

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	1. Unexplained MC+W (T-31.5 HRS)		
	2. CM RCS leak - a loose transducer was found and this is strongly suspected to be the source of the leak. The loose transducer was in the He manifold in ring 1. (See later comments)		
	3. Low voltage on one SLV Battery 32 vice 36. Standing by to replace -		
	4. Flange bearing temp on SLV reading -40°		
	5. FC1 O ₂ flow transducer looks bad		
	6. DPS fuel loaded to 46 lbs less than planned		
	[2. Continued] - CM RCS Fu & O ₂ Press was checked down stream of the Rd Check Valves. Fu showed 33 psi, O ₂ showed 40 psi. There is some suspect of the meters used to check the fuel, but it now appears that the transducer may not have been the leak point.		

E Memory locations that will not clock

2633 — 06316

2634 — 02302

L.A.
(72.025 deg)

AV - P - BT - Ha
2012 - 5 $\frac{1}{2}$ hrs - 2000 M²
2113 - 4 $\frac{3}{4}$ hrs - 1650
2240 - 4 hrs - 1300

FLIGHT DIR MISSION LOG	DAY	REV	PG
			1
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
T-24	Console Manned		
	E Memory locations that will not check		
	location 2633 - should be 06316		
	" 2634 - " " 02302		
	Launch Az = 72.028 deg		
-22:40	Performing CMC clock align.		
	Completed by 22:00		
-22:28	LV CMD Decoder ON for CCS		
	Checks		
-22:05	CCS S-BD Carrier is ON		
-21:56	E Memory loaded		
-21:50	EMOD Complete		
-20:30	CM Ring 1 MNFLD Press down to		
	15 PSI due to sample taking		
-20:10	Start EDS test		
	Eng 5 + 2 blinked as		
	in previous tests		
-19:20	LV CMD CHECKS COMPLETE		
	MILA SAFED		
-18:30	SHE Top Off Completed		
	No problems.		

CSM SYSTEMS

GNC SUMMARY TO FLT DIR
T-24 TO T-19

- ① AT T-31:46 HAD AN MC & W WHICH KSC FEELS IS ASSOCIATED WITH THE GN. SPAN IS CHASING THIS AND WILL REPORT BACK.
- ② OVER A PERIOD OF TWO DAYS, CMRCS RING #1 MANIFOLD PRESSURE DROPPED APPROX 8 PSI (43 TO 35). THE FIRST SUSPECT WAS PRESSURE TRANSDUCER SEAL LEAK. DECIDED TO RETORQUE TRANSDUCERS. HOWEVER, WHEN THEY CHECKED FUEL & OX LINE PRESSURES BELOW THE RESPECTIVE CHECK VALVES, OX WAS 47 PSIA AND FUEL WAS 33 PSIA. (WHICH COMPARES TO 35 PSIA AT THE MANIFOLD). THIS OPENS THE POSSIBILITY OF A FUEL LINE LEAK BELOW THE FUEL CHECK VALVES. KSC STILL TESTING.

S. Conin
5/17/69

MISSION NOTES

LM FUNNIES —

① APS FUEL AND OX TANK BLANKET PRESSURES WERE LOADED REVERSE. THE OX PRESSURE OF 178 PSI @ 72°F IS ABOVE THE LAUNCH REDLINE OF 166 PSI, THIS APS PRESSURE HAS BE WAVED.

② THE DPS FUEL WAS LOADED 45.7# SHY OF THE TARGET VALUE. THE PRESENT FUEL PRESSURE OF 189 PSI @ 72°F IS ABOVE THE LAUNCH REDLINE OF 182 PSI. THIS PRESSURE IS OKAY—THIS IS THE PRESSURE THAT THE TANKS WERE LOADED TO DUE TO THE 45.7# SHY. THE LOADING CURVE IS ATTACHED. THIS 45.7# IS EQUIVALENT TO APPROX ~~1.8~~ SEC OF DPS BURN @ FTP.
3.8

Hal Lodon

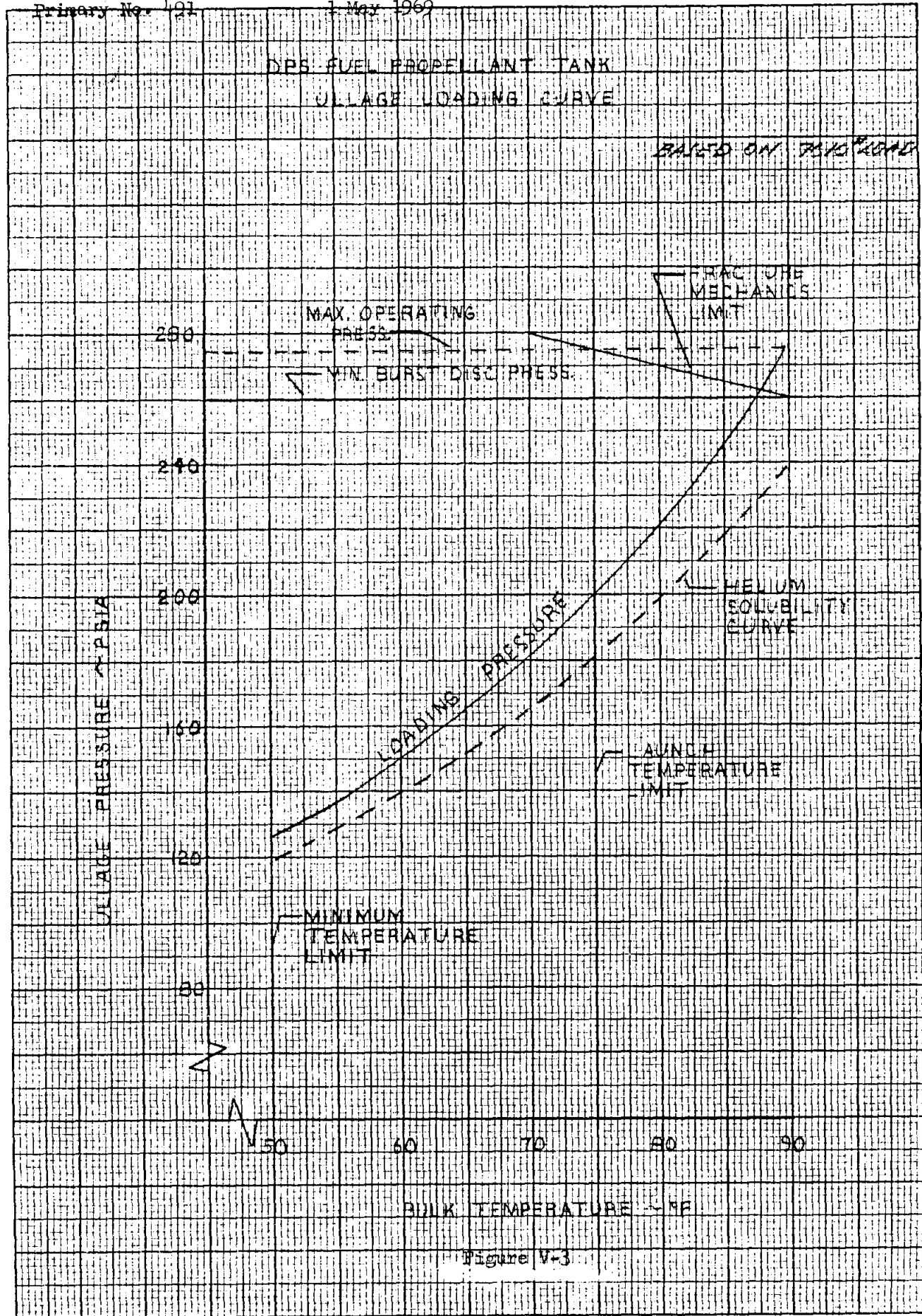


Figure V-3

FLIGHT DIR MISSION LOG	DAY	REV	PG 1
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
L-10:15	T-9 and holding - GO to CVTS to		
	pickup count. (CVTS is "DON")		
L-10:00	Resumed Count		
T-9:00			
	Surface γ 120° / 14 KTS to 19 KTS		
	WINDS		
T-08:20	Lost ONE OF TWO SITES AT		
	MADRID - ETO 0800 GMT		
	GO FOR LN TANKING		
T-08:10	Pred horizontal loading velocity = 32 fps		
	T-9.5hrs P = 222		
	T-8hr balloon is being tracked		
T-7:55	L/V shading started		
T-7:17	MILA ARMED, Ready for		
	FT47		
T-7:10	Waived the requirement to test the		
	RTG cooling during Countdown. The		
	GSE duct piled/ ad is not supplying		
	cooling air to the "dummy" RTG "		
T-7:07	Start FT-47		
T-7:02	Complete - Could not verify Nav		
	update but this was expected		

L/V funnies

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	GSE PNEUMATIC REGULATOR		
	ON S-II SUPPLY FAULTED		
	APPEARS THAT A READJUSTMENT		
	SOLVED THE PROBLEM - WILL		
	BE MONITORED AT KSC		
	LOST PRIME LOX PUMP AT		
	LOX FACILITY - WENT TO		
	BACKUP PUMP - RESUMED		
	CHILL FOR LOX LOADING		
	APPARENTLY LOST INDICATION		
	OF GSE ENVIRONMENTAL		
	CONDITIONING ^{FLOW} TO IW/WR AREA		
	(FORWARD SKIRT UMBILICAL)		
	TEMPERATURES WERE HOLDING		
	CKED & RESUMED FLOW -		
	STILL AN OPEN PROBLEM.		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
T-7:00	MILA Safed		
T-6:50	Started S-IVB LOX loading		
	CVTS estimates we have used up about 50 minutes of the 1 hour hold already. The LOX loading was delayed due to Pre Pump failure. Now using backup pump.		
-6:42	25% LOX UNBD		
-6:40	ENTIRE NETWORK IS GREEN		
-6:19	S-IVB LOX loading complete Proceeding with S-II LOX fill		
-6:00	Predicted horizontal impact speed is 37 fps (P=.199) based on 0900Z winds.		
	* H ₂ heaters activate at 1 psi above the C&W trip limits		
	GMT	L.A	} Launch Window
	16:49	72.03	
	17:49	77.99	
	18:49	83.99	
	19:49	91.07	
	20:49	101.85	
-5:45	S-II LOX load complete		
-5:08	Passed SPS Thumbwheel trim settings of P = -1.54, Y = +1.32		

Close A Isol Valves

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		613
18/0500Z	CAN IN ON STR. T-9HR & HOLDING.		5/8
	SPAN SUMMARY CHRCS :		
	① RING # 1		
	KSC SUSPECTS PIN-HOLE LEAK		
	DOWNSTREAM OF FUEL CHECK VALVE.		
	THEY ARE CERTAIN IT IS HELIUM		
	NOT FUEL. THEY PREDICT ANOTHER		
	PCM COUNT DROP PRIOR TO LUNCH.		
	ARNIE PURSUING A PREDICTED		
	MISSION LEAK RATE. M/R 18-21 A		
	WILL BE WRIVED. DONT EXPECT		
	FURTHER DAMAGE AT LEAK POINT		
	WHEN SYSTEM IS PRESSURIZED.		
	② RING # 2		
	WHEN PROP ISOL VALVES OPENED PER		
	TCP, THR OXID BURST DISC		
	HAD ALREADY RUPTURED. WE NOW HAVE		
	OXID AT THE ENGINE. M/R		
	18-22 WILL BE WRIVED. THE		
	MANIF PRESS DROPPED FROM		
	44 TO 35 PSI IN 2 SEC		
	WHEN THE PROP ISOL VALVES		
	WERE OPENED.		

FLIGHT DIR MISSION LOG	DAY	REV	PG
TE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	③ PROPOSED CONFIG CHANGES		
	A. OPEN CMRCS HEATER CB'S		
	PRELAUNCH		
	B. DO NOT CLOSE PROP ISOL		
	VALVES POST-INSERTION, TO		
	PROTECT AGAINST THERMAL		
	EXPANSION. FLY WITH BOTH		
	RINGS ISOL VALVES OPEN TO		
	SIMPLIFY MATTERS.		
	C. IF MANIF PRESS DROPS, CLOSE		
	PROP ISOL VALVES. THEN START		
	FROM THERE.		
	D. SPAN DOESN'T ^{THINK} HEATING WILL BE		
	REQUIRED. ALTHOUGH IT CAN BE		
	DONE, IT IS NOT DESIRABLE.		
	④ IF RING #2 BURST DISC IS PARTIALLY		
	RUPTURED, WE MAY RESTRICTED		
	FLOW AT SYSTEM ACTIVATION.		
	ANALYSIS HAS SHOWN THAT THE		
	DISC IS FULLY RUPTURED. (??)		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<p>(5) AT LAST TEST, THE VALVES AND ENGINES HAD ZERO LEAKAGE.</p>		
	<p>(6) ARNIE REPORTS THAT RING #1 LEAK RATE IS: .133 PSI/HR AT GROUND LEVEL THEN INCREASES 20% IN FLIGHT. IN FLIGHT LEAK RATE = .16 LBS/HR</p>		
	<p>(7) FURTHER RING #2 DATA: IF MANIF PRESS DROPS 3 PCIN COUNTS IN 6 HRS, WE ARE LEAKING OXID THRU ENGINE. CLOSE PROP ISOL VALVES. NO THERMAL EXPANSION PROBLEM AT THIS LEAK RATE.</p>		
10/07002	<p>I'M STARTING PLOTS ON CURVES MANIF PRESS BOTH RINGS. BETTER START WORK ON CREW CHECKLIST PROPOSED CHANGES.</p>		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
-4:47	Network seq. 274 completed 0		
-4:40	The B CP had a "memory fault"		
-4:35	CRO TM Computer is down "Red" can support		
-4:28	Verify E-Memory Load JJ		
-4:25	Data flow on trajectory run was go		
-4:21	5-1C FOX loading complete		
-4:02	Completed E-Memory loading		
-4:00	Estimate 11 minutes of hold time left 0		
-4:07	Predicted horizontal impact velocity is 41 fps, $P = .25$ (Wind at 12/152)		
	Launch window for today is GMT=20:24, LA=96°		
-3:37	S#4 LH2 loaded to 100%		
-3:30	Pick Up Count		
-3:12	*CRO TM CMPTR Down-		

MISSION NOTES

EBCOM 13+372

The loss of FC 1 O₂ Flow XDCR precludes verification of the termination of a FC 1 O₂ purge both onboard and ground. It may be wise to remind the crew that it'll be important to make sure of proper switch position after purge termination.

each flc

SLZ

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		
	③ P. Thule		
	L/4-1		
	Post } 150k. B System - Open Insertion } A System - Close		
2:30	Voice checks GO ✓		
2:20	Abort checks -		
	Discussion re APD w/ Lower RCS config - Following end checks -		
1:59	Coplanis checking w/ Stacey - re hot new procedure -		
	Leave CM prop isol open at insertion		
	Door later at P5 2 Time - Use heater switch on #2 side to bleed off residual gas -		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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	BSE - All set -
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	REGRO - Azimuth limits on Mode 2 -
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	$\rho - 1.05$
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	$g. + 1.3$
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	<u>FIR</u> - good slope
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	<u>GOID</u> - Azimuth for STC -
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	+07203 -
--	----------

	0 028 loaded -
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	<u>GAC</u> - CB being worked w/ STC/age -
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1-52	Engine #4 out - not normal -
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	#2 out - not sure if normal -
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	<u>normal</u> -
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	<u>Surgen</u> - all good
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	Water in log -
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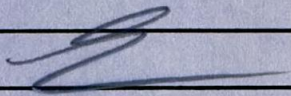
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FLU-17

MISSION NOTES

CP DETOG CONFIRMED THAT YOU
MUST HAVE STARDED THE COMMAND
SWITCH IN THE WRONG DIRECTION
THEN CAME BACK THROUGH NEUTRAL
A LITTLE TOO FAST.

PROBABLY JUST TWITCHED A LITTLE
WHEN YOU PULLED IT OUT OF DETENT.



SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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Redunk-

① CRO T Muptr down - 15 30 Z ETC -
 Consuit -

Recy - little problem in weather at
 target points -
 changing target points
 1/0 -

More 770 all in Pacific

Capt & Sup -

5618

BSE - #2 lit out - AKA -

CC - crew does not want to activate
 heaters -
 Got this by monitoring private dis was

1-31 - EDS -

FLIGHT DIR MISSION LOG	DAY	REV	PG (8)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<u>1:25</u>	CC-Verify		
	CB- polygons -		
1:20	- LV ends - OK -		
	Talked to CDR -		
	we want to prep isol -		
	will do at 152 Time in LEB.		
<u>T-38</u>	- Status GO ✓		
	2441		
	Status GO -		
T-07	GO -		
	Living Azimuth within -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (9)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	IVIS prep work -		
	SIC "		
	KATTS - on GO -		
	Int in par -		
	23 - SIC complete -		
	GRK -		
	IGN - 4/8 -		
	clark yaw		
	Go on JP -		
	board -		
	60 - JSSF -		
	Patch track -		
	Roll complete 6/5 -		
	SIC -		
	IB -		
	moving around -		
	Cabin cleaning		
	29's -		
	1420 - 60 -		
	180 gear -		
	249's -		
	Coffee making -		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

2000

EP5 off -

2+41 -

SD -

60 -

Thrust 60 -

PAO -

Carriage -

del jet -

fuel met -

6.0

6.0 water Eng -

4+30 - 60

0+15

9+11

5 - 120 60

5730 - All 60 -

6 -

Control Motors -

FLIGHT DIR MISSION LOG	DAY	REV	PG (11)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	8fps out of plane - 3fps out of jet in plane		
	6+40 - 1 vs Rocket -		
	7- 8+15 all ok		
	<u>9+17</u>		
	<u>7+40</u> - TASCOL		
	all looks good -		
	ride front seat		
	B PARD - GOOD -		
	PUSHIFT		
	LSA		
	9 - Golf a spraying -		
	ride 4 -		
	spraying -		
	500		
	51005		
	aid int -		

12

20180 Q/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

F180L

10- 60L
outward good -

pred d^o 11+747. ✓

10+50
Shwin -

11- all 60L
11:10 all good -

and tented -

11445 and -

SFCOL

102. 6x101 -

25, 566
- 10 4 -

13

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

13 - large softy news

closed for maintenance
no one -

interest see log -

closed isolon #1
#2 open -

unfry for about

1037101.

Keep for maintenance closed for
15 min ✓

no one in - ✓

FLIGHT DIR MISSION LOG	DAY	REV	PG (14)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Nepuk		
	Men CPP - No kraj photo -		
CY2	Review heater procedure -		
	Fantastic -		
	- .11 - 152 optimal		
	✓ If helmets sufficient then solve -		
	Going to it -		
	See Eng looks good -		
CY2	GET IT -		
	1.6 seconds longer than previous -		
	Within the previous - should		
	be OK -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (15)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	HePunkh -		
	Mer CAP - HoTraj - ETO 17:30Z		
	1 Capt V at CAP		
	ETO - 17:30Z		
	Mode A - all		
	3 fps in plane		
	16 fps out of plane		
	TBN - ① Eng -		
	② CMRCS Hentros -		
	③ P52		
<u>TBN</u>	Uplink error		
	Noise		
	Confir Simplex A -		
	Cont flow		
	852		
	+		
	+		
	- 76		
	Plant real good -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (17)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Sec loop good -		
	all ident apts OK		
	CC Back press - Manual -		
	Water Evap Autodeicing launch phase -		
	↑ yes -		
	Close back pressure valve -		
	MCC Back press valve - closed -		
	Guid - Central DV-THU - Vengard -		
MSK	- Skard Look & Bear		
	DR-DV checks - Go on navigation -		
	Planning to RT @ 1:40		
	V66		
	Net - 64M and apts -		
	May not be able to manual -		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

GET 161X 2:33:25

TSG 2:23:47

GYMC

1+30

✓ Felt jake ✓ OK ✓

✓ TLI+9 pad ✓ P37

RSE GO for TLI

> 35 of 6 clo -

10sec pad for TLI

✓ TLI pad

✓ String of 9's on TLI 6 clo

RSE - First or Second opportunity

✓ R27 - All-60 ✓

Net/et Howard on FM dump ✓

EBCOM - Working on problem ✓

107 X 104 ✓

FLIGHT DIR MISSION LOG	DAY	REV	PG (19)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	E/ - Bin 500g definitely dried out		
	Leave as is		
<u>1+46.</u>	<u>R/ - 5/K Temp cool in feels good -</u>		
	windows all clear -		
	R/ at		
	white streak across L/R		
	Top to bottom on R/H window -		
	Side window -		
	Little pin - like joint knock		
	E/ - Go on top dumps -		
	GUM - All GO		
C/TI -	Logic armed - 1/2 -		
	5655 arm CB -		
	Logic - GO -		
	Arm Pyro at TLI -		
	R/ - In helmets eyes		

HOSC OPERATIONS MESSAGE NUMBER _____

subject:

AS-505 TLI Recommendation

to:

MCC-Flight, Mr. Lunney; BSE, Mr. Van Rensselear;
BDO, Mr. Green; BUIDO, Mr. Paules

text:

MSFC has performed a prediction of the Second S-IVB Burn and recommends GO for Translunar Injection on the 1st opportunity. There is a >99 % probability of achieving guidance cut-off (GCO) based on propellants available for Second Burn. The predictions of parameters below are provided as additional information.

Time of TLI	2 Hr 24 Min 05 Sec from GRR
Duration TLI Burn (STDV to GCO)	5 Min 43 Sec
Total Space Fixed Velocity at GCO	35,590 FT/Sec
Accumulated Longitudinal Velocity During TLI Burn	10,419 FT/Sec
Delta Burn Time Over GCO	10.1 Sec

date/time originated:

18 Nov 67

date/time transmitted:

authorized by:

Fletcher Hunt

HOSC
OPERATIONS MESSAGE NUMBER _____

subject:

AS-505 TLI Recommendation

to:

MCC-Flight, Mr. Lunney; BSE, Mr. Van Rensselear;
EIDO, Mr. Green; BUIDO, Mr. Paules

text:

MSFC has performed a prediction of the Second S-IVB Burn and recommends GO for Translunar Injection on the 2nd opportunity. There is a >99% probability of achieving guidance cut-off (GCO) based on propellants available for Second Burn. The predictions of parameters below are provided as additional information.

Time to TB6	3 Hr 52 Min 45 Sec from GRR
Duration TLI Burn (STDV to GCO)	5 Min 23 Sec
Total Space Fixed Velocity at GCO	35,619 Ft/Sec
Accumulated Longitudinal Velocity During TLI Burn	10,391 Ft/Sec
Delta Burn Time Over GCO	9.9 Sec

date/time originated:

1953 7

date/time transmitted:

authorized by:

Fletcher K...

(20)

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

1 Config at CRD -

MCC - All 60 -
A1 - All 60 -

TAN MCC
A1 All set for TUE

SPAN says Neg g's at SIC

gusts are .6 -> .7 g's -
2105 GET -

A1 CRD & G cannot support -

TSC

SITE/ACQ/LOS FLIGHT EVENTS/HISTORY/BRIEFING

||||

TB 6secnd 18secnd later -

Burner - Tools pressurizing -

TB-6 on Time -

53 05 mark -

ACE pressurizing
RSE - Hyd OK -

Chilldown normal -

PU 4.5 New engine faulted -

Main Capt - up -
Burner shutdown -
Ullage

(22)

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

20 Corby good

1 min - great -

1K

Yours programmed -

1.4K -

RDS go for CRDSV -

RV shift normal -

PID - 3500

3 - All rd ✓

2:39:10 ✓

4 - All sat ✓

PID ✓

GUID ✓

Good weekend -

FLIGHT DIR MISSION LOG	DAY	REV	PG 23-
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	F100		
	13K <u>COIP</u> -		
	Some small		
	Hi frequency -		
	5600 <u>COIP</u> -		
	4 22		
	TV <u>accept</u> -		
	- .6 <u>ΔVC</u> -		
	O ₂ flow hi -		
	EECOM - Cabin press reg's		
	hooked in -		
	Auto <u>2</u> on O ₂ flow -		
	We think cabin press reg's hooked		
	in -		
	all nominal -		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING



SAT
Local prog. ✓

HAV - omni D -
FIDO nominal -

About 1 minute to go - hi freq
vibrations -

Sagan - Nominal -

2:45 CMP & CPR swapped seats -
2:00 small scales - 2:43

Cabin -

Guid - V66 To get CR slots up -

Bertel Trench - Orled Reglton -

A1 - Beautiful -

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

Even in 40 - lateral flag. Indent
felt like rough -

After 3 min hi freq superimposed
into RE
20 cps -

Vents closed - try to separate -

~~2:54/5.7 - Director off~~

~~2:54/10~~ Starting to separate

MCC - all 60 prep -
60 for system -

FIDO - All sources CMC - TO - TRAK -
Better than normal -

370253 SCO sep -

CDR/Leon see + + + -

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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World Inevitable -
 There goes the panel -

TV - B/W - Color -

fantastic -

Cryptos - Translunar Q -

Coming in 70 inch -

3+17:47. Snap Snap 2 guys

Logic safe -

3+27:30 - let TV go until get squared away

MCC
 TV Vector

11+30 57.5 fps

58 nominal

MCC 226+30 5 fps pad -

62.6 fps -

712 w/erase

70 w/erase

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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Evasive pad - vsk -

Surf pump cycle - in 30 seconds -

Vent in 7 min (3+39)

At - 10 - 3 - 4 pump kungee 1st order -
All automatically mode -

Just getting both area square downing

3+37 At just completed multibial -
 on test meter

At - 2 TO .4V - looks like vsk heater
 cycle.

