited, and he will be on COM shortly.
Okay, Walt. How about the oxygen mask? Are they put away?

They are all stowed.

Okay.

Helms are - if we do not wear the helmets, the helmets will be tied down at the foot of the couch in front of each guy's couch. They will be below the level of the canisters down there. So it's out of the couch envelope.

Okay. We're not concerned about hurting the helmets. We're concerned about your heads.

Roger. We understand, Deke, and we're trying to make a go of it all the way with the helmets. We haven't gotten to the position where we can try them on in the couch in the boost position yet. However, we do feel that we have - if we go with the helmets off, we'll have pretty damned good protection set up around us.

I, we're about 1 minute LOS Canaries; we'll pick up Tananarive about 19.

Right. Good morning, Jack.

Houston, your -

Go ahead, Donn. You've taken the last Actifed at 257 here.

Talking about Actifed, we all took it.

Okay. Real fine.
10 17 02 58  CMP  We've still got our nausea pills left to take.
10 17 03 02  CC  Okay. The carrier reports wave height 1 foot out there.
10 17 03 07  CDR  That sounds almost good enough for the Air Force.
10 17 03 14  CMP  We thought a little bit of chop might break the landing just a little bit.
10 17 03 20  CMP  You can tell the carrier to watch out; we'll be coming down his stack.
10 17 03 29  CMP  What's the carrier call?
10 17 03 32  CC  Carrier call is Essex.
10 17 03 36  CMP  How could you ... 02?
10 17 03 42  CC  I'll be giving you a rundown on weather and call signs as we go a little bit further here.
10 17 03 49  CDR  Jack, do you read CDR?
10 17 03 51  CC  Roger. Five-by, Wally. We're just about to lose you.

TANANARIVE (REV 162)

10 17 19 58  CC  Apollo 7, Houston. One minute LOS Tananarive; we'll be coming to you at Carnarvon at 30 with an entry update.
10 17 20 09  CDR  Roger.

CARNARVON (REV 162)

10 17 30 19  CC  Apollo 7, Houston through Carnarvon.
10 17 30 53  CC  Apollo 7, Houston through Carnarvon.
10 17 30 58  EMP  Ready to copy entry update.
Okay. First, Walt, we'd like you to turn your \( \text{H}_2 \) heaters and fans on for both tanks to the ON position for a few minutes here so we can bump up the \( \text{H}_2 \) pressure.

Going now.

Okay. Then I'll give you the entry update.

Ready to copy.

Okay one -

Do you want fans and heaters ON?

Fans and heaters ON.

For hydrogen?

Hydrogen, right.

Fuel cell is still climbing, 18\(^{\circ}\) on my gage.

Yes, we're considering open circuit. We want to get a few data - a little bit of data flow here before we make any decision.

We'll take 10-degree flaps, too.

Roger. Okay. You ready on the entry update, Walt?

Read it.

Okay. 16\(^{\circ}\) dash I Alfa 190 000 042 000 10635 2595 16 plus 20 plus 2763 minus 06417 16 plus 19 minus 02846 55 slash 55 19 plus 22 17 plus 02 19 plus 58 24 plus 12 043 minus 18 slash plus 40.
Roger. Jack, readback follows: 164 dash 1 Able
190 000 042 000 10835 25954 16 20 plus 2763 minus
05417 16 49 minus 02846 55 55 19 22 17 02 19 58
24 12 043 minus 18 slash plus 4 zero. And I have
a question on your maneuver update remarks.

Okay. Stand by. Go ahead.

Roger. Down at the remarks is SCS 259, and I've
got written in here 21 on the PAD. Shouldn't
that probably be 41 if this is for SCS burn
backup?

That was for the sextant star not visible after
259 plus 21 plus 00?

Okay. Sextant star 259 plus 21. Thank you.

Okay.

And the entry update readback was correct?

Perfect.

Got to do something right.

Okay. Walt, we're recommending omni A for the
burn and omni C for post SEP.

Understand. Wilco.

And you'll be Simplex A for reentry, and -

That's affirmed.

And cabin fans, that's a crew option. You can
have no fans, one fan, or two fans. Your choice.

We'll have no fans; however, I am a little bit
interested in bringing on the secondary loops a
little sooner. The suit is a little bit warm.
Okay. Stand by.

Hey, Jack, on the maneuver PAD, the velocity counter setting is different from the - what showed up on the DSKY with the DELTA-V by 19.5 feet per second, I think, and you have DELTA-V tailoff at 19.