TKUMY - .6 TO .8A

3+40 When we press LM -
 got a little Mylar on the back side of
 hatch -

Got some floating around -

FLIGHT DIR MISSION LOG	DAY	REV	PG 28
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<p>Aux pump did not come up - ^p 1/3 pump usage Engine did enter - Assess impact on sling shot - ETO <u>4:15</u> <u>GET</u> -</p>		
<u>3+40</u>	EOS run for CB's - AI - OK -		
	FIDU - 26+30 62.6 To 50.1 fps -		
	pc 252		
<u>3+51</u>	60 for pyro on - Wait for sep - SW is still venting -		
<u>3+54+30</u>	Vents over - 30 for sep - Pump in - TV watch -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (29)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
3757	- Backing away from SIVB		
	At Dr Park #1 & 2 - Cryo press lit		
	MCC Fans on -		
	POD		
5355	3758. Logic & pyro safed		
4400	- Can see SIVB out of hatch -		
	Est - Cryo lit's probably done to strat. heater		
	after his usage at press time -		
	Fans should fix -		
	STD purge -		
	Heaters auto		
	fans off		
	STD will stay -		
	TV of SIVB after yjection -		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

4/13

TV off -

w/o Envisir

900 hpc

~~before~~

steep capture

with Envisir

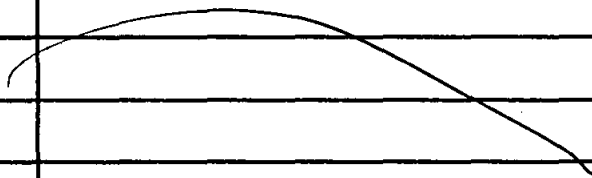
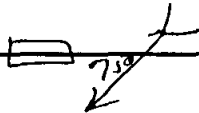
252 hpc -

steep capture -

bse - switching out to log gain

4/6

15K nmi altitude -



4/18

lost fuel dump -

Center Aux pump -

APS should hold & close -

will terminate if lost control -

FLIGHT DIR MISSION LOG	DAY	REV	PG (31)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<u>4/22</u>	Suit Circuit Ret Valve - open -		
	03+02+48 SLABEP		
	03+77+47 PACKING		
	03+56+24 EJECT		
<u>4/30</u>	EL - Ready To turn passoff		
	MCL - A - OK		
	look like 1/4 feet away from SVS -		
<u>4/34</u>	BATTSM - Gimbals -		
	+1		
	+2		
	+5		
	4/40 -		
	leaving STVskid		
	GUR BSE -		
<u>4/42</u>	95% sure that we'll ship MCL-1		
	Diff suit - personal documents -		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

MCC - Go ahead to BATA -

In about 3 minutes, shot to x dump -

F100 estimate - officially at 6+30 -

-50 to -200

BST commencing -

1 min

4+40+25 Lox dump

MCC #23 update & status -

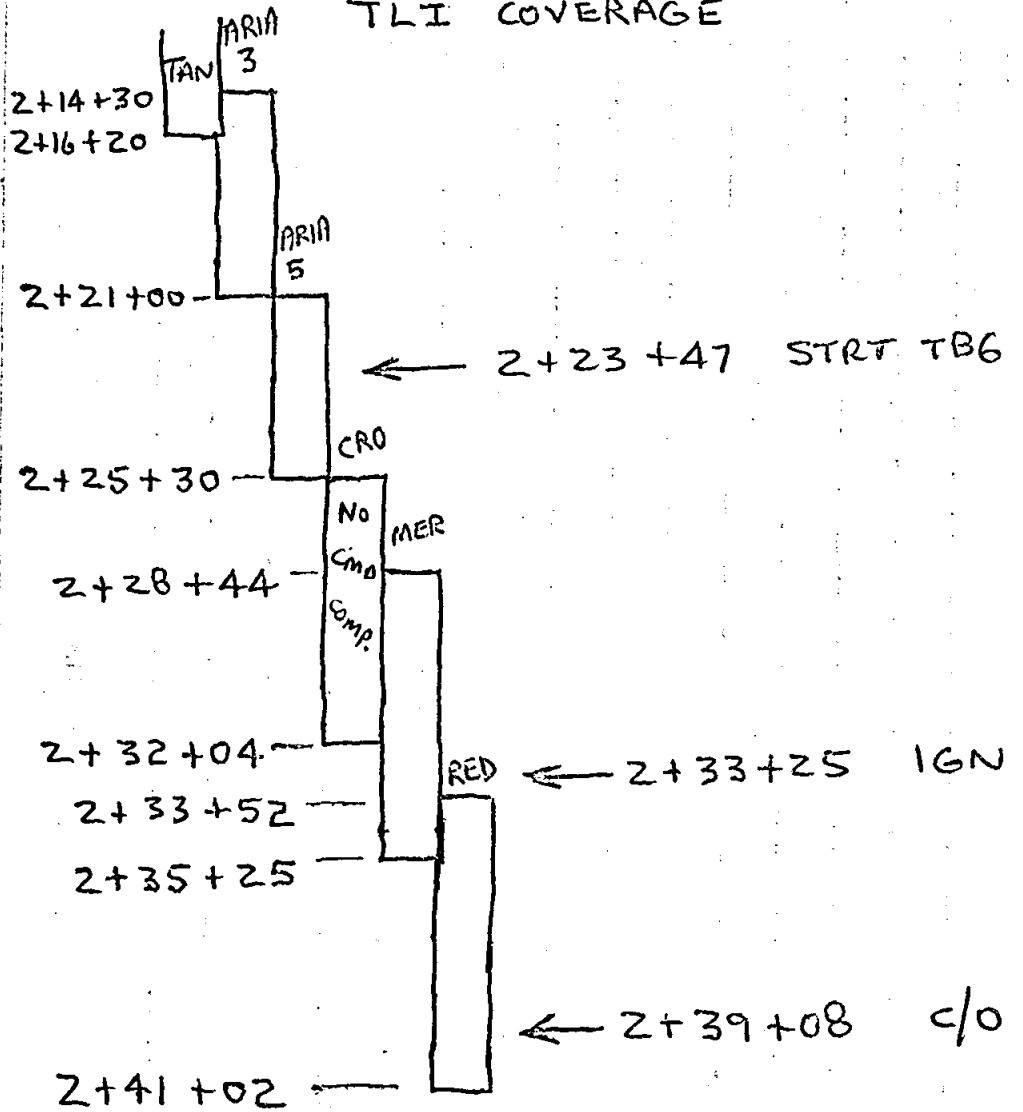
new update - Snowpass in way -

R 277 for R H window -

P 187

G 015

TLI COVERAGE



SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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--	--

	lot of trouble w the p/annu -
--	-------------------------------

	Think may be switching p/annu to post
--	---------------------------------------

5704	H18 earth view -
------	------------------

	Color TV of earth -
	852

	5707 30-22, 348 miles -
--	-------------------------

	852 trying angles -
--	---------------------

	827 anytime -
	Zero turn -

5720	Dis able squelch -
	Pause 30 seconds w/annu switch -

	Water Surf-off
--	----------------

VASIVE

GET 4+39+09

ΔV 19.7

Δt_B 3 sec

ϕ 31:51N

λ 114:52W

h 17938.3

291 290 290 295

+25 +18 +19 +25

H_v 51.05 195

d_v 493⁵ 191 sing (tank)
before

hpc 899

PREBURN

Σ VASIVE

hpc ~~28~~ 2290 POST BURN

03+02+48 SLA Sep

03+17+47 Parking

03+56+24 Exit

Evap

04+39+09

19.7 ΔV -

WT before 94,270 #

after 94027

Pc 288 nm @ 76+46

60

Sphere 62:18 MIN

PRELAUNCH

Predicted GMTLO 16+49+00 ACTUAL 16+49+00.7
LPO 103×10^3 (NOMINAL)
TLI GETI 2+33+16.0
TLI ΔV 10467.9
TLI ΔTB 5+45.3
 ΔV_{mcc} 58.7 @ 11+30+00 ("G" GRND TRACK)
AFTER EVASIVE hpc = 59.1
 $\gamma_{EI} = -6.51$

INSERTION

EPO 102.6 X 100





TLI IGN

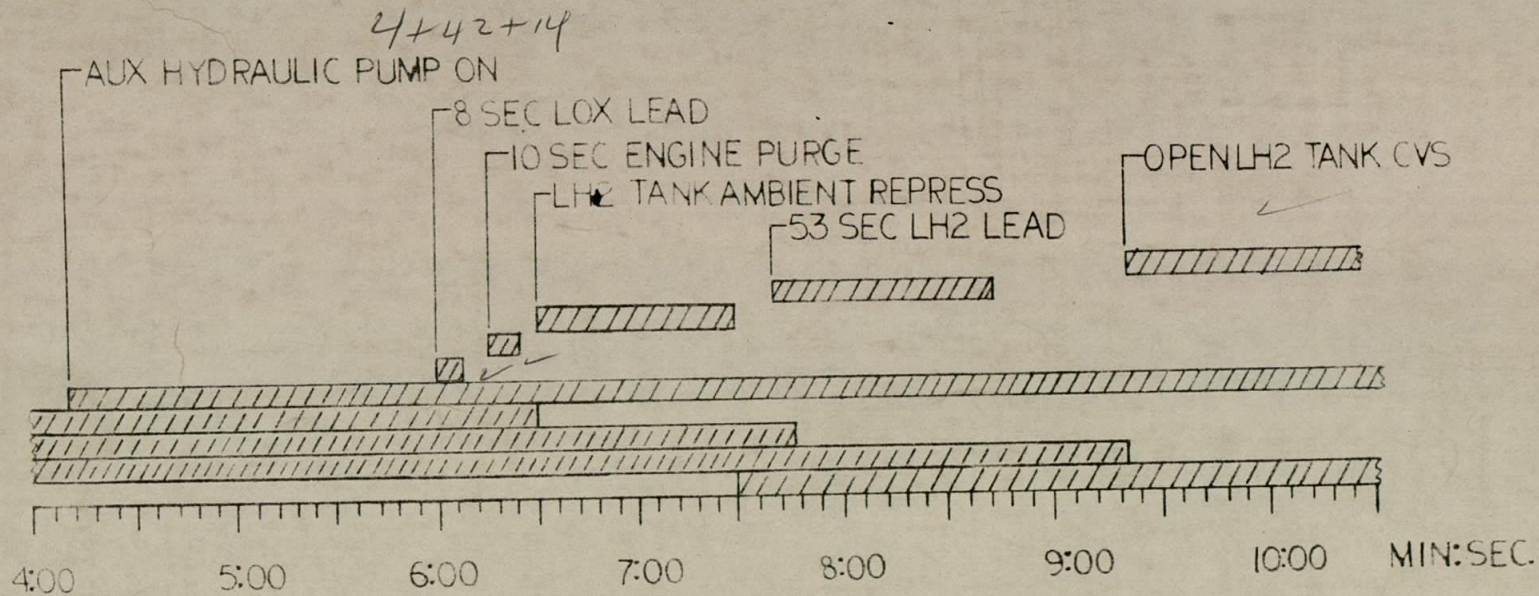
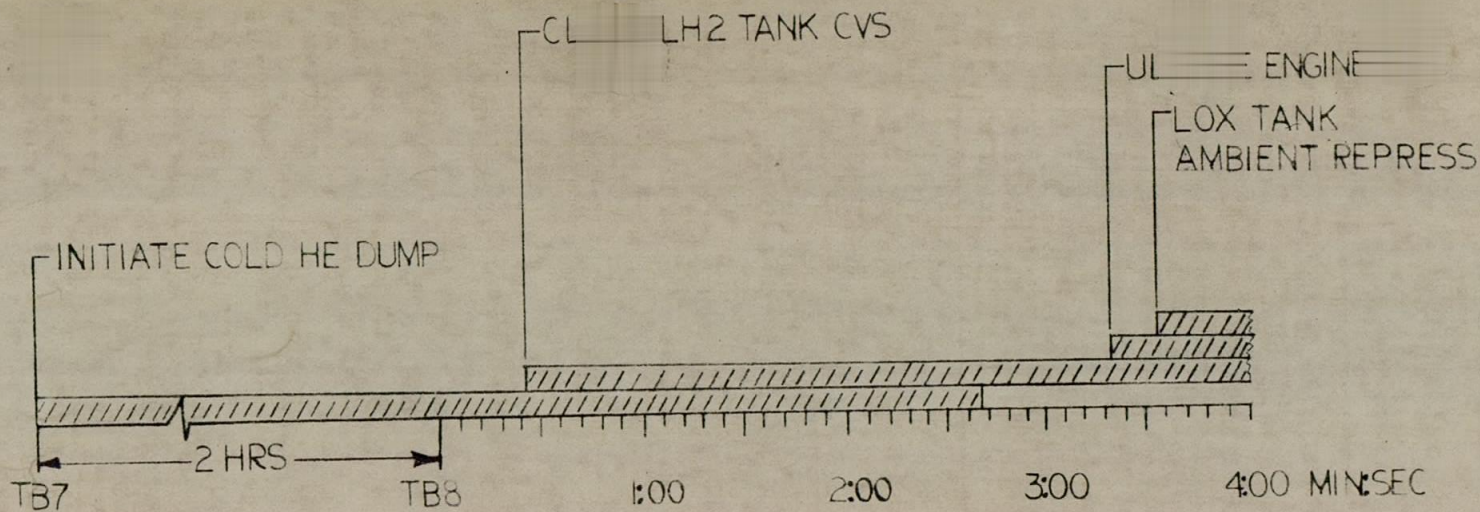
TLI CUTOFF

GET 2+33+25.9	GET 2:39:09 $\Delta t = 5+44$
ϕ 25:48.5	ϕ 13:54.5
λ 134:27E	λ 159:19E
H 106.5	H 175.08
	V 35594.7
	γ +7.01
ΔV_{mcc} 58.8	ΔV_{mcc} 57.5

FLIGHT DIR MISSION LOG	DAY	REV	PG (34)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	(1) DPS Fuel (2) APS blanket pressure (3) FC 1 O ₂ flow ind map (4) RCS Ring 2 (5) Pri brake service - forget ¹ until prim to LOI (6) MCC, Decision @ 6+30 (7) P-52 torquing angles ?		
	.1 P-52 torquing angles Water Dump 40+		
5+32	Size of Venus - Sla panel VHF lost @ 21+30 No VHF after TLI 8-9 hrs sleep - PRD Readout after Duffing Suit - have asked - Small vertical white on Rt side window		

FLIGHT DIR MISSION LOG	DAY	REV	PG 35
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<u>Guid</u> - Dnew 827 -		
	TLI+35		
5+37	TLI +11, TLI+25 now - GET+22 hrs TLI+35, 44, +53		
	No MCC -		
	with No MCC with		
	MCC ₁ 47.3 - Pc 290.65		
	MCC ₂ - 48.9 Y _{ET} - to vertical - 65 200-300fps		
5+50	W-matrix - A-10 is it OK? yes - Guido		
6+00	TLI+11, +25, +35 PADS R		
6+05	H ₂ purge heater - still on - OK to turn off -		
6+11	Waste Water transducers - probable ★		
6	7+40 now estimated time for 85% Will look at waste water		

FLIGHT DIR MISSION LOG	DAY	REV	PG (36)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
6+15	SIRB - Completed Sling shot + passivation		
	- will have data for about 3 more hours		
	- only only remaining action is commanding high gain antenna		
6+15	next 45 min Need MOC for Maint.		
	A-10 - Need Optics Calibration		
	Need PTC attitude		
6+27	Power down B-MAG's - manually?		
	B'MAGS on - 		
	VHF has been on Simplex A - - 		
	Since TAN 		
	Waste Water down to zero by 8 hour time 		
	B'MAGS - GDS		
6+34	Roll to 263° to get earth in RH window -		
6+36	Need to rewind ^{TV} tape		



TIMELINE - S-IVB POST TLI
 PROPELLANT LEAD EXPERIMENT 131 ± 26
 $126 \text{ fps total } \Delta$

TB8+12 Min

Lox dump for Engine

Blew all bottle
 bottles

- no ullage
 when off

FLIGHT DIR MISSION LOG	DAY	REV	PG (37)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Refsmatt to change during TV		
6+41	90 psi on CDR SPS - what about ? GND -		
	Optics Calibration - ? ✗		
	FIDO		
	GNC - Verify ATT Set Switch in GDC posit attitude error		
6+49	Left Hand window vice Right Hand - for TV		
	ATT Set in IMU Now GDC		
	+89985 - TRUNION from optics Cal		
	Norm 87 No. - Pro Ceed		
6+51	Step Lost Data -		
6+58	P-23 is complete to everyone's satisfaction complete with optics Cal		

FLIGHT DIR MISSION LOG	DAY	REV	PG 38
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
7+01	95 psi on ground data - sps - all world says is good		
7+05	Wide Medium vice - wide		
7+14	TV Pass -		
7+15	Ptc Refsmatt going in Computer Fault at HAW -		
7+19	Completed Ptc Refsmatt - Camera F-22 - interior		
	<u>ALC</u> in <u>out</u> side - exterior shot		
7+30	is tg in Sextant SIVB -		
7+31	elongation inherent in Camera		
7+53	39-39.2 - - keep going to 39.5		
7+56	P-52 completed to Ptc Refsmatt Waste dump started		
8+00	<u>LM/CSM ΔP - 05 psi</u> <u>50/15 on FDAI</u>		

FLIGHT DIR MISSION LOG	DAY	REV	PG 39
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
8+07	A-10 Waste - 20%		18 %
	MCC 14.5%		13 %
8+11	LMP Now unsuiting		
	Cannot confirm object tracking		
8+13	- Waste stopped o/B - 5% -		
8+17	Terminate waste water dump		
8+20	E Memory Table update		
	Flt. Plan Update		
	1.55 4A BEFORE		
	0.6.0 AFTER		
	LMP Now back on bio med data		
■	Need to do Nav Update		
	13 hrs - 5000 fps		
	ΔΔV 50 fps		
9+11	CDR has turned off - unsuiting		

FLIGHT DIR MISSION LOG	DAY	REV	PG (40)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
9+25	Nav update Completed		
	F/C O ₂ purge - #3		
9+38	CDR Now plugged into Biomed		
9+59	Started forward PTC attitude		
9+58	Lost Biomed data		
	4.2 Bits/pound waste water		
10+00	Got Bio Med data back		
<u>10+10</u>	20° Db - PTC Mode		
	at 1/500 1 Rev/hr		
10+15	Antenna B or D - Cue when crossing		
10+16	A-10 on Omni A Cannot get B		
10+21	Omni D - other in B		
10+26	1 Aspirin - CDR + 1 LOMOTOL		
	2 Aspirin - CMP		
	1- " - LMP		

FLIGHT DIR MISSION LOG	DAY	REV	PG 41
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
10+27	PRD in PRD in suit probably		
	① RHC - Direct still on - #2		
	② Waste Water - still unknown will use generation rate vs time		
	③ Down voice back up to Contact Ground		
	④ PTC comments		
	⑤ LM/CSM ΔP -		
	⑥ Confirm omni to and B		
10+34	Terminated Battery light charge turned waste dump		
	⑦ ① sections for Ground		
10+41	-RHC power direct -OFF		
	-Down voice back-up		
	PTC - cooled down immediately		
	O ₂ flow will take a while		
	LM/CSM ΔP - 6 psi		
10+49	Confirm "OMNI" + "B" on Antenna switches		

FLT. DIR.

FLIGHT PLAN UPDATE	
TIME	ITEM
	DELETE ALL MCC 1 BURN DATA
	SET UP PTC AS SOON AS CONVENIENT - FDAI SCALE SELECT TO 50/15 POSITION.
	PERFORM ON YOUR SCHEDULE :
	- BATTERY VENT - REPORT MANIFOLD PRESSURE BEFORE & AFTER VENT.
	- F/C O ₂ PURGE
	- CANNISTER A CHANGE
	- TERMINATE CABIN PURGE
	CONTINUE BATT A CHARGE AS LONG AS POSSIBLE
12+00	DELETE P37 PAD TLI +44 & TLI +53 WILL BE UPDATED POST SLEEP
	PERFORM PRESLEEP CHECKLIST & START REST PERIOD AS DESIRED.

MISSION NOTES

WASTE H₂O XDUCKER PROBLEMS

1. DUMP WASTE TANK DOWN TO
ZERO QTY.

2. DUMP UNTIL QTY. DECREASING STOP
PLUS 5 MINUTES OR UNTIL
GO FROM MSFN

3. O/B R/O WILL PROBABLY STOP
DECREASING PRIOR TO ZERO
PER INSTRUMENTATION CALIBRATION

CSM CONSUMABLES STATUS

GET _____

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>291</u>	<u>290</u>	<u>290</u>	<u>295</u>
FLT PLN MARGIN	<u>+ 25</u>	<u>+ 18</u>	<u>+ 19</u>	<u>+ 25</u>
PHASE REDLINE (LoI)	<u>64</u>	<u>72</u>	<u>71</u>	<u>74</u>
RNDZ REDLINE (UNDOCKING)	_____	_____	_____	_____
ΔV CAPABILITY DAP	<u>56</u>	SCS	<u>42</u>	_____

SPS

TOTAL Wpu 40398 LBS/ 100 %
 ΔV CAPABILITY DOCKED 5610 fps UNDOCKED 10100 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 100 fps
 BURN TIME REMAINING 597 SEC

BATTERY STATUS

A 28.9 Ah B 31.1 Ah C 37.2 Ah

A ON CHARGE

CRYOS

H₂ 51.05 LBS (-0.22) SINGLE TANK LIFETIME 195 GET
 PRESENT AVERAGE USE RATE 0.22 LBS/HR
 O₂ 493 LBS (-9.3) SINGLE TANK LIFETIME 191 GET
 PRESENT AVERAGE USE RATE 1.8 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 71.1 %
 WASTE AT 85% AT 07:40 GET
 NEXT DUMP AT _____ GET

FLIGHT DIR MISSION LOG	DAY	REV	PG 42
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
10+51	Batts - C - 36.8		
	Pyro A 37.1		
	Pyro B 37.1		
	RCS A 93.0		
	B 93.0		
	C 99.0		
	D 94.0		
10+53	- Some chlorine in water -		
	GM leak rate 2.1 psi expected in LM at ingress - 2.9 # O ₂ @ 81:30		
11+00	4 Booster lost Data		
11+58	CO ₂ 1.4 - 1.5 mm Has not changed since canister change.		
12+50	- A-10 wondering about RCS firing rate + usage thrusters awaken them		

FLIGHT DIR MISSION LOG	DAY	REV	PG (43)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Maroon Shift Status		
	(1) PTC attitude drifts causing thrusters to awake crew		
✓	(2) LM/CSM Δ P in work for purge		
OK-	(3) Waste tank quantity indicator may be malfunctioning		
	(4) P-37 Pads changed with MCC, No 60 - O/B TLI+11, 25, 35		
	(5) Some minor ^{instrumentation} thruster problems at some sites - GNC - in evaluation		
	(6) PRD's are still in PGA'S		
13+12	- Re established PTC of Roll rate		
	OK — OK		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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13+30	Shift handover
	P23 EVALUATIONS SHOWS $\Delta H_{ref} 9NM$ above preflight value. Will not update until after second set tomorrow

	TCA = 76:40 $H_{pm} = 288 NM$
	$H_{pe} = -2800 NM$
	MCC2 = 48 fps at 26:30 GET

(*)	S- IB vector now being integrated. Where is it going?
----------------	--

(*)	Retro to review about capability at 14:40 GET
----------------	---

- | | |
|--|---|
| | <u>ECCOM Review</u> |
| | 1. Pri Evap has NOT been reserviced |
| | 2. Next dump of water 23 hrs (GET) |
| | 3. Switching OMNI's |
| | 4. Cycle accumulator #2 being used |
| | 5. PPCO2 reading high after canister change (1.3) |
| | 6. Tunnel valve is now closed
LM leak $\approx .05$ lbs/hr |
| | 7. Crew still in normal voice but check list says they should have voice turned off |

CSM CONSUMABLES STATUS

GET 12+30

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	_____	_____	_____	_____
FLT PLN MARGIN	_____	_____	_____	_____
PHASE REDLINE ()	_____	_____	_____	_____
RNDZ REDLINE	_____	_____	_____	_____
ΔV CAPABILITY	DAP _____	SCS _____		

SPS

TOTAL Wpu _____ LBS/ _____ %
 ΔV CAPABILITY DOCKED _____ fps UNDOCKED _____ fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) _____ fps
 BURN TIME REMAINING _____ SEC

GET 12+30

BATTERY STATUS

A 34.5 Ah B 30.5 Ah C 37.2 Ah

NEXT CHG BATT B (22+00 GET)

CRYOS

H₂ 49.8 LBS (-0.3) SINGLE TANK LIFETIME 193 GET @ 50 AMPS

PRESENT AVERAGE USE RATE .2 LBS/HR

O₂ 575. LBS (-4.6) SINGLE TANK LIFETIME 202 GET @ 50 AMPS

PRESENT AVERAGE USE RATE 2.0 LBS/HR

WATER

POTABLE 90.1 %

WASTE 15.3 %

WASTE AT 85% AT 28+30 GET

NEXT DUMP AT 23+45 GET

CSM CONSUMABLES STATUS

GET 14+00

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>281</u>	<u>283</u>	<u>281</u>	<u>289</u>
FLT PLN MARGIN	<u>+22</u>	<u>+11</u>	<u>+16</u>	<u>+21</u> (70)
PHASE REDLINE (LOI)	<u>+167</u>	<u>+145</u>	<u>+159</u>	<u>+153</u>
RNDZ REDLINE	<u>+61</u>	<u>+55</u>	<u>+55</u>	<u>+52</u>

ΔV CAPABILITY DAP 52 SCS 42

TL MC ΔV = 24 fps and still maintain nominal mission.