Okay. Stand by, Walt. We'll get a reading on that.

Okay. Walt, on your last question on the DELTA-V counter: that 19 feet a second is our value for the adjusted tailoff and what you should be reading in the DELTA-V counter after the burn is over.

I understand that, Jack, but the DELTA-V that you set on is generally different from the G&N reading by that tailoff amount.

Right. Okay. I guess I missed it, Walt. Why don't you go over it again? I guess I missed your question.

Okay. In doing P30, in one of the displays, it shows DELTA-V, and we set the DELTA-V counter to be equal to DELTA-V minus DELTA-V at tailoff. In this case, from your maneuver PAD, they were different by 19.5 feet per second, which would indicate that there was 19.5 feet per second tailoff. I commented on it at the time because
it seemed kind of large and now the DELTA-V at
tailoff on the entry PAD is 19.

Okay, Walt.

It's a small point, but I'd like to know which
is which in case I have to update my entry chart.

Okay. We'll discuss that. We're about 1 minute
LOS Carnarvon. You want to turn up S-band so we
can get Honeysuckle?

Okay.

Okay. Walt, on that question there, what has
happened is the DELTA-V tailoff coming out of
the CWC could be off by as much as 1 foot per
second because we didn't update it yesterday.
We chose not to do it because we felt it was
accurate enough.

Okay. Then I will update my entry chart based
on how it differs from 19 feet per second. Is
that correct?

That is correct.

Understand.

HONEYSUCKLE (REV 162)

Apollo 7. Opposite omni.

Apollo 7, Houston.

Go ahead, Chuck.

Okay. Wally, we'd like to have you turn the H₂
fans and heaters off now.
10 17 43 40  CDR  That's done; OFF not AUTO.
10 17 43 43  CC  Roger, OFF, O-F-F. And, Walt, we'd like to have
you open-circuit fuel cell 2; our plans are to
probably bring it back on line over the States.
10 17 43 55  CDR  Understand. Welcome to the club.
10 17 44 01  CC  Okay. We'd like to have you purge all fuel cells.
First, make an O₂ purge on all fuel cells before
the secondary loop activation.
10 17 44 12  LMP  Okay. I'll go ahead and purge them now so that
I can purge 2 before I take it off.
10 17 44 17  CC  Okay. We concur.
10 17 44 19  LMP  Roger.
10 17 45 11  CC  And, Walt, on your question on the secondary loop
activation: you can bring that loop online any
time after you've done the O₂ purge of the fuel
cells.
10 17 47 00  CC  Apollo 7, we're about 1 minute LOS Honeysuckle;
we pick up the Huntsville at 04.
10 17 47 09  CDR  Roger.
HUNTSVILLE (REV 162)
10 18 05 07  CC  Apollo 7, Houston through the Huntsville. Stand-
ing by.
10 18 05 12  CDR  Roger. Loud and clear.
10 18 05 15  CC  You're about three-by, Wally.
10 18 05 18  CDR  Roger.
10 18 05 32  Cr  Huntsville. I'm reading you five-by. I'm ready
       for lockup now.
10 18 08 50  CT  Huntsville LOS.
10 18 09 24  CT  Huntsville AOS.
10 18 09 50  CT  Huntsville LOS.

GUAYMAS through BERMUDA (REV 162)
10 18 11 45  CC  Apollo 7, opposite omni.
10 18 13 36  CC  Apollo 7, Houston.
10 18 13 41  CDR  Go ahead.
10 18 13 43  CC  Okay. Walt, we're ready to bring fuel cell 2
       back on the line.
10 18 13 50  LMP  It's been setting down; both buses have been
       down around 26.3 volts, Jack. It seems to me it
       would be a little safer if we waited another half
       hour or so to bring it on. What do you think?
10 18 14 11  CC  We're mulling it over here.
10 18 14 20  LMP  Fuel cells 2 and 3 are both heating up. They
       should be picking up. Well, we ought to go
       ahead and turn it on, I guess. We keep trig-
       ger ing the main bus undervoltage down there.
10 18 14 32  CC  Okay. We concur.
10 18 14 35  LMP  Okay. Incidentally, it started happening when
       I turned the secondary coolant loop pump on; it
       was just enough to pull it down.
10 18 14 42  CC  Roger. We were watching it.
10 18 14 55  LMP  It's back on the line.
CC 10 18 14 56  
Okay. We're watching it.

GUAJARAS through BERMUDA (REV 163)

CC 10 18 17 15  
Apollo 7, Houston.