SPS

TOTAL Wpu 39983 LBS / 99.5 %

ΔV CAPABILITY DOCKED 5615 fps UNDOCKED 10139 fps

BLOWDOWN ΔV CAPABILITY (UNDOCKED) 50 fps

BURN TIME REMAINING 596 SEC

BATTERY STATUS

A _____ Ah B _____ Ah C _____ Ah

CRYOS

H₂ _____ LBS () SINGLE TANK LIFETIME _____ GET

PRESENT AVERAGE USE RATE _____ LBS/HR

O₂ _____ LBS () SINGLE TANK LIFETIME _____ GET

PRESENT AVERAGE USE RATE _____ LBS/HR

WATER

POTABLE _____ %

WASTE _____ %

WASTE AT 85% AT _____ GET

NEXT DUMP AT _____ GET

FLIGHT DIR MISSION LOG	DAY	REV	PG 45 <i>✓</i>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Crew appears to be sleeping well Use of Tomatit -		
	<u>G+C</u>		
	1. PIPA'S + Gyro drifts are very low Real Good Platform .02°/hr drift (update at .075°/hr)		
	2. CMRCS Ring 1 [↑] bit rate .16 to .12 lbs/hr just as predicted Ring 2		
	3. PTC - SCS in Roll, G+N 20° DB in .1°/sec Pitch + yaw		
14:50	starting to get jet firings due to exceeding pitch + yaw deadbands. This happened within less than 2 hours after reinitializing.		
	FAO		
	FIT Pln Review - No significant changes except a new set of stars will be required for P23 0		

FLIGHT DIR MISSION LOG	DAY	REV	PG 346
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
16:09	Checking on indication of		
	1. all auto RCS relects turned off		
	2. BMAGS shut off		
	Probably a data dropout due to		
	Chart Recorder calibrations, CONFIRMED		
	S-IVB Perilune		
	78:51 GET		
	1680 NM		
	1.58°N		
	66°E		
16:58	Pitch & Yaw still hanging out at		
	20° error. and yaw jets are		
	firing randomly between 1 and 5 minute		
	intervals. The CMP is bothered		
	more than the other two crewmen. He		
	is definitely disturbed by the firings		
18:45	Range = 1100 n.mi		
	Range Rate = 136 fps		
	S-IVB		

FLIGHT PLAN UPDATE

TIME	ITEM
07	CREW CONVENIENCE:
	Provide personnel dosimeters
	and report readings.
23430	Waste water dump
25410	Attitude for P23
	D 078
	P 010
	V 000
	SOT 1 BME (14)M
	SOT 2 NUNKI (30)F
*	SOT 2 Altair (12)M NUNKI (39)F
*	SOT 4 Altair (14)M NUNKI (39)
	SOT 5 FANGLIGHT (45)M
*	Substitute Altair (12)M NUNKI (39) for
	NUNKEE (33)F on SOTs 3 & 4
	in nominal flight plan.
07400	COAV P-37 PAD (TLT 35,44453)

FLIGHT DIR MISSION LOG	DAY	REV	PG 47
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		
20:00	FIT Plan and Consumables Updates.		
	Ready		
20:48	HBR = 78% of the time during		
	LBR = 20% of the last 8 hours		
21:30	Crew is awake		
37-			
21:32	Johnny Young -		
	weather report -		
	49 fps for MCC2 - mTime		
	CDR - Taking some pictures		
<u>21/37</u>	Real great night's sleep		
	Feel great - spend in Comm -		
	Ring A 91%		
	B 94		
	C 96		
	D 92		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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21/40

Flight plan update

write notes by 23:30

P23

21/44

Thrustor Activity

B47 - C133 core dynamic
 feel in structure after
 1/4 Thruster after firing - couple
 seconds vibration like bellows

Swinging some -

Slept very well -

DSSIMATOR

26 021 CDR

15 030 LMP

05 027 CMP

Plots see no need to change

PTZ

FLIGHT DIR MISSION LOG	DAY	REV	PG 49
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	34AH on BAT A -		
21/52	News report ✓ with news in spots -		
	Duke McErdless Report -		
21/57	Water Gun - First drinks good for each - And then CAR got slug of chlorine - still kuno some -		
21/59	MCC Did you leave jet side inlet open for 10 minutes after dechlorination? M - Asked MCC if they said no - We screwed up		

CSM CONSUMABLES STATUS

*Black Team
GNC / EECOM.*

GET 21

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>280</u>	<u>277</u>	<u>278</u>	<u>280</u>
FLT PLN MARGIN	<u>+21</u>	<u>+15</u>	<u>+13</u>	<u>+16</u>
PHASE REDLINE (LOI)	<u>64</u>	<u>72</u>	<u>71</u>	<u>74</u>
RNDZ REDLINE	<u>199</u>	<u>211</u>	<u>210</u>	<u>213</u>
ΔV CAPABILITY	DAP <u>52</u>	SCS <u>42</u>		

SPS

TOTAL Wpu 39983 LBS/ 100 %
 ΔV CAPABILITY DOCKED 5615 fps UNDOCKED 10139 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 100 fps
 BURN TIME REMAINING 596 SEC

BATTERY STATUS

A 34.00 Ah B 29.88 Ah C 37.22 Ah
 TOT - 100.12

CRYOS

H₂ 48.7 LBS () SINGLE TANK LIFETIME 194 GET @ 50 amps
 PRESENT AVERAGE USE RATE 0.1839 LBS/HR
 O₂ 589.7 LBS () SINGLE TANK LIFETIME 198 GET @ 50 amps
 PRESENT AVERAGE USE RATE 2.18 LBS/HR

WATER

POTABLE 89.6 %
 WASTE 21.6 %
 WASTE AT 85% AT 33:00 GET
 NEXT DUMP AT 23:00 GET

SITE/ACQ/LDS

FLIGHT EVENTS/HISTORY/BRIEFING

22/10 -

CRK - Put some in Julie Sharkey's
chlorine

MCC - Open inlet to outside Tank -

Draw off a bag and get
rid of it

CRK - Asked a few questions about

chlorine water - used the

chlorine again & note open

potable inlet.

MCC gave them the wrong scoop -

22/12

MCC - Get rid of that juice -
(They have plenty of water)

OK - OK -

FLIGHT DIR MISSION LOG	DAY	REV	PG (57)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	44/CS1 .9 psi		
22/-	O ₂ purge		
	BATT B change		
22/30	Because of CS1 leak, and		
	present O ₂ quantity in CS1 - no further		
	need to press Tunnel, or to open		
	water weight valve - Nature is taking		
	care of us with the system leads		
	and use of O ₂ in CS1 -		
	22/32		
	97,949		
	V: 5557 f/s -		
	48.7 6.7 seconds down -		
	Should get to 2 steering ends -		
	Water Pump @ 23:30		

FLIGHT DIR MISSION LOG	DAY	REV	PG 52
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
22/47	E/ - Reminder close possible inlet		
	MCC -		
	A1 - OK -		
	MIT 24 Km		
	15 miles		
	John yesterday		
	9 miles -		
22/57	A1 - Cycle engines		
	MCC - 2 minutes each tank -		
23/02	Surgeon Dick Sawyer Cape		
	Waterman for Surgeons -		
	Don't know anything about		
	Agreement on not chlorinating -		
	Sawyer says we should have at		
	12 hours GST		

FLIGHT DIR MISSION LOG	DAY	REV	PG (53)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
23/04	My God - Music from space - CCK says makes voice a little higher -		
<u>23/10</u>	^{MCC} Another question on water Drained it off in grape juice CCK - Don't sweat it -		
	Go for water dump at 23/30 -		
<u>23/30</u>	At 10x20 ⁱⁿ ^{one} particles - 1/10 the size of urine dumps		
	MCC - cutoff @ 14 th -		
	Dumping 24 th to 14 th .		
	CCK - Can he be seeing the SIVB -		
	<u>23/36</u> 94.7 sft 347 TVR		

FLIGHT DIR MISSION LOG	DAY	REV	PG (54)
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Cutoff tent 7.7 th		
23/40	Main bog check - OK -		
	The second reg slipped to 75		
	psi for 2 data frames John Young		
	said his finger slipped off for 2 seconds -		
	Ecom does not think that explains it -		
	More likely that that regulator is just		
	being used very occasionally &		
	didn't come in fast enough -		
	will write up that one - But feel		
	it's OK since it recovered well -		
	2nd second test was good -		

FLIGHT DIR MISSION LOG	DAY	REV	PG 55
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	See Pump off -		
<u>23/53</u>	A1 - Rpt empty chub OK		
23/54	A1 SXT TV set on landmarks - When clouds cleared, looks like piece of coal -		
23/56	A1 5-10 minute Hot particles disjunct from the waste dump		
23/59	A1 Cub has some thunder burps looks like a picture -		
24/01	A1 looks like Gulf Coast may be clear - except for sun -		
	looking at something looks like SIVB - right side of RH window + to Gemini retro		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
	Rotating - Bright - 3 dimensional
<u>24/00</u>	Regain caution - May have bumped rock button - Caution 122 -
	1700 - During that sighting
	BT - 30° from first one a second
	rotating object
	1/2 kilometer
<u>24/10</u>	<u>HCC -</u> V5 N
	- Negotiated - Did not dis turb (AG -
	<u>Good -</u>
	BT - John Young says he did not hit
	button, he doesn't think so -
	So what caused it??
	Good - looking -

FLIGHT DIR MISSION LOG	DAY	REV	PG 57
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	2 Things T		
<u>24/18</u>	<u>GUID</u>		
	Cnptr in P00		
	get on interrupt - 304h address		
	input -		
	Mark - DSKY set.		
	Then looked at input channel		
	To see if it got a physical input		
<u>24/18</u>	STAR Vis. 6. let 4		
	Sun * in #5		
	Southern Cross nt L Window		
	Couldn't see any other stars -		
	alpha Bet Centauri		
	Acrop		
	Sun mostly shaded -		
	First time he piled some nt		
	Looks around to see it it was in program		
	122 alarm - Mark with a bell for		

FLIGHT DIR MISSION LOG	DAY	REV	PG (59)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	113 means no link BS -		
	Think it had to be actual hardware		
	error. The only thing that can explain		
	it.		
	FAO - CRIS instructor claimed		
	This happened in Training -		
<u>ref/23</u>	East coast under clouds		
	<u>MCC</u> - Can't explain 122 alarm -		
	<u>Al</u> John does not think he pushed either button -		
	∴ I told GUP, GUC to research some - I don't want problem		
	dropped -		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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24/26 Go ahead little early on P52
P23 work -

24/34 GUID - P23 data -
- Goes rapidly
Little delay @ N49 points

TRN Bias Calib - ~~Keep Jan setting~~
~~same as~~ Move TRN away
and back -

24/37 A1 - Bring TO P23

MCC - Slow @ N49
TRN Bias off then back -

1° or so then back -

A1 - Was moving both directions -

MCC - will need correct for
switching antennas

A1 OK -

FLIGHT DIR MISSION LOG	DAY	REV	PG (60)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	MCC		
24/46	Can you get HOD for P23 -		
	-52 8		
	270 9		
24/54	A1 - Earth & light scattered		
	Thru telescope - <u>reflection</u> -		
	Can't see any stars -		
	MCC - Try for another 5 minutes		
	if can't see stars - Skip for now		
	and we'll pick up later -		
	FAO - Skip calibration - TRANS -		
■	24/58 - P23 going on -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (61)
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		
25/05	A1 - Question about MR bios - McLeave bios where it was yesterday		
25/06	- leaves yesterday -		
	27:31:34 h = #3 12,991		
25/09	OK DV 572 vector - 0000 1 fps		
25/10 25/13	00000 1		
25/16	⁶⁴¹⁰ 5th Minna program plan optics switch off before - No problem		

SITE/ACQ/LOS FLIGHT EVENTS/HISTORY/BRIEFING

~~25/37~~

Ready for 27 -

MCC2 PAV-

A1-Trim .2 if (smooth) 2

✓ Reminder about Sun

γ 180
 ϕ - 55°

P100-~~now~~ vector 60 ~

MCC

25/48

Burn off - SXT 84 FT TAN for SIVS
 161.5
 032.1
 1680 miles - SIVS -

A1 - Bank B - Bank A in 3 seconds

MCC - Verify -

Discontinue Bank B at 26 GGT

G/- Going to burn attitude

FLIGHT PLAN UPDATE

TIME	ITEM
27:15	Attitude to Point
	Window # 5 at Moon
	in PTC P 90° Attitude
	for TV
	R 320°
	P 090°
	Y 000°
	Hi-gain Antenna Angles
	P 005
	Y 265
	S/C R 367° places
	moon in window 5
	earth in window 1

FLIGHT DIR MISSION LOG	DAY	REV	PG (63)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
25/59 -	A1 - Good view of moon - Can see other part in earth shine		
	26/32/56		
	R 99 ΔV _T 48.7		
	P 184 WT B6000 93872		
	Y 359 Alt 39419		
24/07	A1 - STAs out side window - identified - Can identify -		
	<p>★ Could do P 51 with EM blocking sun Identifying STAs is easy -</p> <p>Cor seen over X axis -</p>		
26/10	Sun set		
26/13	STa Check - ✓ 602 1/2° off -		
	<p>Did not see SIVB since he did not buy any thing -</p>		

FLIGHT DIR MISSION LOG	DAY	REV	PG 649
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Event timer not set by eight entered -		
	2 minutes off -		
	We collected -		
	Bank B -		
	Aug 9		
	on off -		
26/32/56	- .9		
	back to -.2		
	5/150ETS off		
	animal rates off -		
	Nucleone		
	Did not feel second bank -		
	4psi -		
	At 99.4 full		
	99.0 of		
	850 decr		
26/41	MCC - if go North, can see Earth		
	out window, moon out further -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (65)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
■			
26/30	A1 Going to put TV on -		
	<u>MCC</u> - BATT change -		
	<u>MCC</u> - RT plan update w/ sleep TV -		
	A1 - Question on 4.2.1 -		
	- Seems heaters taking fuel -		
	C-D -		
■	A1 - Moving to new attitude -		
	<u>MCC</u> - Will take time to get enough		
	Touching data -		
	- Cookbook on surface -		
	GNC1 - New procedure for PTC -		
26/56	- <u>MCC</u> - procedure to try it PTC -		
	Trying to start to min. mission		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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27+01	TV /
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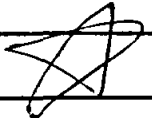
	MCC Narrow beam on H3A -
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	TV of earth -
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27+08	MCC SPS data -
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	Cycle ACC switch -
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<u>27/19</u>	2.8, 2.2
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<u>27/31/24</u>	MCC Hoch wolfery -
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	MCC - no need for more MCC -
	Looks OK - About 160 pc -

	At - Did not see SMB -
--	------------------------

	CPR - feels good about Commi.
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	Phil Shaffer - smiling -
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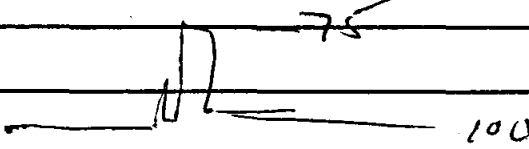
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FLIGHT DIR MISSION LOG	DAY	REV	PG (67)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
27/35	Sigsbee X - 0000 -		
	TRIPODS -		
	hpc ~ 60		
	hp - 10 fps @ 92 GET -		
	- 85 miles - $\gamma = -11.95^\circ$		
27/40	A - RTZ config		
	MCC		
28/07	16-20 Single jet pulse -		
28/18	Type Recorder -		
	Korn West -		
	Good check on Solid Sordent		
	No current on ground keep -		
	Bunkles in water -		

FLIGHT DIR MISSION LOG	DAY	REV	PG 68
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	First attempt at auto reacq -		
	did not acquire - tried too		
	late		
28/38	HGA now -		
28/52	FCC looks like reacq worked -		
	Atmt HGA m		
28/57	HGA Reacq Tests -		
29/01	MCC limits for gimbal limits on this time		
	now -		
	GUTB action Tight PB -		
	Risque CD -		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
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29/13	<p>Abort summary included</p> 
29/15	<p>of Gribal p +60 y 220</p> <p style="padding-left: 150px;">+60 240</p> <p style="padding-left: 150px;">+60 270</p> <p style="padding-left: 150px;">-10 90</p> <p style="padding-left: 150px;">0 120</p> <p style="padding-left: 150px;">0 130</p>
29/17	<p>MCG.</p> <p>Review PTC Setup Again</p>
29/24	<p>Dump over</p> <p>Omni B-</p>

FLIGHT DIR MISSION LOG	DAY	REV	PG (70)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
■			
	MIT Camps		April 8
	Current 24 Km		
	yesterday 33-34 Km		
	Today 13-14 Km		
	J		
	Milt -		
	Review 2.01 Abort with		
	Bill Struble - He is last man		
■			
	To talk to John Young about this -		
	we should have his cue cards on		
	decks To check here -		
	Especially the procedure for opposite		
	SV thrust switch off for suspected		
	ball valve failure.		
	Bill Did not talk to John about how to terminate		
	thrust with bad indication - other change		
	is in Pc indication for one bad set valve.		
	.80 is wrong -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	① PTC -		
	② ΔH ⁺ No's 24 Km NOW		
	yest. 33-34 km		
	today 13-14 km -		
	③ Waste Water		
	Returns TL1+25, 33, 44, 53		
	GET 44 35:30 hrs GET - 5500		
	90-hrs-GET 6695		
	LM current ramp		
	ECCOM - ① Batt A - additional charge		
	32-33 may require		
	Char		
	MC+W H ₂ tank press -		
	may affect sleep		
	No Vac ion pump operation		
	Main Reg problem -		
	Change. No LM pressurization		
	75% HBR on menu's		
	Stand PCO ₂ status ★		
	LM activation check list ★		

FLIGHT DIR MISSION LOG	DAY	REV	PG (71)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
29+42	Stand by on load ? Back room ? - Crew Getting		
29			
█	PTC De logs -		
	DSE Dump ★		
	P-CO ₂ -		
	Proceed on per		
	GNC		
29+52	Require Stability - ★ Back Room Support		
29+52	PTC Started - fairly stable		
	HGA		
	Cannister		
30+00	30 hr GET 1.05 psi 4M / CSM ΔP		
30+01	GNC - .01 Drift		
	PTC - 3 to 4 #/hr over past hours		

FLIGHT DIR MISSION LOG	DAY	REV	PG 72
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
30+31	Checking over Lunar Stuff - A-10		
	Pitch	Yaw	Roll
30+32	positions - -1.5° -6.2 42°		
	DSE Recordings - twice		
	3 Separate sites could not lock up		
	What to do? ✓		
30+54	SPS oxid Ullage pressure question		
	Water Dump time ★ ✓		
	CNC error +4.6 +5.9 +7.0		
	+ 8.7 - 0.2 +26.8		
	+ 2.6 - 8.3 +38		
	- 0.3 - 8.3 +14		
31+20	@34 Batt B - 37 at an.		
	Change Batt A tomorrow ★		
31+25	33+30 - potable full @ 41+50		
	Waste 85% @ 51+45 ★		
	Platform at least as good as A-8 + A-9		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

TO Do - Crew to lead -

- ① P-23 Data
- ② DSE Dump
- ③ will use omni antennas during PIC
- ④ Water Dump - after wake up - ^{85%} full @ 51 hrs
- ~~④~~ ④A Batt B off line
- ⑤ Consumables OK
- ⑥ RHC #2 power is on
- ⑦ H₂ heaters
- ⑧

31+37

P-23 Comments - to Crew Good

Distinct horiz yesterday - using upper ox
today not distinct - apparently not ^{there} ~~apparent~~

horizon too bright

hand held centrifuge - was it tested on
ground - ? Bubbles go wrong way
start with small bubbles then go to
big bubbles - FAO - will follow
up with SPAN - *

7.2 - 38 ~~70~~

0.1 - 7.2 - 8.6

FLIGHT DIR MISSION LOG	DAY	REV	PG (74)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	MC+W on H ₂ - turn H ₂ tank #2 heaters off for night		
31+49	State		
32+32	State Vector Update in - Tape Dump Complete Back on Comm B + D		
32+36	Batt B Still on line -		
32+51	Fly By PAD to Crew		
32+56	- Cryo fans recycled		
	Pyro A-37.0 v Batt C-36.8 v		
	Pyro B-37.0 v		
	RCS A-87%		
	B-88		
	C-92		
	D-86		
33+32	- DSE Dump		
	5 sites got Downlink		
	Fair to Excellent on Same Data		
	that sites were unable to get played		
	back earlier - Now OK in		
	both Voice + Data		

FLIGHT DIR MISSION LOG	DAY	REV	PG (75)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
33+36	Terminating Batt B Charge -		
	F/C O ₂ Purge.		
	CDP-1 - Tomofil		
	CMP 1 - Tomofil		
	LMP 1 - Tomofil + 2 Asprin		
	CMP - A +.01 }		
	CDR 26029 } PDR Readings		
	LMP 15031 }		
33+45	Crew to Sleep - Signing OFF		
34+00	ΔH Number in Erasable Memory		
	is 24 Km - best guess is that		
	John's eye is calibrated at 33 Km -		
	No update required - A-10 told this		
	difference in the two P-23 's is		
	generally attributed to the much higher		
	brightness level on the second P-23		
34+03	- S Band Voice mode to OFF improved		
	HBR % Considerably - Getting 50%		
	before		
34+13	CMP in CDR Seat for night - RADox .3 -		
34+16	3.5 ah before burn, 4.8 after burn - now @ 36.7 ah		
	Batt A Charge @ 44:15		

CSM CONSUMABLES STATUS

GET 29+30

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>265</u>	<u>260</u>	<u>262</u>	<u>263</u>
FLT PLN MARGIN	<u>18</u>	<u>6</u>	<u>10</u>	<u>11</u>
PHASE REDLINE ()	<u>64</u>	<u>72</u>	<u>71</u>	<u>74</u>
RNDZ REDLINE	<u>187</u>	<u>199</u>	<u>197</u>	<u>200</u>
ΔV CAPABILITY	DAP <u>52</u>	SCS <u>41</u>		

SPS

TOTAL Wpu 39503 LBS/ 99 %
 ΔV CAPABILITY DOCKED 5571 fps UNDOCKED 10086 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 100 fps
 BURN TIME REMAINING 590 SEC

BATTERY STATUS

A _____ Ah B _____ Ah C _____ Ah

CRYOS

H₂ 46.95 LBS (.1749) SINGLE TANK LIFETIME 196 GET
 PRESENT AVERAGE USE RATE .1749 LBS/HR
 O₂ 547.44 LBS (.8872) SINGLE TANK LIFETIME 198 GET
 PRESENT AVERAGE USE RATE 2.35 LBS/HR

WATER

POTABLE 29.1 %
 WASTE 32.3 %
 WASTE AT 85% AT 41:52 GET IF POTABLE TK STAYS OFFLINE
 NEXT DUMP AT _____ GET

FLIGHT DIR MISSION LOG	DAY	REV	PG (76)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	In Work -		
	⑤ EECOM -		
	✓ ① BATT A charge time - 44:15		
	✓ ② Secondary Reg problem -		
	✓ ③ DSE Dump problem - now OK, but what was problem?		
	✓ ④ PCO ₂ status - maybe scale - NO sweat		
	✓ ⑤ HGA plot - same as 8 -		
	GNC ⑥ H ₂ heater ops for tomorrow - Normal		
	① PTC Evaluation		
	1 ^o story vs 3 ^o story		
	✓ ② Thermal status		
	③ LOI checklist - Loss of ball valve does not necessarily mean 80 psi		
	FAO Did not talk to crew about this at Cape		
	① Water bag - Gas wal - during working hours tomorrow		
	TELCOM + Control		
	- ① Check list stuff		

FLIGHT DIR MISSION LOG	DAY	REV	PG (77)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
34+24	Req answers - (A) May have been in bath or (B) May have stuck on		
	Recommendation is to wait until next scheduled check at 48+20		
	DSE - Span working - probably unit know know about it.		
36+27	<u>MR HUNTER AT CRO</u> *		
	All AUS - will be watching A-10 24 th		
	137+45 GET - Post TEI		
	All Stations will be involved		
	Give greetings to Australian Tracking Station + to people		
	American 525 to AUS lines 650		
	Mr. MASON 7, Goddard has button		
	Candera Switch		
	Mason will tell Crew - tomorrow nite - if no one cares -		
38			

FLIGHT DIR MISSION LOG	DAY	REV	PG (78)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Maroon handover to Orange		
✓	(1) Main Reg is funny - check at next redundant components check @ 48+20 -		
✓	(2) PTC has been great from 29+52 to 36+52 - no thruster firings at all, however may be diverging 36+59 - apparently not		
✓	(3) Omni switching fine shape - no voice on down link make HBR good about 70% of time		
✓	(4) DSE now works O.K. SPAN looking into it, but doubt if any reason can be found for failure to Dump play back earlier -		
✓	(5) LM check lists and RNDZ checklist brought up to date with back up crew work - someone should look at <u>CSM</u> checklist -		
?	(6) Whirling bag does not seem to remove water Hydrogen gas from water - FAO will have SPAN/ESD people check this in morning		

SITE/ACQ/LOS/

FLIGHT EVENTS/HISTORY/BRIEFING

✓

(7) Mr Hunter at CRO wants Crew to tell Australian people "hello" during TV pass at 137+30 - Maroon will brief crew -

✓

(8) PCO₂ is probably broke - My opinion not anyone else's

?

(9) there is considerable confusion about TV pass at 137 - is it B+W or color - ??? I give up -

✓

(10) LOI checklist -

a) - Loss of ball valve does not mean Pc of 80 psi ? Crew should know this since they have seen 1 bank ops

b) No briefing for John Young by Bill Struble on how to feminize LOI with one ball valve imperative

✓

(11) Batt A charge need to be resumed scheduled for 44+15 - above loss of charger redline now

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

- ✓ (12) Do not need to update ΔH in ~~executable memo~~ CMC - Crew knows
- ✓ (13) PTC DAP - Cannot do lane P-00 or load DAP - ie cannot load V-37 CAN use extended vectors in fact we loaded a new state vector and also got HGA with V64
- ✓ (14) H₂ tank #2 heater is off due to MC+W popping off - works fine except must of H₂ is coming from tank #1 ?

FLIGHT DIR MISSION LOG	DAY	REV	PG 81
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<u>G&C Review</u>		
	1. CM RCS RING 1 down to 37 psi in HEMNFD		
	RING 2 still holding around 37 to 35 psi		
	2. MIT looking into Prog Alarm for "Not Marking"		
	3. PTC - Roll rate = .3°/sec, 30° DB		
	4. PIPA + Gyros ^(102°/hr) performing very well		
	5. G&C's want to shut off good set of ball valves during <u>Surgeon</u> if one set indicates closed		
	1. CMP Sleeping very soundly		
	<u>FIDO Review</u>		
	1. hpc = 61.5 nm		
	MCC ₃ = .7 fps - Do No MCC		
	hpc = -62.7, $\gamma = -11.02^\circ$		
	<u>EFCOM Review</u>		
	1. Batt Charge at 44:15 - Charging going good so far		
*	2. Check on HGA Reacq Test results		
	3. Is VOGA necessary? 0		
	4. FC water now going into POT tank		

CSM CONSUMABLES STATUS

GET 36730

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>264</u>	<u>261</u>	<u>262</u>	<u>262</u>
FLT PLN MARGIN	<u>19</u>	<u>8</u>	<u>7</u>	<u>12</u>
PHASE REDLINE (LOI)	<u>200</u>	<u>189</u>	<u>191</u>	<u>188</u>
RNDZ REDLINE	<u>78</u>	<u>63</u>	<u>63</u>	<u>64</u>
ΔV CAPABILITY	DAP <u>53</u>	SCS <u>42</u>		

SPS

TOTAL Wpu 39503 LBS/ 98.5 %
 ΔV CAPABILITY DOCKED 5572 fps UNDOCKED 10093 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 100 fps
 BURN TIME REMAINING 590 SEC

BATTERY STATUS

A 32.4 Ah B 36.7 Ah C 38.2 Ah
 NEXT CHG BATT A (44+15)

CRYOS

H₂ 45.4 LBS (-.3) SINGLE TANK LIFETIME 206 GET
 PRESENT AVERAGE USE RATE 0.19 LBS/HR
 O₂ 536 LBS (+3.5) SINGLE TANK LIFETIME 212 GET
 PRESENT AVERAGE USE RATE 2.0 LBS/HR

WATER

POTABLE 78.2 %
 WASTE 51.4 %
 WASTE AT 85% AT 51745 GET
 NEXT DUMP AT NONE GET
AT PRESENT

FLIGHT PLAN UPDATE

TIME	ITEM
44430	INITIATE BATT A CHARGE
44450	WHILE ^{NA} OUT OF PAT CC PROGRAM 15 XBT CALIBRATION
	WIND A/R BTT OUT 100 100
	R 090
	P 350
	Y 358
	STAR NAVAL (39) F FORMALHAUT (45) N
51445	WASTE WATER DUMP

Notes:

1. Use A/C Roll today
2. hpm = 61.8 NM, GET = 76 hrs
MCC 3 ≈ .7 fps
3. Leak Rate in CMRCS Ring 1
has not .16 #/hr.
Ring 2 is not leaking
4. Cryo Plan Heater B in H₂
tank 2 (Auto), Tank 1 (OFF)
5. Max Amplitude was 21° in P+Y

29+33

MISSION NOTES

Batt B Charge Data

1. 2 part - Charge
 2. C/o for crew sleep cycle
 3. Charge ratio: 0.8 a-h / Hour
 4. a-h removed: 10.1
 5. a-h Returned: 8.6
 6. I c/o: .062 amp
 7. V c/o: 39.08 v.
- DT charge: 10.6 hours
Present Level: 36.7 a-h

[Signature]

FLIGHT DIR MISSION LOG	DAY	REV	PG 82
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	3. PCO ₂ is unreliable - Need to check that canister changes do occur.		
	4. Main Regs are working OK, but will need to watch it		
	5. H ₂ C&W due to low cryo press. Heaters Auto in tank #1 " Off in Tank #2		
	Tank #1 pressure drops to about 239 psi before heaters came on		
	6. — 0 —		
40:00	G+C and Guid. O have reviewed the CSM RND ₂ Checklists Fenner and Canin agree with them as written.		
42:00	Cryo Plan for today: ^{Purpose is to} balance tank g ₁ & g ₂ . H ₂ Tank #2 - Heaters Auto Tank #1 - Heaters Off If this results in MCAW's due to low pressure in tank #1; the plan is to turn off the heaters and turn on the fans in tank 2.		

33-34 Km Δh

13-14 Km Δh

Onboard Value is 24 Km

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	T runion Bias Calibration Using P23		
	Referencing crew checklist page G 7-27		
①	at step 2 load N70 with R1 00045 R2 00000 R3 00110 PRD		
②	at step 4 Enter		
③	perform steps 7 and 8		
④	with OSS in manual mode, PRD at N87		
⑤	at V51 do V34E		

FLIGHT DIR MISSION LOG	DAY	REV	PG 83
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
43:30	A10 Called to say Good Morning		
	Read UP News Report & General S/C status		
43:54	A10 LM/CM AP = 1.9 psi		
	Traj Summary:		
	1. MCC @ 95 hrs GET to get back into		
	Corridor is 17 fps		
	2. MCC at 95 hrs GET to get back into		
	Corridor AFTER the Flyby Maneuver is		
	8 Fps.		
44:07	A10 "Crew likes PTC attitude because		
	they can see the Moon and the Earth		
	for about 1/2 Rev."		
44:10	MOC is DOWN "Machine Problem"		
	ETO 5 minutes - The other		
	machine is back on line at 44:13		
44:29	Crew comment on Bubbles in the		
	water		

FLIGHT DIR MISSION LOG	DAY	REV	PG 84			
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING					
44:47	H ₂ tank #1 light ON when fans were cycled ON					
	Tank imbalance is 5% - tank 1 is low.					
45:05	Lost 2-way lock with S/C					
	BLACK TERM ON					
	<div style="border: 1px solid black; padding: 5px;"> <p data-bbox="460 735 1357 980">Maroon flight - do not brief crew to speak to Australians per your notes - talk to Glynor.</p> </div>					
45:20	John checking planet option for alignment - staying in PTC.					
	Program caution - target out of view no problem					
	Program alarm - optics transmission > 50°					
	Can see Saturn (planet) + Jupiter					
	easily visible through optics					

FLIGHT DYNAMICS CHANGE OF SHIFT 84

SHEET 1 OF 1

MISSION F

DATE 5/20/69

GET 45 : 40 : 00

PHASE TLC

REV NA

GMT ___ : ___ : ___

CURRENT

h_a _____ nm

V_i 3750 ft/sec

h_p _____ nm

GET_{pc} 76 : 00 : 14 h_{pc} 62.3 nm

Orbit Period _____ min

h_{earth} 158,700 nm

h_{moon} _____ nm

MANEUVERS

Predicted

Actual

Mvr _____

GET ___ : ___ : ___

GMT ___ : ___ : ___

Rev ___ Over ___

ΔV [][][][][] . []

Thruster _____

Δt_B ___ M : ___ sec

PREBURN	POSTBURN
h_a _____	_____ nm
h_p _____	_____ nm

Predicted

Actual

Mvr _____

GET ___ : ___ : ___

GMT ___ : ___ : ___

Rev ___ Over ___

ΔV [][][][][] . []

Thruster _____

Δt_B ___ M : ___ sec

PREBURN	POSTBURN
h_a _____	_____ nm
h_p _____	_____ nm

Predicted

Actual

Mvr _____

GET ___ : ___ : ___

GMT ___ : ___ : ___

Rev ___ Over ___

ΔV [][][][][] . []

Thruster _____

Δt_B ___ M : ___ sec

PREBURN	POSTBURN
h_a _____	_____ nm
h_p _____	_____ nm

NOTE:

*CURRENT
MCC-3 solution
GETI = 53 + 45
 $\Delta V = 0.7$ fps*

NOTE:

*AT
MCC-4 solution
GETI = 70 + 45
 $\Delta V = 2.8$ fps*

NOTE:

Prepared by MGK

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
--------------	--------------------------------

45+40 Guidance - he has killed the deadband with a verb entry - V37, V48, V46 will all ~~be~~ collapse the deadband - need to get him to reload. Advised John to put deadband back after P52.

45+40 Crew turned on H₂ purge heaters
 Auto optics not positioning stay right in the center of the sextant. John wants to do another realign when PTC is stopped.

45+52 EECOM
 Tank 2 - Auto
 Tank 1 - OFF
 - balance today - may get some MCW's
 Will go back tonight to same config.
 Crew acknowledged.
 John asked if he should reestablish deadband at 90° - answer is no.
 Les' still OK as is.

FLIGHT DIR MISSION LOG	DAY	REV	PG 86
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
46+09	H ₂ purge		
46+14	H ₂ purge complete - heater off		
	Capacitor charges going OK.		
	Optics tracking no problem - very smooth - much easier than simulator.		
	Hesn't seem stars that he can identify through telescope.		
	PTC working great		
	LM occlusion of stars not as bad as crew expected.		
	"Stack has a motion of its own during PTC". Shudders on its own every once in a while.		
	Anomalies ^{noted by crew -} - 1) Mylar insulation on tunnel hatch.		
	2) Air in the water - probably in there at the Cape servicing.		

FLIGHT DIR MISSION LOG	DAY	REV	PG 87
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Y 270 at 57 post the low HGA C's P 45		
	Some discussion of LOI about cues		
46+57	High gain acq.		
	Sending TV to the Madrid for recording.		
	Ecom says HGA a little off of 10 db below nominal - had him go med then narrow. no help		
	Now had him go wide then back to narrow to probe some, we were at an side lobe - that fixed it. He was on sidelobe!		
47+14	More talk about LOT about cues		
	Y 270 } at 47+24 HGA C's P 45 }		
47+24	HGA acq		

CSM CONSUMABLES STATUS

GET 45+00

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>264</u> <small>240</small>	<u>259</u> <small>242</small>	<u>262</u> <small>246</small>	<u>264</u> <small>246</small>
FLT PLN MARGIN	<u>24</u>	<u>11</u>	<u>16</u>	<u>18</u>
PHASE REDLINE (20L)	<u>64</u>	<u>71</u>	<u>71</u>	<u>74</u>
RNDZ REDLINE	<u>180</u>	<u>193</u>	<u>190</u>	<u>195</u>
ΔV CAPABILITY	DAP <u>53</u>	SCS <u>42</u>		

SPS

TOTAL Wpu 39503 LBS/ 98.5 %
 ΔV CAPABILITY DOCKED 5572 fps UNDOCKED 10093 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 100 fps
 BURN TIME REMAINING 590 SEC

BATTERY STATUS

A ON chg Ah B 35.9 Ah C 38.2 Ah
 Total = 106.4

CRYOS

H₂ 43.8 LBS () SINGLE TANK LIFETIME 197 GET @50
 PRESENT AVERAGE USE RATE 0.19 LBS/HR
 O₂ 521.3 LBS () SINGLE TANK LIFETIME 200 GET @50
 PRESENT AVERAGE USE RATE 2.14 LBS/HR

WATER

POTABLE 103.2 %
 WASTE 55.8 %
 WASTE AT 85% AT 56+02 GET
 NEXT DUMP AT 51+45 GET

FLIGHT DIR MISSION LOG	DAY	REV	PG 88
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	More TV recording at MAD		
	Told him to show us the water preparation during the afternoon TV.		
48+02	Gene thinks he can see SIVB.		
48+15	ECS redundant comp. ✓		
X	2nd Main reg dipped as before (82 PSI)		
	Secondary loop OK - powering it down		
	Retro - 6 fps to tweak up flyby that is onboard.		
	Madrid TV tapes will be brought back by courier.		
	<u>Side</u>		
	MCC ₃ = 7 fps MCC ₄ = 2.9 fps.		
	LOT w/o MCC ₄ acceptable		
	SIVB orbit essentially unchanged.		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
--------------	--------------------------------

	Y 270 } 51 just the lower
	P +30 }

49455	More TV recorded at GDS - will be playback later.
-------	--

50436	Suggested to crew that we just stay in PTC - can't do transmission cal if we do.
-------	--

Mission rule summary update.

Told crew we are go w/o transmission bias - stay in PTC.

50459	Gene says even with squelch on he can hear shift creaking in background when being lock - says it is acceptable and actually a good cue.
-------	--

FLIGHT DIR MISSION LOG	DAY	REV	PG 90
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
51/10	Fixed a thruster		
	$\begin{array}{r} 51:10 \\ 29:53 \\ \hline 21:17 \end{array}$ between firings		
	Seems to be wandering off in yaw and constantly firing thrusters.		
51+25	Told him to stop PTC - hold manually at $90^\circ \theta$, 0 roll, 307 roll		
	θ 0237 } HGA \angle 's ψ 265 }		
51+29	Auto maneuvering to 90, 0, 307		
	<u>Fids</u> $MCC=3 = .8$ fps $MCC=4 = 3.6$ fps LOI still can fire 60.7 PC		
51+35	In altitude		
51+39	Doing P52		

FLIGHT DIR MISSION LOG	DAY	REV	PG 91
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	P52 torquing C's small and torqued out.		
51+58	Doing trunnion bias cal		
	89997 bias - same on two passes		
	89992		
	89995		
	He's looking 89992 as a bias		
	52+06 P27 update		
	^{Optics} Eyepiece had floated off behind Gene's sleeping bag - had to scramble around, and found it.		
52+27	Water dump complete - started at 52+15		
52+40	Advised crew that trunnion bias probably did not get in - no problem just advised him. Bias is so small.		

FLIGHT DIR MISSION LOG	DAY	REV	PG 92
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
53+40	TV		
54+09	Starting PTC		
54+35	Disable B/D vice		
54+38	Starting Roll - looks		
	V-34 - ?? <u>Verb 48</u>		
	ACT RCS DAP -		
	V21 N 01 - then Do V-48 *		
54+18	Going to Omni Control from Ground		
	Conversation @ 8pm.		
	SSR - Guidance SSR -		
	GNC - SSR - GYN CSB		
	FAO - CMS instructor.		
55+09	New Moon -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			93
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Crew fine - 8 hrs sleep -		
	Water consumption 7.5# -		
	3.5# yesterday		
	to Crew		
	✓ ① - H ₂ heaters - #1 Auto, #2 - OFF		
	② Comm Mode same as last night		
	③ - Planned to use omni's		
	④ Trig info -		
	⑤ Consumables look good		
55+57	H ₂ heater Conf to crew		
	Lost lock with s/c - switch to omni B		
56+15	Comotal Discussion - didn't take ★		
56+23	Omni B switch normally - ?		
	No MeCa		
56+48	56+00 Batt.c - 36.8 ✓	Dos - CDR 26032	
	A 37.0 ✓	PRD	CMP 05032
	B 37.0 ✓		LMP 15035
	Res A 86 %		
	B 86 %		
	C 91 %		
	D 87 %		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
--------------	--------------------------------

Waste dump @ 50 hrs - Done -

LOI squared away

Reg B is still funny

SIVB Comments

CM

Retro - Fly by still good.
 Pc+2 maneuver -
 3pps

Fido - Pc - 60.7 - settled
 No MCC₃ - still talking
 about MCC₄ - ? to give desired
 Pc 3.9 in
 PROCESSORS

EECOM

① Power OK, Batt A - 39.5 - will term
 B - 35.1 ah total 112. ah

② FC - H₂ purged @ 42 hrs
 Did not purge O₂

③ Main Reg check - was low
 Sec loop - OK

Waste water dump - 85% 84 hrs
 Reserve evap @ 73+30

④ H₂ pressure - will do same - Tank₂ - OFF
 Tank₄ 0272



CSM CONSUMABLES STATUS

GET 54+00

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>258</u>	<u>257</u>	<u>258</u>	<u>262</u>
FLT PLN MARGIN	<u>26</u>	<u>17</u>	<u>22</u>	<u>24</u>
PHASE REDLINE (LOT)	<u>64</u>	<u>72</u>	<u>71</u>	<u>74</u>
RNDZ REDLINE	<u>172</u>	<u>184</u>	<u>182</u>	<u>186</u>
ΔV CAPABILITY	DAP <u>53</u>	SCS <u>42</u>		

SPS

TOTAL Wpu 39503 LBS/ 98.5 %
 ΔV CAPABILITY DOCKED 5572 fps UNDOCKED 10093 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 100 fps
 BURN TIME REMAINING 590 SEC

BATTERY STATUS

A ON chg Ah B 35.1 Ah C 38.2 Ah
39.5 TOTAL 112.8

CRYOS

H₂ 42.06 LBS () SINGLE TANK LIFETIME 201 GET @50amps
 PRESENT AVERAGE USE RATE .1936 LBS/HR
 O₂ 504 LBS () SINGLE TANK LIFETIME 204 GET @50amps
 PRESENT AVERAGE USE RATE 2.1 LBS/HR

WATER

POTABLE 102 %
 WASTE 18 %
 WASTE AT 85% AT 78+44 GET
 NEXT DUMP AT TBD after LOT GET

MISSION NOTES

CREW STUFF - 56+01 APPROX

① COMM MODE SAME AS LAST NITE - OMNIS -
S-BAND NORMAL VOICE MODE OFF - CALL ON DOWN VOICE
B/W IF NEED HOU - EXPECT HBL 50% of time

② TRAJ GOOD - IF NO LOI-5hr - man expect about 13 fps
fps to GET in middle of Corridor. IF LOI-5 hr burn
done - expect 3 fps to get to middle of Corridor -

③ Consumables great - Single tank to 200 hrs @ 50 amp
Batts about ~~being~~ ~~char~~ red line - can go even if
charger fails

3A - No MCCs unless something - Sleep until awakened

④ Exercises info - - 71 hrs

SITE/ACQ/LOS FLIGHT EVENTS/HISTORY/BRIEFING

Comm - Omerie's

DXP - GDS System 2 to System 1 *
- Not to make mult. hard copies
Procedures for DOI playback procedures *

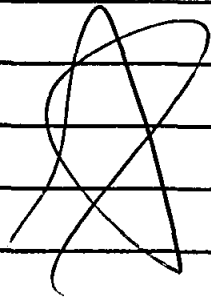
FAO - Check on LOI effect

Disable B/D roll vice A/c

RCS OK

Pippas

Crypto forgoing - P-52's during

FLIGHT DIR MISSION LOG	DAY	REV	PG 94
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
56+49	N ₂ + O ₂ fan cycle		
	No Exercises yet - will do tomorrow		
56+53	Lost GDS line temporarily		
	Passed Crew Stuff - Crew ready for Red		
	Guidance wants to change page		
	162° 11' W - NEW LOI point DOI time 99:45:19 old was 1.7° E of this DO.		
	A-8 - Near Perigee		
	A-10 - Near apogee		
	Lunney will be home if anybody wants her		
	HO 27869		

Flight Director

Apollo Ten weather Status

prepared 0500Z 21 May 1969

Conditions in general are forecast satisfactory for all areas of concern.

Forecast conditions: Atlantic partly cloudy skies, winds 10-12 knots,
seas 3-4 feet and temperatures 72 degs.

Pacific cloudy, wind 10-15 knots, seas 3-5 feet,
temps 72-76 degs and widely scattered shwrs.

EOM outlook - satisfactory.