CDR 10 18 17 18  
Go ahead.

CC 10 18 17 20  
Okay. Wally, generally how is your configuration, stowage configuration for reentry now?

CDR 10 18 17 26  
Okay. We're all stowed. We have the helmets stowed below our feet, and we're rigged up; we're not strapped in.

CC 10 18 17 34  
Okay. Are the O₂ masks stowed someplace where they might be accessible in case of RCS injection on the chutes?

CDR 10 18 17 44  
They are at the nominal point.

CC 10 18 17 47  
Okay.

CDR 10 18 17 50  
And tell everybody to stop wringing their hands. We're happy. We've practiced this quite a few times.

CC 10 18 18 04  
Okay.

CC 10 18 18 11  
Practiced what?

CC 10 18 19 16  
Apollo 7, Houston.

CDR 10 18 19 18  
Go ahead.

CC 10 18 19 19  
Okay. Walt and Wally and Con, I'll give you 104% dash weather. I'll update it. The weather is generally good; 1500 foot broken, 10 miles on the vis, winds are two ten at 15 knots, wave
height is 4 feet. You've got a carrier on station, three helicopters, and two rescue aircraft.

10 18 19 44 CDR And what's the carrier's call?
10 18 19 46 CC Essex.
10 18 19 49 CDR They have a call, Jack, in lieu of a name.
10 18 19 53 CC Stand by, Wally.
10 18 20 00 CDR Roger. Like we are Apollo 7, they are - they can put names on them.
10 18 20 07 CC Okay. Stand by.
10 18 20 25 CC Okay. Wally, the call sign for the carrier is just the Essex. Your rescue aircraft are Kenby Rescue 1 and Kenby Rescue 2, and the helicopters are Recovery 1, 2, and 3.

10 18 20 42 CDR Very good.
10 18 20 43 CC And I'll give you an update on the weather farther along.
10 18 20 50 CDR It's a special case if the carrier is using her name.
10 18 20 56 CC Roger.
10 18 21 58 CDR Jack, you read?
10 18 22 00 CC Go ahead, Wally.
10 18 22 02 CDR I might add we all feel very good and chipper up here. We all got a lot of good sleep; we're well hydrated and had a lot of food, so there's not much more to do and let the computer work for us.
Okay. I think we're all the same down here.

Very good.

Houston, Apollo 7.

Go ahead, Wally.

Are we over the recovery force now?

Just about, Wally.

We heard a call sign, Lucky Strike.

Okay. Wally, we got you for another 4 and 1/2 minutes here.

Very good. We aren't having any luck with the sextant star yet; it's been behind the earth. We'll try a daylight pass; and up to about retro minus 40 minutes, we'll give it a go. After that, we'll have to forget it.

Okay.

Apollo 7, Houston.

Go ahead, Deke.

Roger. Did you conclude you could not get helmets on? Is that the problem?

No, we can get them on; we can't get them off.

Okay. But the mode we wanted was to have them on without being latched down to the neckring.

Deke, I can't get my hand in there, besides a handkerchief, and we're not at all safely braced for landing. We'll evaluate as carefully as we can.
Okay. I think you ought to clearly understand that there is absolutely no experience at all with landing without the helmet on.

And there is no experience with the helmet either on that one.

That one we've got a lot of experience with, yes.

If we had an open visor, I might go along with that.

Okay. I guess you better be prepared to discuss in some detail when we land why we haven't got them on. I think you're too late now to do much about it.

That's affirmative. I don't think anybody down there has worn the helmets as much as we have.

Yes.

We tried them on this morning.

Understand that. The only thing we're concerned about is the landing. We couldn't care less about the reentry. But it's your neck, and I hope you don't break it.

Thank you, babe.

Over and out.

Say again.

Houston out.

7, we're about 1 minute LOS Bermuda; we pick up the Canaries at 33.
Roger, Jack.

**CANARY (REV 163)**

Apollo 7, Houston through the Canaries. Standing by.

Roger, Jack.

Apollo 7, Houston.

Go ahead, Houston.

Okay. Walt, you can turn the SPS line heaters off now. We're showing a VALVE TEMP of 60 which is okay.

Roger. Turn them off.

Houston, this is Apollo 7. I'll be prepared to talk about the whole mission when we get back.

Roger, Wally.

7, we're about 1 minute LOS Canaries; we'll pick up Tananarive at 51.

Roger. We changed canister number 1 and put it back in.

Okay. Copy that.

**TANANARIVE (REV 163)**

Apollo 7, Houston through Tananarive. Standing by.