Carter

FLIGHT DIR MISSION LOG	DAY	REV	PG 95
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<p>Grumman Recommendations to Activation</p> <p>(1) Check list - 5 have been</p> <p>(2) ZEB - presented to crew and are</p> <p>(3) light not significant enough to include or have been rejected - FAO has list - I am satisfied they are O.K.</p>		
	<p>USIS</p>		
	<p>Moon may be noisy</p>		
61+05	<p>Talked with Hunter @ CRO told him we were planning B+W TV and would get crew to do their thing but not to make PAO release of this</p>		
61+07	<p>PSC looks like it diverged to $\pm 20^\circ$ and has now come back in - GNC expects it to go back out to $\pm 25^\circ$ in 5-6 hrs then come back in, then hit limit on next excursion</p>		
61+05	<p>Trag down back up to 60 NM - doing well</p>		
61+12	<p>Retro needs to be ready at regular time with P_c+2 hr PAD</p>		

FLIGHT DIR MISSION LOG	DAY	REV	PG 96
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
61+13	- Leg problem - everyone thinks legs are good - issue closed - have looked at data from chamber		
	.67 #/min		
	90 to 110 psi preflight now think 90 is too high		
	H ₂ tanks doing fine -		
61+27			
61+50	Entered MOON'S SPHERE OF INFLUENCE * (AFTER Much Argument)		
62+28	yaw - 21.7°		
62+34	pitch - 20.8°		
62+ 40	yaw + 21.8°		
62+46	pitch +24.2°		
62+52	yaw - 24.3°		
62+58	pitch - 22.6°		
	5.7 2 48		

- pitch = 7.8 ^{0.24} in/min
+ pitch
- yaw = 2.6°
+ yaw = .5°

CSM CONSUMABLES STATUS

GET 63400

SM RCS (LBS, USABLE)

QUAD	A	B	C	D	
Wpu	<u>258</u>	<u>255</u>	<u>257</u>	<u>259</u>	
FLT PLN MARGIN	<u>+27</u>	<u>+15</u>	<u>+23</u>	<u>+23</u>	<u>46</u> <u>42</u> <u>88</u>
PHASE REDLINE (L0J)	<u>64</u>	<u>72</u>	<u>71</u>	<u>74</u>	
RNDZ REDLINE	<u>168</u>	<u>180</u>	<u>177</u>	<u>182</u>	
ΔV CAPABILITY	DAP <u>55</u>	SCS <u>46</u>			

SPS

TOTAL Wpu 39503 ~~3757~~ LBS/ 98.5 %
 ΔV CAPABILITY DOCKED 5572 fps UNDOCKED 10093 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 100 fps
 BURN TIME REMAINING 590 SEC

BATTERY STATUS

A 39.5 Ah B 34.5 Ah C 38.2 Ah

CRYOS

H₂ 40.9 LBS (+0.1) SINGLE TANK LIFETIME 208 GET
 PRESENT AVERAGE USE RATE .184 LBS/HR
 O₂ 495 LBS (+18) SINGLE TANK LIFETIME 225 GET
 PRESENT AVERAGE USE RATE 1.9 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 40.6 %

WASTE AT 85% AT _____ GET
 NEXT DUMP AT _____ GET

} SHOULD'NT HAVE TO DUMP UNTIL LATE IN LUNAR ORBIT OR TEL (DEPENDING ON H₂O BOILING)

WEATHER FORECAST

SHEET NUMBER 12

T+70 Update

DATE/TIME OF PREPARATION:

21 MAY 1500 GMT

1000 CDT LOCAL

LANDING AREA	CLOUD BASE/COVER	WIND DIR/VEL DEG/KTS	VSBY-MI/ WAVE HGT-FT	ALTIMETER	REMARKS
	<u>PC+2</u>				
<u>MPL</u> +118 GET	2000 SCTD / HIGH BRKN	090/12	10/4	29.85	WIDELY SCTD SHWS <10% AREA
<u>AOL</u> +132 GET	1500 SCTD / HIGH SCTD	160/10	10/3	30.03	WIDELY SCTD SHWS <10% AREA
	<u>EDM</u>				
<u>MPL</u> +192 GET	1800 SCTD 10,000 BRKN HIGH BRKN	090/15	10/5	29.88	WIDELY SCTD SHWS <10% AREA
<u>AOL</u> +181 GET	2000 SCTD / HIGH SCTD	090/15	10/4	29.97	
	<u> </u>				

Flight Director

Apollo Ten weather Status

prepared 0500Z 21 May 1969

Conditions in general are forecast satisfactory for all areas of concern.

Forecast conditions: Atlantic partly cloudy skies, winds 10-12 knots,
seas 3-4 feet and temperatures 72 degs.

Pacific cloudy, wind 10-15 knots, seas 3-5 feet,
temps 72-76 degs and widely scattered shwrs.

EOM outlook - satisfactory.

Carter

PETE -

SAVED A COPY IN CASE 'UNCLE MILTIE'
FORGOT TO GIVE YOU THE ORIGINAL.

WE ARE REVISING UPDATES NOW & FIRST
INDICATIONS ARE THAT THERE WILL BE
NO ^{SIGNIFICANT} ~~NO~~ FOR CHANGES TO THIS ONE.

* If crew wakes up before 70+00 these items may be done at their convenience.

FLIGHT PLAN UPDATE	
TIME	ITEM
	DELETE ALL MCC ₄ Activities
* 70+10	F/C O ₂ PURGE
* 70+30	POST SLEEP Checklist
70+45	P 27 Update
	STATE VECTOR
	L L S 2 REFSMATT
	PCT+2 PAD
	PRELIM LOI MNVR PAD
	TEI ₁ PAD
	TEI ₄ PAD
	TV ATT
* 70+50	CANISTER CHANGE
71+15	P 52 (OPTION 1 - PREFERRED)
	ALIGNS IMU to LLS 2
	REFSMMAT
	This puts us back on nominal
	time line with ECS REDUNDANT
	COMPONENT CK at 71+55.
	Since LOI, is now about 11
	minutes later than pre-flight, all
	lunar orbit activities will shift
	to 11 min later than the flight plan

FLIGHT PLAN UPDATE

TIME	ITEM
	ADD
73+15	Verify PRIMARY EVAP
	WATER CONT IN <u>AUTO</u>
	(PANEL 382)
73+20	RECOVER PRIMARY EVAP.
84+20	Change BATT A charge
	to <u>BATT B</u> charge.

FLIGHT DIR MISSION LOG	DAY	REV	PG 97
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
63+04	yaw +22.3 B		
63+10	pitch +24.1		
63+16	yaw -23.4		
	Australian TV can handle color unless some frames are unbalanced - B+W is better -		
63:40	ORANGE ON		
	EECOM -		
	1. Cryo H ₂ Tk 1 - Htrs AUTO		
	TK 2 - Htrs OFF		
	Will switch at wake up.		
	2. Main Regs showed same characteristic but they are good		
	3. Will service WB at 73:30		
	4. Getting data showing temperature data for 1 rev w/o Pri Evap.		
	5. Still ON OMNI'S - 60% HBR		
	6. Can GO to 84 hours before we might need to dump H ₂ O, well part LOI ₂		

FLIGHT	REV	PG 98
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING	
	G+C Review	
	1. SMRCS + by 88 lbs	
	2. CMRCS No Change in status	
	3. PIPAS + Gyros are still great	
	4. PTC attitude excursions are a little more erratic.	
	<u>FIDO</u>	
	- hp = 61 nm @ GET 76:10	
	- MCC4 = 3.5 fps	
65:40	Discussed hpm predictions with Bill Wallenkampf (MPB). His opinion is that hpm = 61 nm ± 2 nm. Unless this changes in the next 2 hours we will not do MCC4.	
66:34	hpc = 61.09 nm ; 76:00:10 sec	
67:00	HBR 70% to 75% HSIK MAD 55% - 60% HBR	
68:34	hpc = 61.89 76:00:12 3 hours more tracking since last update	

FLIGHT DIR MISSION LOG	DAY	REV	PG 99
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
69:45	Uplinks at MAD ready to go		
	St. Vetr, Refsmat, Clock synch		
	Will subtract 4 centiseconds from current		
	onboard clock		
69:57	Crew Wake Up		
70:10	MAD not keying. Trying to use		
	manual key, trying as backup		
	"GOSS CONF"		
70:15	Comm reestablished and we have		
	a backup line		
70:37	Post sleep Checklist		
	Cryo Config: H ₂ tank 2 Htrs - Auto		
	H ₂ tank 1 Htr - OFF		
70:59	UPLINKING state vector, Refsmat		
	+ Clock Update		
	Stop Roll 330°		
	Pitch to 030°		
71:23	Starting Redundant Component Check		
	Main Regs performed the same as		
	before		

FLIGHT DIR MISSION LOG	DAY	REV	PG 100
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
71430	BLACK TEAM ON		
	75+55 + 53.71 TIG LOT,		
	Fido - increase of .6 mile in PC.		
	PC of 62.5 - checking on bias		
	of sites.		
	Guide - all OK		
71439	Crew can see across and other		
	constellations.		
	Best estimate of PC 62.5 miles - Fido		
	Small torquing L's		
71456	High Gain Key		
	72+14 Prime site ↔		
	73+23 wing marking		
	72+49 210 Marking		
	Briefed crew on antenna acq. status		
	w/ GDS.		

CSM CONSUMABLES STATUS

GET 72

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>259</u>	<u>255</u>	<u>257</u>	<u>260</u>
FLT PLN MARGIN	<u>35</u>	<u>22</u>	<u>26</u>	<u>29</u>
PHASE REDLINE (LOD)	<u>64</u>	<u>72</u>	<u>71</u>	<u>74</u>
RNDZ REDLINE	<u>164</u>	<u>177</u>	<u>174</u>	<u>180</u>
ΔV CAPABILITY	DAP <u>55</u>	SCS <u>46</u>		

SPS

TOTAL Wpu 39503 LBS/ 98.5 %
 ΔV CAPABILITY DOCKED 5572 fps UNDOCKED 10093 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 100 fps
 BURN TIME REMAINING 590 SEC

BATTERY STATUS

A 37.9 Ah B 32.3 Ah C 38.3 Ah
 TOT 108.5

CRYOS

H₂ 38.99 LBS () SINGLE TANK LIFETIME 191 GET @50
 PRESENT AVERAGE USE RATE 0.190 LBS/HR
 O₂ 479.5 LBS () SINGLE TANK LIFETIME 219 GET @50
 PRESENT AVERAGE USE RATE 1.917 LBS/HR

WATER

POTABLE 104 %
 WASTE 67.1 %
 WASTE AT 85% AT 76+42 GET
 NEXT DUMP AT TBD GET

FLIGHT DIR MISSION LOG	DAY	REV	PG 101
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Common real bad w/Tom		
72+14	<div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;"> distances & velocity 208,950 ft from Earth, 3,013 fps rel to earth 9,813 ft from moon. </div>		
	Will get external TV shot at 72+20		
	TV on at 72+18 - no acq at GDS		
	290.6 perihelion is tottering		
	76+00+14 time for P21 run.		
	P21 perihelion 61.8 NM - great		
	GDS acq was in error.		
72+35	GDS locked solid		
72+38	TV on the earth		
	TV looks OK on 85' dish - a little noisy.		

FLIGHT DIR MISSION LOG	DAY	REV	PG 102
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
72+54+49	Just went into darkness		
73+02	REV 1 Map update		
	LOI about card update		
	Drifting toward HGA limit		
	Going toward 601 alt		
73+25	Reservicing wags.		
	Completed servicing		
73+31	P27 update		
	State vector update		
	target load		
	250 min ^{less} min stop 5.6 vice 4		
73+48	PC at 61.9 latest data		
	SPS pressure est. 1600 PSI @ -10°F		

FLIGHT DIR MISSION LOG	DAY	REV	PG 103
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Mission timer lock - right w/ us		
*	Span concurs with our ball valve procedure for CO1 burn.		
	Good timing C's		
74+18	May get inline heater cycle on primary loop.		
	SXT star ck great		
	74+50+11 sunrise 74+50+11 sunrise		
	60X170 after LOI, - Fido		
	Circled ^{eyes for} at 71+00 - do we want to do now - yes -		
74+45	Go for LOI		
	SBand aux - Down since 6/11/74 } Tape refeed - FWD }		

FLIGHT DIR MISSION LOG	DAY	REV	PG 104
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
74+50+15	Sunshine on time		
	Omni C for HBR		
75+29	P 30 / P 40		
75+35	-6 min and waiting -		
	Still can't see the moon.		
75+48+24	LOS right on time		
76+23+09	LAN AOS		
76+24+45	We have arrived		
	98 to 103 Pc increase during		
	beam smoothly		
	200 dec went to 300 went to		
	169.1 X 59.6 onboard		
	Everything ok w/SPS		

APOLLO 10 MISSION

Fourth Report

(48 through 72 hours)

The mission has continued to progress satisfactorily through this period. Crew performance has been excellent, and the flight plan has been followed closely.

The midcourse correction planned for about 54 hours was not required. At 72 hours, the predicted altitude and time for the point of closest approach to the lunar surface were 62.5 nautical miles and 76:00:14.

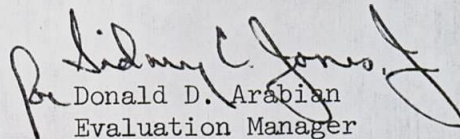
The rate of leakage from the low-pressure helium manifold in command module reaction control system A has apparently decreased, as would be expected for the reduced pressure, which has dropped from 49 psia at launch to 35 psia at 72 hours. The pressure in system B has been stable at 37 psia, verifying that the oxidizer isolation valve is not leaking. The leak in system A will not constrain operation of the system.

During the crew sleep period, command switching between omnidirectional antennas B and D allowed reception of high-bit-rate telemetry 20 to 50 percent of the time, depending on the look angles. A 5-minute color television transmission was received and recorded at Goldstone beginning at 49 hours 54 minutes. A second transmission was received between 53 hours 35 minutes and 54 hours. S-band squelch, available for the first time on this mission, has been used satisfactorily for the past two days.

Vehicle attitudes were stable throughout the third period of passive thermal control, and no thrusters fired during the crew sleep period.

The crew reported difficulties in removing hydrogen gas from the water in the water bag; they stated that gas bubbles formed one large bubble in the middle of the water in the lower chamber of the bag when the bag was swung. This condition was verified during a television transmission. However, the bag did not contain enough water to allow hydrogen gas to escape from the water in the lower chamber into the upper chamber. Ground tests are being conducted to verify the design and operation.

Consumables usage remains well within predicted limits; 122 pounds less propellant has been used from the service module reaction control system than predicted. By use of the passive thermal control technique, spacecraft temperatures have been maintained well within expected limits.


Donald D. Arabian
Evaluation Manager

APOLLO 10 MISSION PROBLEM LIST

May 21, 1969

Handwritten initials

ITEM NO.	VEHI CSM	LM	DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
1	X		(PRELAUNCH) Command module reaction control system A Helium manifold pressure decay	Leak rate remaining constant. Tests indicate no degradation due to shock from 50 to 300 psig for leak in tubing.	Ferguson		
2	X		(PRELAUNCH) Fuel cell 1 oxygen flowmeter failed	Caution and warning was affected when switching selector from fuel cell 2 to fuel cell 1. There is no constant caution and warning.	Ferguson Kingsley		
3	X		(PRELAUNCH) Command module reaction control system B helium manifold pressure abrupt drop from 44 to 37 psi when propellant isolation valves opened.	Burst disc on oxidizer system ruptured.	Ferguson	CLOSED	
4	X		(PRELAUNCH) Suit loop water separator breakthrough	Change in wick wetting technique was successful	Hurt	CLOSED	
5	X		(GET 00:07:00) Primary environmental control system evaporator dried out.	Switch to secondary evaporator at 00:15:00. Primary evaporator re-serviced at 73:15:00.	Hurt		
6	X		(GET 01:47:00) Thin white line on right hand side window (top to bottom).	Await postflight debriefing	Wade		
7	X		(Approximate GET 02:38:00) Crew reported high frequency vibration prior to completion of S-IVB translunar injection firing.	Data from spacecraft shows about 16 Hz, 0.1g peak-to-peak. Rates show 0.4 Hz, 0.1 deg/sec. No significant vibration.	Wade	CLOSED	

APOLLO 10 MISSION PROBLEM LIST

ITEM NO.	VEHICLE		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
8	X		(Approximate GET 02:36:00) High oxygen flow caution and warning during translunar injection firing Cabin oxygen regulators operated at same time.	Caused by combined flow of cabin purge and make-up oxygen by the cabin pressure regulator	Hurt	CLOSED	
9	X		(GET 10:20:00) Carbon dioxide partial pressure readings 1.2 mm Hg; should be lower	Readings are not consistent with anticipated values when cartridge changed.	Gillen		
10	X		(GET 24:06:00) Program alarm 122 occurred while or immediately after the crew was observing the earth through optics	System analysis to determine possible causes	Hanaway		
11	X		(GET 23:47:00) (48:20:00) Environmental control system oxygen manifold pressure dropped to 75 psi (should be 100) for about 3 seconds during redundancy checks.	One regulator supplying the demand of two emergency repressurization regulators wide open will drop manifold pressure to 72 psi as measured in tests. There is also considerable scatter of the manifold pressure, as indicated from all available data. No abnormal condition is indicated.	Hurt		Test Change Notice to be prepared to test system same in ground tests as in flight for 107 and subs.
12	X		(GET 32:00:00) Water/gas separator does not operate satisfactorily.	Tests in progress at MSC to determine best procedure.	McAllister		
13	X		(GET 26:28:00) Digital event timer on panel 1 jumped 2 minutes during countdown prior to first midcourse correction (second planned correction).	First time minutes jumped. Circuit study and test in progress.	Lattier		

APOLLO 10 MISSION PROBLEM LIST

ITEM NO.	VEHICLE		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
14	X		(GET 03:27:00) H-film coating on forward hatch flaked off during lunar module cabin pressurization.	Fix H-film on hatch for 107 and 108. Film is no longer a thermal requirement. Removed from 109 and subsequent per CCB.			

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

Brownish gray -

Can see Sea of Ceres

76+35

Evap is ~~being~~ boiling

76+49+20 LLS #1, longitude.

8. 60.6 X 170.1 after 8 min of track

76+53+15 LLS #2

US #1 at Oklahoma Hills -

Onboard block data is OK
Small midcourses for TEI₁ & TEI₄

BR switch to "low"

Crew wants to know what to
do with oxid flow valve.

Copernicus by earth shine

SPAD

Flight Director

5/21/69

POGO STATUS REPORT

The Apollo 10 spacecraft measurements during S-IC boost showed little evidence of POGO, with peak CM longitudinal oscillations of 0.1g immediately prior to CECO. The longitudinal oscillation between CECO and OBECO attributed to POGO by the crew was a 5 Hz transient response from CECO, with a peak CM longitudinal amplitude of 0.45g. The maximum negative CM longitudinal acceleration at OBECO was -0.6g compared to a predicted value of -0.63g.

The launch data available at this time cover only 270 seconds of S-II boost. The longitudinal oscillations in the CM were less than 0.1g peak during this period. Telemetry data from Bermuda covering all of S-II and S-IVB boost will be available 5/22/69.

During the TLI burn, longitudinal and lateral CM accelerations were less than 0.1g peak-to-peak. These accelerations were at a frequency of 15 Hz and occurred just prior to cutoff. It should be noted that the crew may have sensed approximately twice these acceleration levels due to amplification between the accelerometer location and crew couch in this frequency range.

Ronald C. Wade
RCW

FLIGHT DIR MISSION LOG	DAY	REV	PG 106
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
77+11	Doing P52		
	GDS command computer is loaded		
	with TM program. MAD is active		
	for command		
	Small torquing C's		
	P52 complete		
	Can see a lot of detail w/ earth shine		
	Water boiler may be torquing		
	is off a little.		
	Told him to take us back to		
	000 gaw.		
	170.6 X 59.7 track		
77+32	Need to dump waste water		
77+33	Dumping water		
	Stopped dump		
	LOS on time		

FLIGHT DIR MISSION LOG	DAY	REV	PG 107
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Fido - going for 60.1 circular		
78+31	Acq. Haw, GDS, MAD		
	Reacq mode worked OK.		
	Could not get HBR command in - had to have crew do it.		
	Had crew go to up then reset - then to normal.		
78+41	Evap has dried out - told him to close back pressure valve.		
	Bringing down uplink subcarrier		
	GDS had a command problem. Had to do w/ sub bit encoding.		
	Told crew to go "normal" and "primary" on dist flow valve		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
--------------	--------------------------------

Finally got ~~the~~ GDS configured.

LOI₂ pad
TEI₅ pad
Rev 3 map update

Bluish bubble after LOI Burn floating around LM - probably water from somewhere

79+14 Can see solar corona - really pretty

45 sun disks went down

Small torquing L's in P52

~~79+28~~ ~~TEI~~ ~~pad~~

79+32 Lost high gain lock when maneuvering to burn attitude

79+36 getting data again

Think that saw CP1 and CP2 on bockside.

FLIGHT DIR MISSION LOG	DAY	REV	PG 109
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
★	Will delay canister change and O ₂ purge until after the PM activities. <u>Milton - catch this before sleep.</u>		
79+48	Going to P40		
	LOS on timer		
	FAO - 12 Min - -		
	Telcom - AP reading before pressing ★ look for Mylar in Dump valve		
	Control - M/C		
	EECOM - loop temp looks O.K. - ' ★ 85% @ 99 hrs		
	Do		
	Network - Ready for T.V.		
	GDS reverse		
	GNC - Crew - description PUGS ★		
	Retros - to LOI ₂		
	Fido - Traj nominal		
	Guidance -		
	Surgeon		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			110
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
to crew	① LOI ₂ burn report to		
	② TV		
	③ Note LM/CSM & P before look for Mylar in Cabin Dump valve -		
	④ Map updates & Landmark tracking		
80:40	AOS - AAU, GDS		
80:41	- voice AOS		
	LOI ₂ - good O/T		
	14 Sec -		
	+05		
	-03		
	-04		
	ΔV_c - 5.6		
	FR 34.9		
	OX 37.1		
	600 unbal increase		
	Pc - 103 Psi		
	61.2 x 60.0 NM orbit		
80:43	V66 not yet done - OK now		
80:44	TV coming down now		

FLIGHT DIR MISSION LOG	DAY	REV	PG 111
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		
80+45	B+W TV in -		
80+45	62.5° in bri loop -		
80+45	color in		
80+47	N Try other ALC now inside		
80+48	outside - better		
80+53	focus on infinity ✓ - asked to go to full OFF on zoom - out		
	8 min radar confirm O/B vector -		
	EECOM - temp - peaked @ 64°		
	Windows - RTV -		
	Need color chart		
81+06	TEI 5 is 60 - with 16pps ★		

FLIGHT DIR MISSION LOG	DAY	REV	PG 112
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		
81+08	F-2.2 - +inside on ALC		
81+14	Got color chart - Passed TE15 info -		
81+17	- told about LM/CSM ΔP -		
	98+15 hrs for next TV		
81+19	PADS up - ✓		
81+20	Doing P-52 2ND PASS		
	Pre loop - 65° RAD out - peaks @ Sub Solar - point limit is crew comfort - Suit temp 64° Thinking about powering down 7amps worth 1 ST peak 62°		
81+34	Pressures are equal - hatch open - getting shake out of way		
	Advised about Roll cal + LM Power		
81+43	LMP going off the air - LMP - cleaning Mylar out of valve - looks like Cotton tastes like fiberglass - Very much easier in zero		

GNC-03 12
DAY P-22

TERCOM -10
REV Control-13

PG 113 12

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	AOS 82+38:52		
	LOS 81+53		
	AP - starting		
81+49	0.1 - Roll CAL		
81+52	Much insulation all around tunnel - Problems		
	① insulation		
	② P-22		
	③ Pri loop - expect to have hack at Next Pass		
	④		
82+31	Wet Kleenex to sop up insulation?		
82+41	LM AOS Data		
	<u>She - 798 Psi - Temp + Pressure</u>		
82+45	1 hour on no. Suit compressor ops		
82+46	Charlie Brown - in land mark tracking - Smoopy - loud + clear		

FLIGHT DIR MISSION LOG	DAY	REV	PG 114
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
82+48	82:45:40 - last mark		
82+50	Snoopy - weak -		
	Back-up down voice		
	C/B Comm - not		
	Cannot copy Snoopy on Down Voice Bju		
	No Mod on TIM Down link		
	CSM		
	Try - back up mode		
	C/B -		
	-45 Suit fans - ^{wet} - Terry cloth -		
	Trying CDR audio panel now		
83+02	Houston Snoopy - loud & clear		
	Down voice Back-up in off. ★		
	PTT - OK		
	VOX - OK		

FLIGHT DIR MISSION LOG	DAY	REV	PG (115)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
83+04	- Pri loop - Stabil as before		
	- Still in Down Voice Back		
83+07	Omni Voice Test - OK -		
	No Jay on HBR -		
	H ₂ - Tank 1 - heat Auto }		
	H ₂ Tank 2 - OFF }		
83+15	Dap Configured OK.		
	C/B on HGA		
	⊙ Jets are Disabled -		
	Backup Down - CSM on both		
	HGA - CSM		
	Auto 3.2 to 3.6		
	Landmark tracking OK		
83+20	S band antenna moves whole vehicle		
83+20	- Pod + accept -		

FLIGHT DIR MISSION LOG	DAY	REV	PG 116
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Verify not in Down voice B/U - Amin Down Voice B/U B going to Normal voice		
83+24	Missed FM test first time Hatch		
	(83+50) - C/B - 10° two adj disable Quads B+C use B/D Roll		
	FM - now O.K.		
	Comments on Mark - taking		
	① Level map up -		
	② bandage cabin Fan		
	③ wet stuff on Suit hoses tape on hatch		
	Dump Complete -		