Roger.

Houston, Apollo 7. Do you read through Tananarive? Over.

Roger. Walt, we're reading about four-by.
Okay. We'll come up over Carnarvon. We have SECS LOGIC down; we're standing by for a pyro ARM; and I assume that you'll insure that we leave Carnarvon with a clean tape for reentry, and if you don't, would you let me know so I can COMMAND RESET and get it going before we deorbit?

Okay. Will do.

Apollo 7, Houston.

Go ahead, Jack.

Okay. Walt, we didn't see you initiate the DAP for the VERB 46 there.

I did initiate the DAP.

Okay. That's all we wanted.

Chute or what? Send another one. I went to DAP right after P30 instead of VERB 46. I'm checking.

Okay. We just didn't see it and wanted to confirm.

That's good, but it has been set.

Roger.

Apollo 7, we're 1 minute LOS Tananarive; Carnarvon at 06.

CARNARVON (REV 163)

Apollo 7, Houston through Carnarvon. Standing by.

Roger. Are we GO for pyro?

Stand by. We want to look at it here.
Roger.

Apollo 7, you are GO for a pyro ARM.

Thank you, Jack.

Pyro ARM.

Pyro A ON, pyro B ON.

One ON and two ON.

That's kind of a lot of fun to hear that.

Roger. We've pressurized our command module RCS.
We seem to have had a chattering regulator for awhile.

Roger.

She's in compression.

Houston, Apollo 7.

Go ahead, 7.

Did you ever hear a Model A on a cold day?
That's what it sounded like.

Roger.

We could hear it go through the lines. We're happy with the CM RCS.

Roger.

Houston, Apollo 7. Do you monitor our helium pressures on rings 1 and 2?

Affirmative.

Roger. We're reading 35; checklist calls for 4000.

It looks like it may be warming up.
Do you concur with the 4000 figure in the checklist, Houston?

Affirmative. We're watching it here; we'll let you know.

Roger. Okay.

We don't have a pump on the end, so we'll use what we've got.

Apollo 7, Houston.

Go ahead, Jack.

Stand by one.

Apollo 7, Houston.

Go ahead.

Donn, our telemetry here shows that the RCS DAP has not been initiated.

Okay. We'll do it again.

Okay.

Okay. We'll check your telemetry out.

Roger.

What does that look like?

Stand by.

Okay, 7. We show it now running.

Very good. The call was worth it.

Roger.

We did initiate that before. I was quite surprised.

Roger.
Apollo 7, the DSE is yours; it's clean.

Roger. Thank you. Would you people initiate expulsion prior to deorbit burn?

Okay. Walt, you'll need to hit high bit rate and up telemetry to COMMAND RESET at that time.

Okay. We'll do it then, and we'll do it 30 seconds prior to the burn.

Roger. That's fine.

Apollo 7, we're about 2 minutes LOS Carnarvon. You want to turn up S-band for Honeysuckle?

Wilco.

HONEYSUCKLE (REV 163)

Apollo 7, we're about 2 minutes Tanararive; we pick up Hawaii at 33. I mean Honeysuckle.

HAWAII through BERMUDA (REV 163)

Apollo 7, Houston through Hawaii.

... 

Okay. Direct RCS ON.

Check with Ron, Wally.

Apollo 7, Houston through Hawaii.

Roger. Just completed gimbal drive check.

... three. Verify RATE COMMAND.

Let's verify where the trim ended up.

It looks good.

Okay. RMAG mode 3.
Okay. Three of them, right? One, two, one, two, and three.

Okay. We're standing by for 2 minutes.
I'll give you a time back at 2 minutes.

Roger.

Okay. A final —

Thanks for the long hours of support, Jack.

Okay. It's been real fine, Walt. Just a final update on the weather in the recovery area:
2000 broken, winds 270 at 20, wave height at 3 feet.

Roger.

Nine, eight, seven, six, five, four, three, two, one.

MARK.

T minus 2 minutes.

We're with you, Daddy.

FDAT scale five-five.

Five five.

DELTA-V thrust A and B NORMAL.

Handcontrollers ARMED.

ARMED.

Number 1 ARMED.

Okay. Standing by for up telemetry COMMAND RESET. I'll get that at 45 seconds.

Sixty seconds.
Up telemetry is going to COMMAND RESET.

Thirty seconds. EMS DELTA-V in AUTO.

DELTA-V in AUTO.

Flight qual recorder ON.

Recorder's ON.

PIPA's are counting.

Four-jet ullage, 15 seconds.

Roger.

Fifteen seconds.

Roger. And DELTA-V's counting.

Ten, nine, eight, seven, six, five, four, three, two, one.

CDR&CC RETROFIRE.

And we're right on the mark.

Cutoff very good.

Gimbal's coming OFF.

There's your residual.

Turn four channel ON.

Copy residual.

And, Walt, one last reminder: turn S-band volume up before seven.

Roger.

19.8 on the DELTA-V counter for the residual.

Copy that.

We burned residuals to one-tenth.

Roger.
10 19 40 16  LMP  DELTA-V thrust A and B OFF.
10 19 40 19  CMP  Spacecraft control to SCS.
10 19 40 21  CDR  SCS.
10 19 40 22  LMP  Gimbal motors are OFF. Circuit breakers. Gimbal
motor control, four OPEN.
10 19 40 28  CDR  Four OPEN.
10 19 40 28  LMP  TVC servo power, one and two OFF.
10 19 40 31  CDR  One and two OFF.
10 19 40 34  LMP  Rotation handcontroller number 1 locked, Donn.
10 19 40 38  CMP  Controller locked.
10 19 40 40  LMP  EMS mode. Stand by; I've logged the residuals.
10 19 40 43  CDR  Okay. 99.
10 19 40 47  CC  Okay. That's good. It was.
10 19 41 01  CDR  Let's move out.
10 19 40 59  CC  Call program 61.
10 19 41 08  CDR  You've got the rate 49-20.
10 19 41 18  LMP  Primary glycol to radiator pulled, Wally.
10 19 41 22  CDR  Mighty big handle. PLSS is pulled, babe.
10 19 41 26  LMP  Okay. PLSS valve ON.
10 19 41 28  CMP  PLSS ON.
10 19 41 36  LMP  Oxygen service module supply valve OFF, and you
could be yawing 4½ feet out of plane, Wally.
10 19 42 13  CDR  Okay. Service mode supply valve OFF.
10 19 43 11  CC  Roger. LOE. Lost signal downlink.
10 19 45 34  CMP  B and D; the roll, pitch, and yaw to channel A.
10 19 45 53  CC  Apollo 7, Houston. We're back with you.
10 19 45 56 CDR Reading you five-square, Jack. Everything came out hunky-dory.
10 19 45 59 CC Okay. We lost you there for about 2 minutes.
10 19 46 03 IMP Standing by for a postburn update.
10 19 46 05 CC Okay.
10 19 46 10 IMP We had two main bus A and two main bus B under-voltage at SEP, and we got all three batteries OK. There is nothing more we can do; we are reading 25.2 volts.
10 19 46 19 CC Copy that.
10 19 47 04 CDR 259 54.
10 19 47 52 CC 7, we'll have the postburn PAD for you in about 2 minutes.
10 19 47 58 CDR Everything's working beautifully, Jack.
10 19 48 00 CC Right. You're looking good. You're coming right down the line.
10 19 48 03 CDR It's a slap in the face when we separate.
10 19 48 05 CC Roger.

HAWAII through BERMUDA (REV 16b)
10 19 52 00 CC Apollo 7, Houston.
10 19 52 02 CDR Ready to copy.
10 19 52 04 CC Roger. Go with the preburn PAD. You were that close.
10 19 52 07 CDR Thank you.
10 19 52 08 IMP How about that?
You're looking real good, Wally. Coming right down the line.

Roger, Ron.

We're on ring A, and she's a really nice control system.

Roger. Copy that.

You're still looking good, 7.

Roger. We're flying a pink cloud.

Good.

Apollo 7, Houston.

Apollo 7, Houston. Standing by.

Apollo 7, Houston. Standing by.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Apollo 7, Houston.

Aria 4 (REV 16b)

Aria 4. Go REMOTE.

Aria 4. Going REMOTE.

Apollo 7, Houston.

Apollo 7, Houston through ARIA.