FLIGHT DIR MISSION LOG	DAY	REV	PG <u>117</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Control - ① Crew verify AGS Deachand min - should be min		
	② Cycle switch		
	② APS oxid tank press 17psi onboard read out		
	close 16 - row 1 Display eng overid logic		
	P11 = switch (ap temp grow) to ASC -		
	Still in relay mode - according to Not work		
83+39	High O ₂ flow =		
	Reading 4X4		
	✓ Glycol temp - read out on board zero - 0/B		
	GNC - Jet Config -		
	go - B/D roll		
	Oxid 180 psi -		
83+50	- LM LOS		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

TELCOM -

(1) - Communications tests

(2) - System

Control - (1) got answers -
(2)

GNC - (1) PUGS

EECOM -

(1) O₂ flow rate high
cabin suit, TM pressure(2) H₂ tanks may be switched(3) Pri loop temps stabilized
@ 65

(4) Insulation

Land marks - get two groups together

SITE/ACQ/LOS FLIGHT EVENTS/HISTORY/BRIEFING

AOS Notes POD + Accept

- ✓ ① LM Communications is good -
~~is~~ better than expected
 LM Prop - looks good
- ✓ ② Words on O₂ flow rate
- ✓ ③ LM data - including power transfer
- ✓ ④ OPS Status
- ✓ ⑤ story on insulation ~~map~~
 ① Repair hatch
- ✓ ⑥ Landmark tracking - done well
 Could spread out ~~later~~ a little more
- ✓ ⑦ Alt plan changes -
 Batt B change ~~via A~~ already told them
- ✓ ⑧ P_{ri} loop - configuration for sleep
 - looks good -
- ✓ ⑨ PUGS - use "in crease" position
 and leave it there for TEL burn
- ✓ ~~⑩ LM~~ High O₂ flow
 LM/CSM ΔP (1.9)
 hatch closure time
 power X-fer on ~~OFF~~

FLIGHT DIR MISSION LOG	DAY	REV	PG 120
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
84+40	A-10 - AOS		
	Insulation in Cabin for 3 days		
	82+29+20 - 2M ON		
	84+32+00		
	Bat C 37.0		
	PymA 37		
	Pym-B 37		
	RCS A 81%		
	B 87		
	C 84		
	D 84		
	H ₂ O fan - #1 Auto		
84+43	Batt B Charge already started		
84+44	Poo + Accepts - starting update of		
	State Vector		
	Normal Radent = .001/hr Snoopy		
	No Change in LM since		
	EPS - Bat 1 - 35		
	2,3,4 - 35v		
	5,6 - 37v		
	low taps		

FLIGHT DIR MISSION LOG	DAY	REV	PG 121
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	CDR 29.02V } Low taps		
	SE 29.00V }		
	Inv high Side green - #2		
	Batt 1,2,3,4 37.8	Deactivation	
	CDR, LMP - 27.0		
	OPS - 5800 psi - OK		
	Stand antenna - fine		
	4.2 on meter -		
	Glycol Temp off scale low whole time		
	LM/CSM ΔP = 1.9 prior to initial pressurization		
	enable-B/D roll re-enable B3, RHC - #2 Direct ^{Power} AOFF		★
84+55	H ₂ tanks Correct - now, RHC OK		
	O ₂ flow high caused by clogged exhaust ^{Suit return valve}		
	hose intake clogged		
	2-3 times per day		

FLIGHT DIR MISSION LOG	DAY	REV	PG (122)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Hatch - high Vel O ₂ ripped it apart have already taped it up		
	have gotten most of the insulation out of CSM from		
85+05	LM - Did drink 1 Water - also got air - lots of it		
	Passed power down list		
	Disable B+C use B/D in Dap		
85+29	PRD CDR 26036 CMP 05036 LMP 15038		
	LMP - 2 Aspirin @ 85+00		
85+49	A-10 Says LM is squared away - will get DAP configured		

FLIGHT DIR MISSION LOG	DAY	REV	PG 123
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
86+35	AOS—		
	A-10 Wants DAP Check - sounds like		
	lots of thruster firings		
	C-3		
	Disable A-2 , B-4, B-2		
	enable A-1, A-2		
	- RCS Thrusters Now Setup correctly		
	Elbp out peaked at 68 this pass		
87+13	B SHe Rise RATE IS SUCH THAT		
	there is no constraint on DPS TEI'S		
	BE , <u>in any mode</u> ★		
87+13	- ATTITUDE HOLD DOES NOT SEEM TO		
	BE WORKING ? ★		
	AGS Dead band Switch is subject of		
	some discussion - Does ACA need to be		
	powered		
	APS oxides - 179 - prelaunch		
	187 - now - 180 - crew - No		
	Sweat		

Flight Director

Apollo Ten Weather Status

prepared 0430z 22 May 1969

Conditions in general are forecast satisfactory for all areas of concern.

Forecast conditions: Both oceans - partly cloudy skies, winds 10-15 knots, seas 3-5 feet and temperatures 72-81 degs. Widely scattered showers both oceans.

EOM outlook - satisfactory.

Carter

MAP UPDATE PAD

MAP UPDATE REV 4
LOS : 81:53:01
150°W: 82:04:48
AOS : 82:39:11

MAP UPDATE REV _____
LOS : _____:_____:_____
150°W: _____:_____:_____
AOS : _____:_____:_____

MAP UPDATE REV _____
LOS : _____:_____:_____
150°W: _____:_____:_____
AOS : _____:_____:_____

MAP UPDATE REV _____
LOS : _____:_____:_____
150°W: _____:_____:_____
AOS : _____:_____:_____

SR 82:00:41

SS 83:13:08

TIME PREPARED _____:_____:_____
INITIALS _____

LANDMARK TRACKING UPDATE PAD

P22	MAN	ACQ	P dn	RO°	YO°
T ₁	82	38	45		F-1
T ₂	82	43	47		
R	000	°P	326	°Y	000
N or S	NM	07	SA	12	TA 20
CP				N89	
LAT					
LONG/2					
ALT					

P22	MAN	ACQ	P dn	RO°	YO°
T ₁	82	55	47		B-1
T ₂	83	00	50		
R	000	°P	274	°Y	000
N or S	NM	30	SA	48	TA 25
CP				N89	
LAT					
LONG/2					
ALT					

Local Vertical - 82+44+37

P22	MAN	ACQ	P dn	RO°	YO°
T ₁		:	:		
T ₂		:	:		
R		°P		°Y	
N or S	NM		SA		TA
CP				N89	
LAT					
LONG/2					
ALT					

P22	MAN	ACQ	P dn	RO°	YO°
T ₁		:	:		
T ₂		:	:		
R		°P		°Y	
N or S	NM		SA		TA
CP				N89	
LAT					
LONG/2					
ALT					

PREDICTED RCS USAGE _____

TIME PREPARED ____:____:____

INITIALS _____

CSM CONSUMABLES STATUS

128 732 128

GET 80

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>247</u>	<u>252</u>	<u>240</u>	<u>254</u>
FLT PLN MARGIN	<u>40</u>	<u>31</u>	<u>30</u>	<u>35</u>
PHASE REDLINE (TZI)	<u>38</u>	<u>52</u>	<u>46</u>	<u>54</u>
RNDZ REDLINE	<u>146</u>	<u>166</u>	<u>154</u>	<u>165</u>
ΔV CAPABILITY	DAP <u>105</u>	SCS <u>81</u>		

SPS

TOTAL Wpu 14651 LBS/ _____ %
 ΔV CAPABILITY DOCKED 2441 fps UNDOCKED 4992 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 4650 fps
 BURN TIME REMAINING 219s SEC

BATTERY STATUS

A 35.4 Ah B 29.2 Ah C 38.3 Ah
 TOT 102.9

CRYOS

H₂ 37.29 LBS () SINGLE TANK LIFETIME 211 GET @ 50amp
 PRESENT AVERAGE USE RATE .19 LBS/HR
 O₂ 463.8 LBS () SINGLE TANK LIFETIME 229.02 GET @ 50amp
 PRESENT AVERAGE USE RATE 1.89 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 31. %
 WASTE AT 85% AT 99+43 GET (NO B.O.I.)
 NEXT DUMP AT TBD GET

MANEUVER PAD

TEI 10					PURPOSE
SPS/GEN					PROP/GUID
+					WT N47
	0	0	NA		P _{TRIM} N48
	0	0			Y _{TRIM}
+	0	0	096		HRS GETI
+	0	0	0	02	MIN N33
+	0	40	54		SEC
+	2	3	6	6	ΔV_X N81
	0	1	7	4	ΔV_Y
+	0	6	0	5	ΔV_Z
X	X	X	NA		R
X	X	X	054		P
X	X	X	NA		Y
+					H _A N44
					H _P
+					ΔVT
X	X	X			BT
X					ΔVC
X	X	X	X		SXTS
+				0	SFT
+			0	0	TRN
X	X	X			BSS
X	X				SPA
X	X	X			SXP
	0				LAT N61
					LONG
+					RTGO EMS
+					V10
			NA		GET .05G

COMMENTS:

GDC ALIGN NA SET STARS

R ALIGN _____

P ALIGN _____

Y ALIGN _____

ULLAGE _____

HORIZON/WINDOW _____

OTHER _____

TEI₉ could be done to 142 hrs

EI 166:49

Can stay in L.O. until TEI₂₄ AND STAY STILL LAND AT 160

13

124

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

88:50

Est Bat B Charge complete at
GET = 103

Control Review

1. No problems

Telecom

1. Comm will be per checklist except use Normal voice vice Down voice Backup
2. Lost some measurements.
3. Roll Cal = -0.1° (60.1°)

ECCOM

1. Bat B. Charging
2. H₂ tank 1 Htrs in Auto
H₂ tank 2 Htrs OFF
3. Leave Pri Erap Unserviced
and OFF line
4. Scheduled Water Dump at
93:40
- 5.

G+C

1. Ring 1 leak rate decreased to .05psi/hr
2. SPS¹ is a fuel rich engine
3. High Differential clutch current
4. PIPA'S + Gyros Still very good
5. Qds B+C OFF

13

FLIGHT PLAN UPDATE

TIME

ITEM

93+45 TERMINATE BATT B CHARGE ✓

93+50 DUMP WASTE WATER TO 36% ✓

ALL LUNAR ORBIT ACTIVITIES
ARE ABOUT 12 minutes
later than the flight plan
NOMINAL BURN TIMES
ARE NOW =

SEP 98-47-16

DOI 99-46-02

PHASE 100-58-25

INSERTION 102-54-37

CSI 103-45-33

CDH 104-43-32

TPT 105-21-01

CSM CONSUMABLES STATUS

GET 87730

1000
6.9

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>232</u>	<u>250</u>	<u>232</u>	<u>250</u>
FLT PLN MARGIN	<u>28</u>	<u>30</u>	<u>26</u>	<u>33</u>
PHASE REDLINE (UNDK)	<u>148</u>	<u>151</u>	<u>141</u>	<u>148</u>
RNDZ REDLINE	<u>89</u>	<u>87</u>	<u>81</u>	<u>88</u>
ΔV CAPABILITY	DAP <u>92</u>	SCS <u>75</u>		

SPS

TOTAL Wpu 13800 LBS/ 35 %
 ΔV CAPABILITY DOCKED 2295 fps UNDOCKED 4677 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 4250 fps
 BURN TIME REMAINING 200 SEC

BATTERY STATUS

A 34.2 Ah B 31.1 Ah C 38.3 Ah
 IN CHG
 EST. FULL CHG = 102 HRS

CRYOS

H₂ 35.3 LBS (-.7) SINGLE TANK LIFETIME 213 GET @ 50 amps
 PRESENT AVERAGE USE RATE .196 LBS/HR
 O₂ 443 LBS (+14.7) SINGLE TANK LIFETIME 229 GET @ 50 amps
 PRESENT AVERAGE USE RATE 1.98 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 43.0 %
 WASTE AT 85% AT 99 GET
 NEXT DUMP AT TBD GET

FLIGHT DIR MISSION LOG	DAY	REV	PG 125
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Telecom		
⊗	Upper Hatch Valve Closed		
	Do Not Pressurize DPS with both systems		
192:15 *	Usable SPS is reduced by		
	500 lbs		
	Delay any changes to LM		
	upper hatch until after we look		
	at LM/Tunnel AP at 97:00		
92:20	SPAN wants to roll s/c 180°		
	to alleviate Thermal problems in		
	He tank for Qd A.		
92:50	Starting on Redundant Component Check		
93:01	Secondary loop is go		
93:08	A10 Will roll s/c 180° when in Sunlight		
	on far side.		
93:15	Set Up H ₂ tank heaters T ₂ - Auto		
	T ₁ - OFF		
93:29	FC Purge Complete, H ₂ line		
	heaters OFF		
	Terminate B + B Charge		

These are
things
turned off

{ Optics Power
Pot: H₂O Heater
GDC



FLIGHT DIR MISSION LOG	DAY	REV	PG 126
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
93:33	Cryo Fans Still On? - No they		
	left them ON		
93:42	LOS		
	CDR & CMP were suited		
	EMP preparing to man the LM		
	Dumping H ₂ O		
	— o —		

CSM - Charlie Brown

FLIGHT DIR MISSION LOG	DAY	REV	PG 127
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
94:29	AOS		
94:30	Uplinking CSM state vector		
	LLS 2 Refrmat		
	CSM DAP UPDATE (IMAN)		
	WT = 36688#		
	P = -0.75 , Y = +0.82		
94:53	STILL IN POO & ACCEPT		
	Went to Block		
95:04	Need to do P52		
	Prog Alarm		
95:20	Enstalling Tunnel Hatch		
	Need to disable Rolljets		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
	CDR + LMP IN LM
94:32	AOS Data No voice, try DVoice Backup Very Bad Voice Com ON Pg 29 - LGC self test GO
94:40	Try ranging switch off No help
94:42	HGA sounds much better HBR data is good. OPS Source Press Gly Temp works is Position 1
*	TVHF A Check not working too
94:55	EMOD IN Progress LGC clock leads by 0.6 sec will update
95:01	Docked Alignment MAD has good EMOD
95:20	Repeated Docked Alignment LM Gyro Torque *S X = -00.73 (Yaw) Y = -00.7 (Pitch) Z = +00.57 (Roll)

CSM - Charlie Brown

FLIGHT DIR MISSION LOG	DAY	REV	PG 129
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
095:38	GO FOR MNVR TO		
	LNDMRK TRKING ATTITUDE		
	O ₂ Flow increasing		
	May not have suit return valve		
	Open -		
95:57	LOS		
96:27	AOS		
	Cannot vent tunnel		
	May have insulation stuck		
	in the vent line		
97:00	CSM tunnel hatch OK		
	Roll Jets Need to be		
	disabled		
	Drift		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			130
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	LGC clock UPDATE Complete		
95:40	5800 psi on both OPS.		
95:56	LOS		
96:28	AOS		
96:46	Uplinking S, V/S & Refsumet & PIPA BIAS		
	Must reverse LM to get LM tunnel hatch integrity check		
	Yaw torquing angle = 3.5°		
	Roll Jets		
97:06	AGS Alignment had an angle error of 20° - Will repeat		
97:12	* Ground Conversation on A/G-1		
97:28	Indication of 1 TCP "ON" B3D		
C	LM S/C Yaw 3.5° More than when LM was manned		

FLIGHT DIR MISSION LOG	DAY	REV	PG 131
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		

MISSION NOTES

LM ACTIVATION FUNNIES GETZ 1:40

① The APS OX PRESSURE ON TM WAS 187 PSI WHICH IS 8 PSI HIGHER THAN AT LAUNCH. THE ONBOARD CREW READOUT WAS 180 PSI (THIS IS FROM A SEPARATE TRANSDUCER). FEEL THAT THE PROBLEM IS DUE TO AN UPPERWARD SHIFT IN THE TM TRANSDUCER.

② The AGS J/B TM POINT INDICATED MAX WITH SWITCH IN MIN POSITION. BELIEVE THIS IS OK - DUE TO NOT HAVING ATCA C.B. CLOSED. WILL BE ABLE TO VERIFY THIS DURING SYSTEMS ACTIVATION WHEN THE ATCA C.B. IS CLOSED THE AGS J/B TM POINT SHOULD GO TO THE MIN STATE.

Hal Loden

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

Nominal Transmission
Zero Transmission

- 1) Delete all V87's
- 2) Substitute Sextant marks
for VHF Data
- 3) Delete V93 @ ^{103:19}(103:07)
- 4) Delete V93 after TPT
(10.5 ²⁰12)
- 5) After 1st MCC take
3 marks before V93

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
	s/c are rolled 3.5°
	more than at the beginning of the day.
	Track Schedule -
	VHF - (File Voice data)
	Roll Angle -
	RCSTCP -
	Valve - Reboating -
	APSR -
	Anything different
	EMU -
	RETRO -
	FIDO - POPS
	GUID - Agree w Tracking schedule -
	- Pitching Angle - P52 -
	- 3 POPS - STATE Vectors -
	- EMAP Pumps GO -
	-
	CONTROL - ALL GO -
	- RCs hot fire - no Pm
	secondary coils -

FLIGHT DIR MISSION LOG	DAY	REV	PG 133
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	B30 - Station -		
	Effect ability to test failed		
	off -		
	AGS may have been K for W or print		
	procedure -		
	RR Self Test -		
	Update pipobias all 3 -		
	RCS OX system B - 167 vid 184		
	5 per compins Xducer -		
	downshift -		
	TBCCOM - VHF -		
	- Cycling of pump press -		
	of good -		
	Try VAF A Simplex - ✓		
	Voice Ranging -		
	B Simplex for PGE -		
	Checking L1e & VAF -		
	GNE - Quap little to -		
	- Nothing for PGE -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		

CSM CONSUMABLES STATUS

GET 98

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>201</u>	<u>245</u>	<u>233</u>	<u>224</u>
FLT PLN MARGIN	<u>11</u>	<u>39</u>	<u>38</u>	<u>20</u>
PHASE REDLINE ()				
RNDZ REDLINE	<u>130</u>	<u>151</u>	<u>138</u>	<u>148</u>
ΔV CAPABILITY DAP	<u>110</u>	SCS	<u>82</u>	<u>1man in CSM</u>

SPS

TOTAL Wpu 13800 LBS/ 35 %
 ΔV CAPABILITY DOCKED 2295 fps UNDOCKED 4677 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 4250 fps BT 240
 BURN TIME REMAINING 200 SEC

BATTERY STATUS

A 33.8 Ah B 33.6 Ah C 38.3 Ah
 TOT 105.7

CRYOS

H₂ 34.67 LBS () SINGLE TANK LIFETIME 215 GET @ 50
 PRESENT AVERAGE USE RATE 1.865 LBS/HR
 O₂ 433.7 LBS () SINGLE TANK LIFETIME 234 GET @ 50amps
 PRESENT AVERAGE USE RATE 1.91 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 29.6 %
 WASTE AT 85% AT 116+37 GET
 NEXT DUMP AT 3:108 GET (Prior to sleep)

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	ECOM - Vent Tunnel for RTM -		
	- Backflow / - compress fault during undocked phase -		
	- Hi Evap is off -		
	- Will use sensor pip'ry'd -		
	Surveys - All so -		
	APD - COM relay tests - MSFN relay -		
	KAD - Qualification - Partial Insertion Sun - will change -		
	CAPCOM - Flash Lite PVH -		



FLIGHT DIR MISSION LOG

DAY

REV

PG

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

FLIGHT DIR MISSION LOG	DAY	REV	PG (135)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
98/26	ADS MAP -		
+33	605 -		
	HBR -		
98/27	Snappy - load & clear -		
	Poo - Pet -		
98/28	PADS -		
	<u>Content</u>		
	PPS - Press good - all good -		
98/28/31	<u>Recom. Gen. Debye</u>		
	TV on -		
	DIF pad -		
98/29	Passing pad		
	TRP		
	B4 Up TRP -		
	Guid - thru to Capt N -		
	SVI Tgt -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (136)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<u>98/33</u>	PDC Abort - Pad -		
<u>98/34</u>	Through in loads		
<u>98/</u>	Feedback -		
	Crowd problem between 600 & 650 -		
	GSFC - ✓		
	Crew wants a / voice -		
<u>98/39</u>			
<u>600</u>	CSM P30 -		
	in att -		
	Checking - 600 no hp -		
	GNE - all sep -		
<u>98/41</u>	New Pad -		
	Voice in Charley - 600 -		
	5:42 - To sep -		
<u>98/42</u>	Expect good trying angles -		

FLIGHT DIR MISSION LOG	DAY	REV	PG 137
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Arctic B 40 - No Altmet -		
	Hasselblad film pack fail		
98/47	CM Sep - -X 2.5.0 -		
98/49	VHF of simplex ✓ Could not get P65 local vertical of 83 tent to agree until unloading -		
98/52	2 pokes in - remote - No radar signal - CM - Houston vector - Manually searching - No lock yet - Telling us to p. to up -		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

No

System Xponder position -

System Test -

CB'S -

Channel A zero flight -

B - zero -


C - zero -

Working when did self test -

Key ~~to~~ per.


CB is in

Recycle per switch -

Works -  Rodriguez

~~99/701~~ .4 miles -

Entered .96 on Range -

 .45 "

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<u>99/03</u>	CMC is yuno		

FLIGHT DIR MISSION LOG	DAY	REV	PG <u>139</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<u>99/04</u>	Washington site -		
	no -		
	Menzies -		
<u>99/03</u>	WAF A Suez Canal -		
<u>99/08</u>	HGA limit -		
	LOS -		
	Go to annis/reach limits -		
	Aft annis -		
<u>99/10</u>	Aft ant - Chaley Brown to Energy -		
	Reminds -		
	BNY 055 to rate 1 or 2 -		
	DV C/G to CSM -		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
--------------	--------------------------------

	A1 - Times -
	CBorn -
WS	<u>WS</u> 16/30

A05	100/24 A05 -
-----	--------------

	if warm / See craft See jump -
--	--------------------------------

	Cabin 74 <u>Suit 57.</u>
--	-----------------------------

99/23	<u>MCG</u> Blahm CMC - A1 -
-------	--------------------------------

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			141
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	40 MIN DATA		
	0400 - 0440		
	All HBR		
	00009		
	-	.663	R ✓
	-	.195	✓
	1	.055	y ✓
	99/38 ✓		
	Check CBR 16 Keoplmy		
	✓ engrave		
	BURN -		
	A1 - No CB popped -		
	B52 - P. Last stop pop CB		
	on panel		
	HQA prints -		
	Go for ROI -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<u>99/37</u>	<u>nc/also for pss</u>		
	<u>What's Pro doing &</u> <u>MCC Integritiy - 3</u>		
	<u>Think it was taking a little</u>		

FLIGHT DIR MISSION LOG	DAY	REV	PG (142)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<u>99/36</u>	Lost HSRK, showed going to LRR RR		
	Test -		
	<u>99/45</u>		
	Valid LRR Test before LOS -		
	99/46 -		

FLIGHT DIR MISSION LOG	DAY	REV	PG <u>143</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Briefing -		
	EMU RETN - F100 - GUP -		
	2 PPS -		
	LHMNAV update STD assuming		
	nominal DOI -		
	CONTROL -		
	DOI - No		
	893 She -		
	Nominal 1000 ps: - Sheflow -		
	40 She - 190 Tank -		
	Plugged - Nominal profiles -		
	210 ps to complete @ 70% -		
	TECOM - Pellwell -		
	GNC - ECOM Topology back -		
	Suzer -		
	All OK		
	Filter may not have been on		
	in Forward Hatch -		
	stored separately		

REPORT ON LM COMMUNICATIONS TESTS

1. S-Band/VHF voice test (6.04.00)
Lo Bit rate telemetry was received about 82:43, however, no voice was received. Later, voice was received but was very poor. At 82:50, voice suddenly improved and the LMP reported that the voice switch had been off and he was now in DN Voice B/V. It is possible that he had been in voice previously and the site configuration was incompatible causing poor voice quality. MCC also suggested going to B/V on the LMP audio center and powering up the CDR audio center, however, before proceeding with this step the LMP realized the voice switch position problem.
2. Omni Voice/TM test (6.07.00)
The voice quality and LBR data was excellent. This mode was predicted not to work but due to this test the mode will be used.
3. Mode 15 test on Omni's
The HBR data was very intermittent in this mode. This mode is not a useful mode at lunar distances.
4. Basic Comm on Omni's
Not sure if voice was heard in this test, HBR data was missing.
5. Steerable Voice/TM test
The LMP did not configure to voice on the voice switch, but stayed in DN Voice B/V causing the HBR data to drop out when the LMP talked. The test then proceeded to the FM Mode which did not work since the voice switch was still in DN voice B/V. MCC advised the LMP to correct his switch configuration; however, he stayed in FM and did not perform the test in PM. At the end of the comm tests the LMP returned to comm basic (6.02.00) and voice and HBR telemetry were excellent.
7. B/V Voice test
It took an unusually long time for the LMP to configure to this mode. When he apparently configured, and the capcom attempted the test, he heard an echo. The echo was definitely coming from the CSM as confirmed by the site. The CSM was probably ahead in the comm test sequence causing the problem. There is no reason to believe the B/V voice test was completed satisfactorily.
8. LM Relay test
The LM relay test was completed satisfactorily. The first time CSM S-Band voice was present, but the second time the CSM voice was not present and the check was good.
9. CSM Relay and MSFN relay tests were scrubbed due to lack of time.

Telcom 5/21
87:54 GET

FLIGHT DIR MISSION LOG

DAY

REV

PG

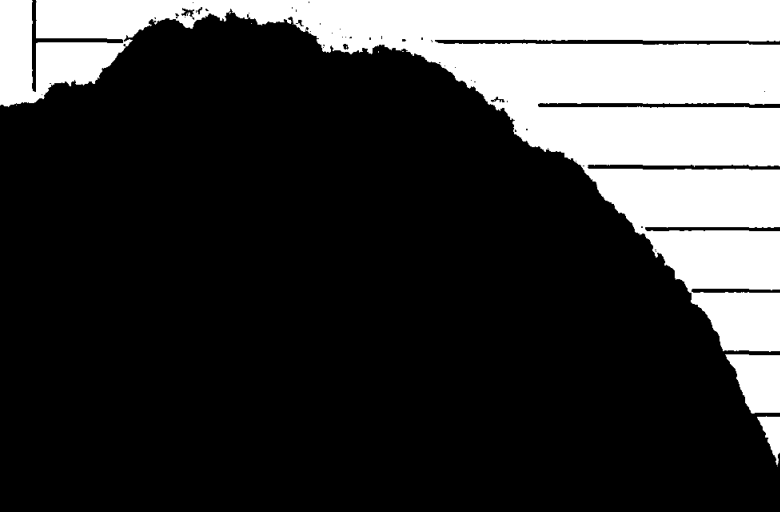
144

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

100

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
<u>100/24</u>	Charley Brown ADS -
100/25	Load & Clear -
	Go for POE -
	Gaults 65 hrs -
	7
	Mouthing about the boulders



FLIGHT DIR MISSION LOG	DAY	REV	PG 144
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<u>100/27</u>	Weis GO		
	Edan among them -		
	Soon as gets kerth -		
	on the		
	- .1 Dps -		
	- .3 NO melting -		
	- .5		
	61.2 x 9.2 LOC		
	28.6 PBS		
	<u>MCC</u> - All GO -		
	Enough koulders to plug		
	Calveston Bay -		
	<u>Fixed Roper f. 13</u>		
	Smooth when the the day -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (248)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
100/30	Negotiation of - all good -		
	Picture Radar Test -		
	TCP 1540 Vial -		
	Comment on boulders		
	Volcanism -		
	CR6 radar doing well -		
100/32	VHF range issues		
100/33	Maybe low CRK label		
	Bring from highlands RTM		
100/33	L RK label -		
100/34	No PPI Start -		
100/35	ATC Batts -		
	TECOM - BATTB looking out -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<i>100/37</i>	<i>- AT this in optics -</i>		
<i>100/38</i>	<i>Down there among them</i>		

FLIGHT DIR MISSION LOG	DAY	REV	PG 146
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Tail Hook twice there -		
100/37	Conspicuously tall, its fuel -		
	<u>recs</u>		
	CO ₂ 2.4 little higher than		
	normal		
	No sweat -		
	100/43/20 - PC -		
	Center talk - could not read		
	very well -		
	Signal strength on USA -		
	<u>MLL</u> - can you read off USA? -		
100/41	Apollo Ridge -		
	Apollo Hill -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<i>but clear - 610 -</i>		

FLIGHT DIR MISSION LOG	DAY	REV	PG (147)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	VBF - 1 couple ten thousand miles -		
	of Cor shell from H6A -		
	have annis -		
	to 10/10/10 talk -		
<u>100/48</u>	Down Vail Boeing -		
<u>100/49</u>	Go for Q -		
	Hasselblad just failed -		
	MCC - Brin for Q -		
	AI - bring to set side -		
<u>100/52</u>	AGS - OK -		
	Vg's correct -		

FLIGHT DIR MISSION LOG	DAY	REV	PG <i>140</i>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<i>Checklist sound good -</i>		
	<i>Orbital light</i>		
	<i>+ .2</i>		
	<i>- .5</i>		
	<i>- .9</i>		
	<i>sun all good -</i>		
	<i>UTY lite, Orbital, MCTW -</i>		
	<i>Data good -</i>		
	<i>One shard Thy -</i>		
	<i>rather Gene couldn't</i>		
	<i>keep up w H&A -</i>		
	<i><u>CPC</u> Took on many pictures</i>		
	<i>K&H camera failed -</i>		
	<i><u>FDD</u> - Kepler Residuals small</i>		
	<i>11.9 x 190</i>		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

101718

Good tracking in CSM

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
			149
		Reset wdg color Xpander -	
101/08		RVA lockin -	
	06/99	SRDU -	
		B-j -	
		Insertion pad -	
101/11		Reject it -	
		OK on SV -	
	101/40/50	LT Sumie -	
101/13		Pod read back -	
101/15	A/	Eops track -	
	MCE	6 hrs good to us	
	RM	12 x 190 Rangeplan fit	

FLIGHT DIR MISSION LOG	DAY	REV	PG
------------------------	-----	-----	----

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
--------------	--------------------------------

CMC Tracking looking good

101/24 Ammi P-

101/31 Charley Brown -
 P20 looks good -
 Good to me, too -

FLIGHT DIR MISSION LOG		DAY	REV	PG
SITE/ACQ/LOS		FLIGHT EVENTS/HISTORY/BRIEFING		
				180
		Pops CBM 16 - 3 times -		
101/17		Ammis - Ground Squelch in -		
101/20		P52		
101/20		Normal - Range off - 5000 -		
101/26		Energy 3x - LBR		
101/26		Fast Auto Optics - Accum Particle by 1000000 Antares - Marking -		
101/30		STAR 0000 2 diff L - 00 169 + 00 050 + 00 066		

SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING
--------------	--------------------------------

101 | 34

Radiat Temp 40 lower than
past runs -

CR apparently comfortable -

FLIGHT DIR MISSION LOG	DAY	REV	PG (157)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
10/1/32			
★	PCO2		
★	Pilot report of loggers		
	① Cameras -		
	Brief: ② KMPB du CM press -		
	③ Overpress cabin it		
	④ PCO2 - watch -		
	⑤ Relays - Comm Tests		
	⑥ Questions from armylar -		
	EMU		
	Retros - FIDO -		
	Change qty in Ins. B/V.		
	Vx 172 vice 170		
	GUD - SV TO CMC		
	LOC		
	later on to CM after bus		
	CSI pad -		
	Control - ODFORAPS -		
	TBZCOM -		
	GNC - EECOM - Relay Tests -		
	CAPCOM -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
102/22	Charley Brown		
	316.45 miles -		
	POO of Accept -		
	Everything is working -		
102/24	✓ DVX = 284172		
	320.5 miles -		
	Miles into range -		
	CHC yms - SV in -		
102/26	VHF ranging right a -		
	TIG 102/50/+31		
	wrong.		
102/29	TIG 102/50/01.00		

(152)

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

102/28

APS good -

ASC BATS good -

102/30

Order - LOC yms -

102/31

H - Both watts dead -

S - 2 film packs -

Jim wire steper to

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
102/41	CSM on HOB		
	AP for		
	2		
	100°		
	Auto mov will be too low -		

FLIGHT DIR MISSION LOG	DAY	REV	PG <u>153</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Ino @ 30 level - <u>BOTH</u>		
<u>102/37</u>	APS good to us -		
	Eminents to staging -		
<u>102/40</u>	Go for staging		
	82 90 ^{II} LTR WT.		
	Control - PAF - WT.		
	RCS +.50%		
<u>102/44</u>	P47		
	Staging -		
	Close to gimbals lock -		
	Something went wild at staging -		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

Charley Brown - RT Run off

102/58

Charley Brown, 50/sec forward
more -

103/02

Done w/ Lystra -

46.6

11.1

FLIGHT DIR MISSION LOG	DAY	REV	PG <u>154</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Went to ettdb, mustaft - Thing took off - 609 hold - avoided kah - OK for insertion - 5 min to burn - He was in AGS wide AS first trying -		
	Copy Residuals <u>46.7X11.0</u>		
	F100 Doppler good on two tracks		
<u>103/04</u>	103 Dennis for R 52		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
103/05	CSM reading CM now VHS		
103/18	Guid 876		
	Forgot to enter on N84		
	that's why first CM estimate		
	was wrong after 200 -		
	Final enter on N84 -		
	Cycle 2M press for 10 sec.		

FLIGHT DIR MISSION LOG	DAY	REV	PG 155
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Surphel T8A05 - Mode Control -		
	Guid Ctrl T8A05 - Mode Ctrl should have been in auto hold but it was in auto -		
	00004		
	000131		
	121		
	001		
	CSI update -		
	GOLD - TRK - TRK Time -		
	AT - all being good on auto - works -		

DR, AV

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	(156)		
	48.7		
	47 fps -		
	45.3		
	last align feet miss sets -		
103/25	N81486 - CIGAD -		
	0 45.3		
	0 000		
	106		
	+ 453		
	+000		
	+005 z		
	47	CSM	ACC
	47	44	45.
	one half of		
	Conversation - this side -		
	sounds like CSM is		
	seeing out of plane -		
	- f 6.4 fps		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

All Gokere -

16 Hore out of plane at CSI -

45.3 fps on board -

Brief -

CDH TRISOLN -

LM press for 10 seconds -

See Evap -

Relay CSM ?

Either Way on LM -

EMU - ROTKO - F100 CDH 3fps -

GUID - 281 for CSI ✓

Control - - 9% during strapping -

TECCOM - Have procedure for swing LM -

GHE - EECOM (CSM relay attached)

A/G 281 for CSI -

Ch. 60.

CAPCOM -

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
CSM			
104/20			
	Talking about STIKES to Snoopy		
	Tracking LM against moon -		
	fantastic -		
104/25	MCC		
	Did do a flare charge?		
	-1.1 fps -		
	+1 in opposite		
	did not do -		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

104/24

Snoopy

Minimal turn -

Everything went good -

Beautiful earthrise -

CSI

45.3

0

0

-0.4

0

0

104/25

HGA - labeled over horizon

820 - first mark -

have to reject -

5 digits -

FLIGHT DIR MISSION LOG	DAY	REV	PG (159)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	TPI 2+20 late -		
	sh 19.9		
	locked on all the way -		
	104/43/52 ✓		
	80° on nearby radar Ferry -		
	reboot as it has gotten a		
	Plane Change -		
	NOT EM solution -		
104/30	VAF - Range Agree - RePro -		
	CDA 2 Time -		
	- 4.2 f/s cm soln - THWORTH -		
	- 3° on RCS		
	Final CDA soln -		
	3 f/s mt of EM returns -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
104/40	<u>MCC</u>		
	CB- Manually set 100 for 120 -		

FLIGHT DIR MISSION LOG	DAY	REV	PG 160
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
104/37	Contd AOS updated celestial complete Below - Good on consumables - 104/43/5 - 2 CRA At Burn Good		
104/44	Approach is smoother than orbit photo 25-30% semi clear area - FID EST. 105/18/38 → 105/21/01 - Earth day - North pole bright - beautiful sight - 105/22 Auroral Solus - 21 Nominal -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
106/09	As for flight in at your convenience		
	Questions for crew to discuss		
1.	LM S-Band Conn following DOI?		
2.	What fixed VHF problem? Don't bring		
3.	CSM hatch + insulation problem		
4.	LM pressurization loss.		
5.	LM gear in the CSM		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	161		
105/04	105/23/06 new TLI fine		
	105/22/56		
	Deploying along		
	Go for normal LM ops -		
	no need to keep LM -		
	TLI -		
	0		
	.1		
	.4		
	105/25 A Thrusters		
	like a Fin tube w 2" coil		
	71%		
	58% B		
	Mavis -		

CSM -

FLIGHT DIR MISSION LOG

DAY

REV

PG

162

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

CSM - No problems except tunnel

106+109

CSM AOS

FLIGHT DIR MISSION LOG	DAY LM	REV	PG (162)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	LM Weight 7544 - *		
	DAP load may change *		
	May need to zero ADD 404 DEDA		
	✓ change ^{GO} to Secondary Connistor		
	Just After ^{After} to steerable : @ 107		
	FAO - bring back both Camera -		
	were only bringing Hassellblad		
	✓ ASC feed for TPI - May not have		
	shut mains *		
	Need final position of dials on		
	HGA		
	* Ask Crew about First Rev Comm -		
	? ① Did we have PRN ON		
	② Possible sidelobe		
106+19	LM AOS GDS		
	Almost ready to dock		
186+19	CSM AOS -		

FLIGHT DIR MISSION LOG	DAY CSM	REV	PG 163
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
106+21	CSM Systems Good		
106+22	Hand docking		
	Have loads		
	APS ATTITUDE PASSED UP		
	NO CSM		

FLIGHT DIR MISSION LOG	DAY LM	REV	PG (163)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
106+20	RCS-A 62% B-49%		
	LM Systems Good		
106+21	- LM Capture		
	RDZ great -		
106+25	Secondary on CO ₂ Cannister -		
	Pressurize from CSM		
106+28	DAP-10011 →		
106+28	Pump - rejected earlier		
106+30	POD + DATA		
106+30	LM State Vector going up -		
	- Tood completed		
	Drive HGA to Stops - Should go to		
	omni's AFT		
106+38	Bring Primary 410H Cannister back		
	when to Store *		
	Hatch bag under left seat		
	Sleeping bag -		

FLIGHT DIR MISSION LOG	DAY CSM	REV	PG (164)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
106+59	CSM Down Voice B/u -		
	LBR		
	Water Dump - @ 119 hrs ★		
107+02	C/B in tight D/B -		
107+04	Now on HGA		
	B-3 + G-4 are off		
	C/B -		
	AFF		
107+09	B- DAP OK		
	up on HGA		
107+11	61102 - DAP		

FLIGHT DIR MISSION LOG	DAY LM	REV	PG <u>169</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
106+47	- Need <u>forward</u> on omni -		
	APS PAD up -		
106+53	Zero DEDA - up -		
	Pri Canisters - back		
	LM in burn Attitude - GBR		
	Est down voice		
	P/B		
	have Configured for S-Band		
107+04	except voice		
	same voice		
	<u>182°</u> <u>-005°</u>		
	P-30 Completed		
107+08	lost Data		
	AD		
107+08	267 - 4600		
	HGA - Set for 0° yaw		
107+10	Numbers same - 182 -10°		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
107+15	DAP Now Set up -		
	Now in Attitude		
	107+22		
	CSM seems to be holding 7		
	107+30		
	Package A Constant -		
	Now going Down		

FLIGHT DIR MISSION LOG	DAY	REV	PG
	LM		(165)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
107+13	No Ascent Feed Required 616 to zero 616 to zero - 411 to +1		
107+14	- DEDA Set up - No Asc Feed		
107+16	Pressure rgs to egress ✓		
107+18	HGA	182	-005
	616 needs to be set to zero - zero ullage confirmed		
107+22	PGNS Mode Control to Auto ✓ ✓B per checklist HGA drifting off - Glycol pump switch over now on #2		
107+29	P-42 - not yet ^{stay} go P00		

FLIGHT DIR MISSION LOG	DAY CSM	REV	PG 166
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
108+17	- DATA - ATTITUDES - GOOD		
	Quad A TEMP OK		
	IN S/C - Tunnel is not vented		
	4 psi over pressure in		
	Wants		
	R-180°	108+21	
	P-252°		
	Y-360°		
108+22	Go for Pyro ARM -		
	Hz Heaters in Sleep Configuration		
	#1 - Auto, #2 - OFF		
108+24	P-47 -		
108+24+35	- Separation -		
	Pyro Safe		
108+28	LM really left		
	Down Same attitude		
	+X vice -X		

FLIGHT DIR MISSION LOG	DAY LM	REV	PG 166
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
108+17	LM DATA GOOD		
108+17	GO FOR <u>JETTISON</u>		
108+24	- lost Data 10 Sec Now Back		
108+25	lost Cabin Pressure @ Sep -		

FLIGHT DIR MISSION LOG 167	DAY CSM	REV	PG
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		
108+31	Need to enable B-3 + C-4		
	Like Snow Storm		
108+36	Cannister O/B - Roll angle +.1		
108+38	B-3, C-4 - enable		
108+41	Need to enable all quads in DAP R ₂ all 1's		
108+42	DAP Square		
108+43+30	2.1 +X +.1 y -.1 z		
	Told Crew about Batts - they will Call Us -		
	<u>390°</u> - A-10 Quad A → He took temp		
	124° - now on package temps		
	A-10 Can ^{see} Snorpy		

FLIGHT DIR MISSION LOG	DAY TJM	REV	PG 167
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
108+40	Possible SOV RCS System A		
2	Closed - No ullage maybe		
2	Fuel %s low - Chud to SOV shut off		
	✓ leave like is + of have no ullage		
108+52	- APS burning -		
108+52			
108+53	- APS Doing well		
108+54	Did get ullage from System A		
	Went out -		
108+55+39	- Shut off - Good DATA A-15% B-29%		
108+ 55 57	- Momentary loss of Data - back in		
108+59	# - Set up in P-00 - in test 1		

FLIGHT DIR MISSION LOG 168	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	EECom - ^{PSE} Dump Complete -		
	125° New quad A fracture Mech limit - think 390° is wrong scale really 98°		
109+12	Loss State Vector load in -		
109+15	Cabin tight - still high due to cabin check		
	Make R ₂ - 11100 to get DAP configured		
	Attitude Hold looked good @ LOS		
110+16	AOS - Dumped Water - Hz fans OK PRIM loops OK		
C	GET 110+15 - BATT C 37.0 Pyro A - 37.0 Pyro B - 37.0 A - 60% B 78% C 72% D - 67%		

FLIGHT DIR MISSION LOG	DAY LM	REV	PG 168
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	TCP-		
109+06	121:30 - TELCOM - Ball depletion		
	ESTIMATES LOSE DATA		
109+52	GOING TO TEST #2 - MIN D/B		
	LM ΔV based on PIPPA'S = 9.7 fps		
110+09	Back in Wide Deadband - latching		
	rates build up		
110+16	- Going to test #3 - Punces - Wide DB		

FLIGHT DIR MISSION LOG	DAY CSM	REV	PG 168 169
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
110+16	Cannister has been changed -		
	Need CSM optics zero -		
	CDR-26039		
	CMP - 05308		
	LMP - 15040		
110+22	Status - tired, happy etc No Pills - yet.		
	Crew will need extra sleep New wake up time 121 hours approx - depends on Systems situation and length of update required to get Set up for Rev 24 activities		
	Camera - pre flight problems		
110+45	John + Tom very talkative		
	Ascent engine has some wiggle at start up		
110+55	h _a - 63.4 h _p - 54.8		

~~CM~~ CM

169

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

110+32

Dump Valve in Auto before getting out
Verified twice -

Now in test #3 - step 6 - Max D/b
going to Min D/b

~~112+15~~

~~- AOS - Systems Good
- Pi loop max temp ?~~

~~112+27~~

~~CM - back to PCNCS~~

FLIGHT DIRECTOR'S MISSION LOG

DAY

REV

PG

~~170~~
SITE/ACQ/LOS

~~CSH~~

FLIGHT EVENTS/HISTORY/BRIEFING

Flight Director

Apollo Ten Weather Status

prepared 0430Z 23 May 1969

Forecast conditions:

aborts thru lunar orbit 21 -

MPL - partly ;cloudy, east 15 knots, 5 feet & 77 degs.

AOL - partly cloudy, east 15 knots, 5 feet & 72 degs, widely
scattered showers.

EOM -

MPL - partly cloudy, east 15 knots, 5 feet, 81 degs and widely
scattered showers.

AOL - partly cloudy, east 15 knots, 4 feet & 78 degs.

carter

FLIGHT PLAN UPDATE	
TIME	ITEM
107+00	ON A NON-INTERFERENCE BASIS AFTER MANEUVERING TO APS TO DEPLETION BURN ATTITUDE - PERFORM MSFN RELAY AND CSM RELAY COMM CHECKS
	ADD TO LM TO CSM XFER LIST: BOTH CAMERAS
108+40	NEW SLEEP ATTITUDE TO COOL QUAD A XXXXXXXXXX R 090 P 210 Y 000 HGA P -05 Y 231
✓ 118+15	CHANGE "INITIATE BATT B SECOND CHARGE" TO "INITIATE BATT A CHARGE" Do WASTE WATER Dump - to 25%

PRN
To Stops

ASK ABOUT DOI PASS - HGA
QUAD SET UP FOR SLEEP - DOCKING ANGLE
-CANNISTER

CSM CONSUMABLES STATUS

GET 107

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>161</u>	<u>220</u>	<u>189</u>	<u>196</u>
FLT PLN MARGIN	<u>21</u>	<u>64</u>	<u>39</u>	<u>43</u>
PHASE REDLINE (7E5)	<u>38</u>	<u>52</u>	<u>46</u>	<u>54</u>
RNDZ REDLINE	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
ΔV CAPABILITY	DAP <u>114</u>	SCS <u>7.3</u>		

SPS

TOTAL Wpu 13801 LBS / 34.4 %
 ΔV CAPABILITY DOCKED N/A fps UNDOCKED 4765 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 4250 fps
 BURN TIME REMAINING 200 SEC

BATTERY STATUS

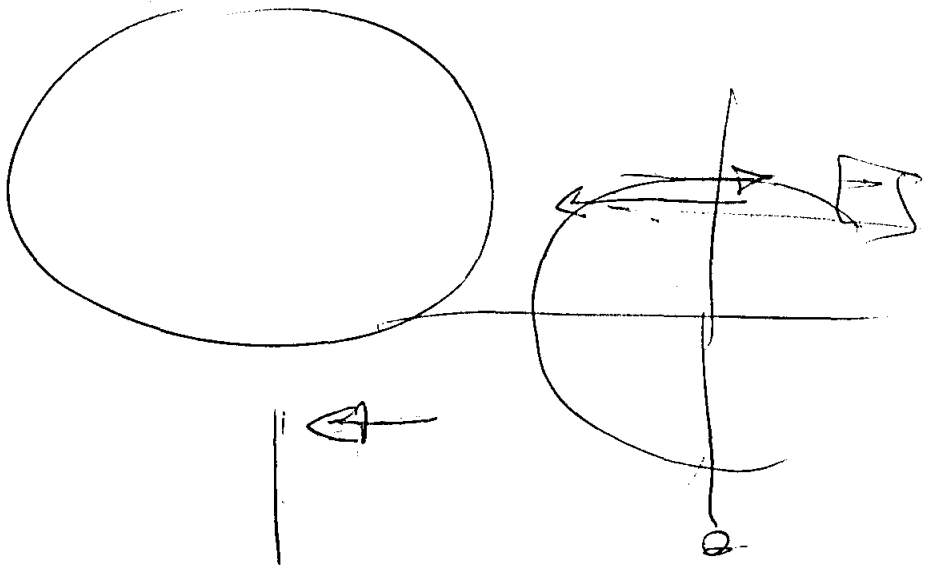
A 33.2 Ah B 32.3 Ah C 38.3 Ah
 TOT 103.8

CRYOS

H₂ 326 LBS () SINGLE TANK LIFETIME 218+30 GET @ 50amps
 PRESENT AVERAGE USE RATE .127 LBS/HR
 O₂ 415.4 LBS () SINGLE TANK LIFETIME 237+36 GET
 PRESENT AVERAGE USE RATE 1.9 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 64.4 %
 WASTE AT 85% AT 110+02 GET
 NEXT DUMP AT 108+ GET



E

APOLLO 10 MISSION

Fifth Report

(72 through 96 hours)

The mission has progressed satisfactorily. The major activities during this period were lunar orbit insertion and circularization, activation of lunar module systems, color television transmissions, and preparations for lunar module undocking.

The service propulsion system was fired twice to place the spacecraft into the desired lunar orbit. The first firing, lunar orbit insertion, was performed at 75:55:53; it had a duration of 356 seconds and produced a velocity change of 2981 ft/sec. All systems operated well during the firing. The resulting orbital altitudes were 170.1 by 60.6 nautical miles. At 80:25:07, the lunar orbit was circularized to 61.2 by 60.0 nautical miles with a 14-second service propulsion firing. The velocity change was 139 ft/sec. Residuals following both maneuvers were small. At 96 hours, the apocynthion was 62.1 nautical miles, pericynthion was 58.0 nautical miles, inclination was 178.84 degrees, and period was 118.7 minutes.