Apollo 7, Houston.
10 20 08 01 CC Apollo 7, Houston.
10 20 08 21 CC Apollo 7, Houston.
10 20 10 09 CC Apollo 7, Houston.
10 20 16 05 CT ... up to about 40 dB when we have it, but we have been unable to AUTO track it.
10 20 19 07 CT Okay. COM TECH, ARIA 4.
10 20 20 34 CC We still have --
10 20 22 06 CC Roger. Out.
RECOVERY 3 (REV 164)
10 20 30 01 R-3 This is Recovery 3. We are on top of the command module at this time on these online coordinates 11537.
10 20 30 12 CDR Recovery 3, this is Apollo 7.
10 20 30 13 R-3 Roger, Apollo 7. ... coordinates ... 33. We have a little communications with Apollo 7 at this time. Conditions appear normal. The command module is moving into a stable I position. We have maneuvered to commence frogman deployment.
10 20 30 39 CDR Recovery 3, as soon as you attach the flotation ring, we will deploy the grappling hook.
10 20 30 53 CDR Apollo 7 here, Recovery 3.
10 20 31 00 R-3 Apollo 7, this is Recovery 3. Go ahead.
10 20 31 03 CDR Roger. Please inform us if deployment is required of the grappling hook.
Apollo 7, this is Recovery 3. We are in the process of making our ... ; we will have backoff without voice communications. Over.

We understand that; and if you want the grappling hook, give us a little lead time; we'll be standing by. Over.

Essex, this is Recovery 3. All prelifting ... have been complied with, flotation collar affixed, and I am presently approaching the command module.

Roger.

Essex, this is Recovery 3 by ... 1186.5.

Roger.

Apollo 7, this is Recovery 3. Over.

Go ahead, Recovery 3.

Apollo 7, go ahead.

Go ahead, Recovery 3. ...

This is Recovery 3. As soon as our frogmen complete installing the flotation gear, everything is functioning normal. The command module appears ... bluish on one side and a yellowish color.

This is Air Boss on station on recovery of the command module ... This is Air Boss. The command module is in stable I position, floating very nicely. The
three uprighting bags are fully inflated. One swimmer is installing the flotation collar. One swimmer is now attaching the sea anchor; the other two swimmers are now attaching the flotation collar; the beacon has already been attached. The collar is now approximately one-third attached. There has been very slight scorching on approximately one-third of the area of the command module. The rest is ...

AIR BOSS

Apollo 7, Air Boss. Over.
Go ahead, Boss.
Roger.

Very good. Our Air Force type had a little bit of nausea, but is none the worse off.
Roger.

Essex, Essex, this is Air Boss. Over.
Roger. This is Essex.
Roger. The astronauts report they are all very, very good. Over.
Roger.

Command module has no apparent damage to it at this point. The collar is now about to be attached; the two ends are now being joined by the swimmers in the water.

Roger.
There is no apparent sea dye in the water at this time that we can see. The inflation's about to begin.

The rotating beacon does not appear to be working at this time; however, the antennas - the two VHF antennas are erected. The swimmers are making the final check on the collar prior to inflation. The third swimmer is below the command module proceeding to take pictures. The rotating beacon is now operating. The two VHF antennas are extended. The three flotation bags are inflated, and photo 1 is now entering the area.

Photo 1 -

Air Boss to Apollo 7 commander. Do you see the lights, now? I didn't have the switch on.

Stand by. 7.

Roger. Checklist for verification.

Roger. Stand by. This is Air Boss. We have the beacon, and it is now operating properly.

Well, good! Just takes a little bit of switchmanship, I guess.

Stand by.

The procedures now - our cell has not been inflated ... appears to be no trouble at this
time. The swimmers are just making final check. It's inflating and secure.

10 20 36 48 AB The collar is now starting its inflation. It is one-third inflated at this time. All appears to be normal.

10 20 37 04 AB This is Air Boss standing by about 5 miles away. Five miles. The command module bears 130 magnetic, 5 miles from your position at this time.

10 20 37 17 E Essex. Roger. The flotation collar is now fully inflated. The swimmers are checking around the command module to assure that all the attachments are complete.

10 20 37 42 CDR Air Boss, Apollo 7. We're in good shape. We're going to go off COMM for about 4 or 5 minutes.

10 20 37 48 AB Roger. We'll just be orbiting up here in place.

10 20 37 51 SC Okay.

10 20 37 57 AB Essex, this is Air Boss. Apollo 7 is going off COMM now for about 5 minutes. . . .

10 20 37 59 E Essex. Roger.

10 20 38 24 R-3 Essex, this is Recovery 3. We did not recover the three main chutes nor do we have them in sight at this time. Over.

10 20 38 33 E Essex. Roger.

10 20 38 43 AB This is Air Boss. I now have Essex in sight; it is about 4 miles away bearing 125. The .3
... The swimmer is now attaching the retriever in position ...

10 20 39 16  E  Air Boss, this is Essex. Over. We Roger.
10 20 39 23  AB  Essex, this is Air Boss. ... main chute down ...
... about 20 yards. ...