The primary evaporator in the command module dried out during the launch phase; it was reserviced and activated automatically at about 73 hours. About 5 hours later, the evaporator again dried out and was deactivated. The primary radiators are continuing to provide adequate heat rejection.

Three color television transmissions were made during this period. The first two were made between 72 and 73 hours with durations of 7 and 18 minutes. The first transmission was recorded at Madrid, while the second was relayed live through Goldstone. The picture quality was good while the station was receiving on the 85-foot antenna and excellent while on the 210-foot antenna. The third transmission began at 80 hours 45 minutes and was 29 minutes in duration. Picture quality was excellent, with many valuable pictures of the lunar surface.

The crew placed the high-gain antenna in the automatic reacquisition mode prior to the sleep period. The antenna operated continuously in this mode, providing high-bit-rate data during each front side pass and low-bit-rate dump data from the back side pass. Antenna operation was excellent.

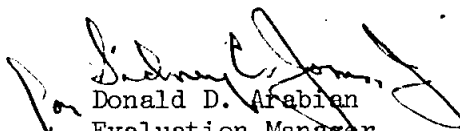
Debris trapped in the suit-loop vent valve of the command module caused a high oxygen flow and consequent master alarm at about 84 hours. The debris was removed, and flow returned to normal.

During initial activation operations in the lunar module, the alignment of the primary guidance, navigation, and control system was noted to be biased by 3.5 degrees in yaw. Preliminary indications are that the

misalignment was caused by a structural offset between the two spacecraft; however, this will not create any constraint to mission operations.

A combination of the various lunar module omnidirectional and steerable antenna modes used for communications with the Network were checked during the fourth lunar revolution. All direct modes operated as anticipated; however, time limitations prevented an evaluation of the lunar module relay modes through the command and service modules to the Network. An attempt will be made to test these relay modes after the rendezvous is completed.

All temperatures have been within normal limits. Consumables usage has remained near the predicted levels, and crew performance continues to be excellent.


Donald D. Arabian
Evaluation Manager

APOLLO 10 MISSION PROBLEM LIST

May 22, 1969

D.C. [Signature]

ITEM NO.	VEHICLE		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
1	X		(PRELAUNCH) Command module reaction control system A Helium manifold pressure decay	Leak rate remaining constant. Tests indicate no degradation due to shock from 50 to 300 psig for leak in tubing.	Ferguson		
2	X		(PRELAUNCH) Fuel cell 1 oxygen flowmeter failed	Caution and warning was affected when switching selector from fuel cell 2 to fuel cell 1. There is no constant caution and warning.	Ferguson Kingsley		
3	X		(PRELAUNCH) Command module reaction control system B helium manifold pressure abrupt drop from 44 to 37 psi when propellant isolation valves opened.	Burst disc on oxidizer system ruptured.	Ferguson	CLOSED	
4	X		(PRELAUNCH) Suit loop water separator breakthrough	Change in wick wetting technique was successful	Hurt	CLOSED	
5	X		(GET 00:07:00) Primary environmental control system evaporator dried out.	Switch to secondary evaporator at 00:15:00. Primary evaporator re-serviced at 73:15:00.	Hurt		
6	X		(GET 01:47:00) Thin white line on right hand side window (top to bottom).	Await postflight debriefing	Wade		
7	X		(Approximate GET 02:38:00) Crew reported high frequency vibration prior to completion of S-IVB translunar injection firing.	Data from spacecraft shows about 16 Hz, 0.1g peak-to-peak. Rates show 0.4 Hz, 0.1 deg/sec. No significant vibration.	Wade	CLOSED	

APOLLO 10 MISSION PROBLEM LIST

ITEM NO.	VEHICLE		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
8	X		(Approximate GET 02:36:00) High oxygen flow caution and warning during translunar injection firing Cabin oxygen regulators operated at same time.	Caused by combined flow of cabin purge and make-up oxygen by the cabin pressure regulator	Hurt	CLOSED	
9	X		(GET 10:20:00) Carbon dioxide partial pressure readings 1.2 mm Hg; should be lower.	Readings are not consistent with anticipated values when cartridge changed.	Gillen		
10	X		(GET 24:06:00) Program alarm 122 occurred while or immediately after the crew was observing the earth through optics	System analysis to determine possible causes	Hanaway		
11	X		(GET 23:47:00) (48:20:00) Environmental control system oxygen manifold pressure dropped to 75 psi (should be 100) for about 3 seconds during redundancy checks.	One regulator supplying the demand of two emergency repressurization regulators wide open will drop manifold pressure to 72 psi as measured in tests. There is also considerable scatter of the manifold pressure, as indicated from all available data. No abnormal condition is indicated.	Hurt		Test Change Notice to be prepared to test system same in ground tests as in flight for 107 and subs.
12	X		(GET 32:00:00) Water/gas separator does not operate satisfactorily.	Tests in progress at MSC to determine best procedure.	McAllister		
13	X		(GET 26:28:00) Digital event timer on panel 1 jumped 2 minutes during countdown prior to first midcourse correction (second planned correction).	First time minutes jumped. Circuit study and test in progress.	Lattier		

APOLLO 10 MISSION PROBLEM LIST

ITEM NO.	VEHICLE		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
21	X	X	(GET 94:28:00) Simplex-A not operating	Isolation test submitted; VHF ranging may be affected.			
22		X	(GET 97:34:00) Thrust chamber pressure switch telemetry indication for B-3 jet inoperative. (GET 98:31:00) Thrust chamber pressure switch for B-4U jet inoperative				
23	X		(GET 98:33:00) No down-voice from command and service module.	Ground problem, Goldstone was receiving down-voice problem. Corrected at 98:39:00.		CLOSED	

APOLLO 10 MISSION PROBLEM LIST

ITEM NO.	VEHICLE		DESCRIPTION	ACTION IN PROCESS	ACTIVITY ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
14	X		(GET 03:27:00) H-film coating on forward hatch flaked off during lunar module cabin pressurization.	Fix H-film on hatch for 107 and 108. Film is no longer a thermal requirement. Removed from 109 and subsequent per CCB.			
15		X	(GET 85:10:00) Crew reported that the lunar module potable water contained air.	Procedure for evacuating flex hose not followed during servicing. Awaiting further commands to see if condition persists.	Gillen		
16		X	(GET 83:20:00) S-band noise when antenna moves; glycol pump noise is as bad.				
17		X	(GET 82:20:00) Abort guidance system deadband switch indicated max. on telemetry when in min. position.	This is normal for circuit breaker open. Working correctly after system powered up.		CLOSED	
18		X	(GET 82:45:00) Glycol temperature read zero during first manning; presently reading correctly.				
19		X	(GET 82:20:00) Ascent propulsion system manifold oxidizer pressure 187 on telemetry, 180 in cabin; predicted preflight was 170 psi.	Analysis indicates that transducer has shifted, based on LM-3 experience and present reading of temperature on oxidizer side and readings of pressure and temperature on fuel side.			
20		X	(GET 96:28:00) Tunnel would not vent	Lunar module depressurized		CLOSED	

FLIGHT DIR MISSION LOG	DAY	REV	PG 173
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<u>G+C</u>		
	1. CM RCS Ring status is the		
	same, except Ring 1 leak rate is		
	a little lower.		
	2. Qd A He tank temp has		
	decreased to well below fracture		
	mechanics limits		
	3. SPS use of PU valve for		
	TEI - should start in normal +		
	then go to increase after 2 ND Bank		
	of Ball valves are actuated. This		
	is slightly different from what crew		
	was advised		
	4. PIPA'S + Gyro's are good		
	5. Qd C+D OFF		
	6. A/C Roll has been selected		
	7. Attitude jets are firing about		
	every hour		
	- o -		
116:05	Telecom predicting LM		
	EPS lifetime of 119 hours GET		
116:16	Commanding LM attitude change		
	to maxing S.A. Coverage		
	6° in Pitch, 1° in Roll per		

FLIGHT DIR MISSION LOG	DAY	REV	PG 174
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
116:18	CMP plugged in his Biosensor		
	LMP heart rate is around 80 to 90		
	Crew is apparently awake - They		
	have now unplugged		
116:28	Guid. O, getting LM EMOD		
116:32	Change in Bat A		
	Purging FC's		
1	Recommend B/D Roll today		
116:41	AIO Voice Breaking Up badly		
	Crew Status Report		
	5 to 6 hrs of sleep		
	AIO leaves on 70mm Handblad		
	is jammed - "Should we try to take		
	it off!"		
117:24	LOS		
	G+C Post-Par		
(*)	1. G+C wants PU valve utilization		
	to be as follows		
	Start burn in Normal (Oxidizer flow values)		
	Go to Increase after 2nd Burn		
	activated.		

CSM CONSUMABLES STATUS

GET 115400

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>159</u>	<u>215</u>	<u>188</u>	<u>190</u>
FLT PLN MARGIN	<u>27</u>	<u>66</u>	<u>45</u>	<u>44</u> (182)
PHASE REDLINE (TEI)	<u>121</u>	<u>163</u>	<u>142</u>	<u>135</u> (561)
RNDZ REDLINE				
ΔV CAPABILITY	DAP <u>127</u>	SCS <u>79</u>		

SPS

TOTAL Wpu 13800 LBS/ 35 %
 ΔV CAPABILITY DOCKED _____ fps UNDOCKED 4754 fps ✓
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 4250 fps
 BURN TIME REMAINING 200 SEC

BATTERY STATUS

A 33 Ah B 31.6 Ah C 38.3 Ah

CRYOS

H₂ 30.6 LBS (-0.1) SINGLE TANK LIFETIME 220 GET @ 50 amp
 PRESENT AVERAGE USE RATE 0.191 LBS/HR
 O₂ 395 LBS (+20) SINGLE TANK LIFETIME 239 GET @ 50 amp
 PRESENT AVERAGE USE RATE 1.93 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 29.2 %
 WASTE AT 85% AT 135+15 GET
 NEXT DUMP AT TBD GET

FLIGHT DIR MISSION LOG	DAY	REV	PG 175
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
*	2. Transfer list of Non standard items transferred to the CSM - we need to get this from A10 today		
	3. Auto RCS select ^{ors} off for Ods C&D.		
	4. Crew is in 5° DB and they think they are in 10° DB - 5 -		
	SPAN working on Storage list		
	66.3 x 55.5 = CSM ORBIT $\lambda_p = 89^\circ E$		
118:07	Want to go to Auto operation on H ₂ tank Heater		
118:10	AOS		
118:19	Oblique photoz of LLS 2 with Black & White, F4 F stop changed to F8 at 118:28 and F2.8 at 118:35		
118:42	Description of Thermal pro Pre-Equalization Value given Allow insulation up and under		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

insulation from around the pressure
equalization valve - center of
hatch

helmet bag full of insulation
left in LM

Beads of water around forward
hatch on O-ring center pin
out against seal.

118:50

FIT Plan Update

Consumables Update

Advised A10 that

Insulation will be taken off of
S/C 107 + Subs A 10 should
not worry about losing this insulation

Crew says the insulation is causing
a lot of itching

118:54

State Vector 166 } Complete
Clock Update }>

119:04

Now have single tank
capability on H₂

FLIGHT DIR MISSION LOG	DAY	REV	PG
			177
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	122:05 Goldstone ACQ		
	Need terrain, Ks from P52		
	Crew didn't copy will get a		
	playback		
119:24	AIO said VHF "just started		
	working" They didn't change		
	any switch positions -		
*	Plan for TV on Rev 29		
	NC setting it up		
120:01	Lost LM data		
120:07	Finally Data get from S/C		
	Performing Strip Photo from		
	terminator to terminator		
	S/C was called the wrong		
	way - Got Sun in the window		
	at terminator		
121:00	State vector Uplinked and Pads		
	read up.		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
--------------	--------------------------------

121:04

FC1

X

FC1 Pumps A/c CB Pul 226 IN?
 Switch FC Pumps 11 To A/c 1 ? Pul 15

Glitch ON AC Bus 1 down to 112V
 may have popped a CB

CB will not Reset F

A/C Bus 1 MNA + MNB

Warning lights come on when
 CB was pulled in

SKIN Temp ↑ 425°

TCE ↓ 149°

FC Warning light

121:14

{ Open Circuit FC 1 } Action
 { FC 2 MNA } prescribed
 { FC 3 MNB } by EECOM

Cryo O₂ Heater cycle may
 cause a low bus voltage

FLIGHT DIR MISSION LOG	DAY	REV	PG 179
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Expect to be able to use FC1 for burns & peak loads Can purge to keep temps within limits.		
	120:46:50 - AC glitch to 112V		
	1. In line off FC1		
	Will put FC1 ON line intermittently & purge as required.		
	25 hrs worth of H ₂ purging available		
122:04	AOS		
	LDMK TRK ON site F-1 in progress		
*	A10 managing Cryo Heaters manually to avoid unexpected reduction in MN Bus Voltage.		
122:33	Finished LDMK 130 tracking we got the data		
122:39	Uplinking state vector on OMNI's in LBR		
122:47	all Pads & data uplinked		

SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING
--------------	--------------------------------

	Y=192 180
	P=-70 -80
	S-28
	less the call out
	Bat C Main A
	FC Pumps Off
123:04	Started DSE Domp

FLIGHT DIR MISSION LOG	DAY	REV	PG 181
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<u>FCI Plan</u>		
	1. Leave FC off line		
	2. In line heaters OFF		
	3. Monitor SK in Temp		
	390 ← SKWT ← 410 ← Maintain with in these limits with the inline heaters,		
	Should keep H ₂ O prod. to minimum		
	Can purge with H ₂ to help clear out H ₂ O		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

— BLACK TEAM ON —

RETRO - Nominal block pool

FIDO - 67.1 X 54.7

~~RETR~~ TEI TIG

137+36+103.8

GUID - Landmark tracking

GUC - No problem

Surgeons - LIOH canister change?

FAO - CPI real good

130 real good

CAPCOM - TEI₂ PAD

Stowage

Rev 25 Map update

EECOM - Nothing new on IFC #1

18581

- BRACK / COM ON -

FLIGHT PLAN UPDATE	
TIME	ITEM
	STORAGE AREA AMERAS
	AND PARACHUTE CANISTER =
	WRAP CANISTER IN GIG
	AND STORE IN A8.
	LHM CANISTER CAN UP
	RE EITHER OF HOH - MOUNTAIN
	(1) PUT INSIDE A HELMET
	+ STORED IN L3
	OR (2) STORED INSIDE ONE
	PGA
	DID THEY PUT ANYTHING
	INTO LM BEFORE JETTISON
	# 1
	EECOM - MDCOM

MISSION NOTES

10 F.D.

5-23-69

We have been discussing the insulation problem with our toxicologist and it is a very small fiberglass fibre which is coated with silicone & is principally an irritant. Most of it if inhaled will be coughed up and then swallowed.

The skin itching & thus scratching could be relieved by gently wiping skin areas with a moist wipe. This should be done especially in areas where skin rubs such as under the arms and in front of the elbow. Hard wiping will drive the tiny fibres into the skin.

Chuck Berry

Do this
only if the
other camera fails.

70 mm Camera Malfunction

Based on crew report of symptoms, the failure has been attributed to either a mechanical linkage hang up, a microswitch failure or a motor failure, which prevents motor operation for film advance.

These mechanisms are in the camera body and not readily repaired in flight.

Of the above possible failures, the most likely is the mechanical linkage hang up.

A possible fix may be to remove three small screws on lower right side of camera cover; remove the cover plate with the two screw holes; locate steel arm which is visible in exposed slot about $\frac{3}{4}$ inch from front cover; After taking an exposure push the steel arm forward; camera should cycle.

CAUTION: Cover over right side of motor housing is no longer retained. Do not touch exposed gears.

If above procedure does not correct problem, no other in flight fix can be attempted.

CSM CONSUMABLES STATUS

GET 123

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>146</u>	<u>212</u>	<u>187</u>	<u>190</u>
FLT PLN MARGIN	<u>20</u>	<u>70</u>	<u>50</u>	<u>52</u>
PHASE REDLINE (TED)	<u>38</u>	<u>52</u>	<u>46</u>	<u>54</u>
RNDZ REDLINE				
ΔV CAPABILITY	DAP <u>130</u>	SCS <u>78</u>		

SPS

TOTAL Wpu 13800 LBS/ 35 %
 ΔV CAPABILITY DOCKED — fps UNDOCKED 4754 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 4250 fps BT 240
 BURN TIME REMAINING 200 SEC

BATTERY STATUS

A 36.7 Ah B 31 Ah C 38.3 Ah
~~TOT~~ 100

CRYOS

H₂ 29.4 LBS () SINGLE TANK LIFETIME 223 GET @ 50
 PRESENT AVERAGE USE RATE .19 LBS/HR
 O₂ 388 LBS () SINGLE TANK LIFETIME 246 GET @ 50
 PRESENT AVERAGE USE RATE 1.88 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 37 %
 WASTE AT 85% AT 13947 GET
 NEXT DUMP AT TBD GET

P30 LM MANEUVER						
APSD EP				PURPOSE		
+	0	0	108	HR	N33	
+	0	0	050	MIN	TIG	
+	0	31	00	SEC		
+	4	5	57.6	ΔVX	N81	
+	0	0	00	ΔVY	LOCAL	
-	0	6	23.1	ΔVZ	VERT	
+	4	6	00	ΔVR		
X	X	X	407	BT		
X	X	X	000	R	FDAI	
X	X	X	251	P	INER	
+	4	5	98.1	ΔVX	AGS	N86
-	0	0	00	ΔVY	AGS	
+	0	1	33.9	ΔVZ	AGS	
X	X	X		COAS		
X	X			AZ		
X	X			EL		

REMARKS:

CSM GIMB ANG

R 300 (Assume Docking Angle
of zero)

P 071

Y 000

COO" F
RR AHSK GCTR GGDS HNET HOPS LMAD
DE HMSC 009
14/2303Z
FM NC
AHSK/M&O
DS/M&O
LMAD/M&O
GCTR/NOM
DLD/TIC, TRACK, RTC, COMM TECH, COMM CONT

SECTION ONE OF TWO PAGE ONE OF THREE

APOLLO 10

CSM/LM TELECOMMUNICATIONS TESTS

1. SEVEN LM/CSM TELECOMMUNICATIONS TESTS ARE PLANNED TO BE PERFORMED DURING LUNAR REVOLUTION 4. TESTS WILL BEGIN AFTER LM COMM ACTIVATION IS COMPLETED.

2. GENERAL COMMENTS

- A. HOUSTON CAPCOM WILL CONDUCT ALL TESTS AND WILL CONFIGURE BOTH THE SPACECRAFT AND THE MSFN SITE ON GOSS CONFERENCE (NET 1)
- B. MSFN SITE WILL REPLY TO CAPCOM ON GOSS CONT (NET 1)
- C. EACH TEST IS EXPECTED TO LAST APPROXIMATELY 2 MINUTES
- D. GDS IS INTENDED TO BE THE PRIMARY MSFN SITE FOR THE TEST. GDS-X IS INTENDED TO BE BACKUP TO GDS.
-GDS
- E. THE ACTIVE SITE SHOULD CONFIGURE DECOMS FOR THESE TESTS AS FOLLOWS:

ONE DECOM - LM HBR
SECOND DECOM - LM LBR
THIRD DECOM - CSM

- F. THE CSM CONFIGURATION WILL REMAIN IN MODE 6.02.00 THROUGHOUT

Except for
Dump -

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THE TEST PERIOD.

G. MSFN SITE MUST CONTINUE NORMAL MCC REPORTS (ON NET 2) PER NOD.

H. ALL REFERENCES TO STEP AND ACTIVATION NUMBERS IS DIRECTED AT CREW CHECKLIST.

3. DETAILED PROCEDURES

TEST 1 (S-BAND/VHF ~~B~~ VOICE TEST) *expect to be O.K.*

SEQUENCE	POSITION	LOOP	ACTION
SEQ 1	MSFN SITE	NET 2	ACQUIRE LM OMMI ANTENNA MODE 6.04.00 AND ANNOUNCE TWO WAY LOCK
SEQ 2	TELCOM	FD	NOTIFY CAPCOM TO PERFORM VOICE CHECK WITH LM
SEQ 3	CAPCOM	A/G	PERFORM VOICE CHECK WITH LM
SEQ 4	TELCOM	FD	ANNOUNCE GO/NO GO AND NOTIFY CAPCOM TO PROCEED.
SEQ 5	CAPCOM	A/G	INSTRUCT CREW TO CONFIGURE FOR OMMI VOICE/TM TEST STEP 1 ACTIVATION 14.

Count in All 3 mode 3 PTT, Vox, PTT/Vox

TEST 2 - OMMI VOICE/TM TEST

SEQUENCE	POSITION	LOOP	ACTION
SEQ 1	CAPCOM	NET 1	INSTRUCT MSFN SITE TO CONFIGURE FOR LM MODE 6.07.00 LBR.
SEQ 2	MSFN SITE	NET 1	VERIFY LM MODE 6.07.00 LBR NOTE: IT IS EXPECTED THAT VOICE AND LBR TM WILL BE MARGINAL IN THIS MODE. PLSS (EMU) DATA WILL NOT BE PRESENT.
SEQ 3	TELCOM	FD	MONITOR LBR TM AND NOTIFY CAPCOM TO PERFORM VOICE CHECK
SEQ 4	CAPCOM	A/G	PERFORM VOICE CHECK WITH LM
SEQ 5	TELCOM	FD	ANNOUNCE STEP 2 GO/NO GO AND NOTIFY CAPCOM TO PROCEED WITH STEP 3.
SEQ 6	CAPCOM	A/G	INSTRUCT CREW TO CONFIGURE FOR STEP 3 ACTIVATIONS 14. NOTE: 1.25MHZ SUBCARRIER IS TURNED OFF.
SEQ 7	CAPCOM	NET 1	INSTRUCT MSFN SITE TO CONFIGURE FOR LM MODE 6.02.00
SEQ 8	MSFN SITE	NET 1	VERIFY LM MODE 6.02.00 NOTE: (1) 1.25 MHZ SUBCARRIER IS OFF. EXPECT NO VOICE DOWNLINK.

(2) DECOM LOCK ON HBR TM MAY NOT BE ATTAINED.

SEQ 9	CAPCOM	A/G	CALL LM IN THE BLIND TO VERIFY CONFIGURATION
EQ 10	TELCOM	FD	AFTER APPROX. 2 MINUTES ANNOUNCE GO/NO GO AND NOTIFY CAPCOM TO PROCEED WITH STEP 5. ACT-14
SEQ 11	CAPCOM	A/G	INSTRUCT CREW TO GO TO STEP 5. ACT-14
SEQ 12	CAPCOM	A/G	PERFORM VOICE CHECK WITH LM NOTE: (1) IF VOICE CHECK IS GO, PROCEED TO SEQUENCE 13 +14 (2) IF VOICE CHECK IS NO GO, PROCEED WITH SEQUENCE 12A
SEQ 12A	CAPCOM	A/G	INSTRUCT CREW TO CONFIGURE FOR DN VOICE BACKUP
SEQ 12B	CAPCOM	NET 1	INSTRUCT MSFN SITE TO CONFIGURE LM MODE 6.04.00 HBR
SEQ 12C	MSFN SITE	NET 1	VERIFY LM MODE 6.04.00 HBR
SEQ 12D	CAPCOM	A/G	(1) <u>VERIFY CSM COMPLETED WITH LAND-MARK TRACKING AND IN SLEEP ATTITUDE.</u> (2) INSTRUCT LM TO PROCEED WITH <u>STEERABLE VOICE/TM TEST</u> AND PLACE THE VOICE SW TO VOICE.
SEQ 12E	CAPCOM	NET 1	INSTRUCT MSFN SITE TO CONFIGURE LM MODE 6.02.00.
SEQ 12F	MSFN SITE	NET 1	VERIFY LM MODE 6.02.00
SEQ 12G	ALL		PROCEED TO TEST 3 SEQUENCE 1 - Behru
SEQ 13	TELCOM	FD	ANNOUNCE GO/NO GO OF STEP 6 AND NOTIFY CAPCOM TO PROCEED WITH STEERABLE VOICE/TM TEST.
SEQ 14	CAPCOM	A/G	(1) VERIFY CSM COMPLETED WITH LAND-MARK TRACKING AND IN SLEEP ATTITUDE. (2) INSTRUCT LM CREW TO PROCEED WITH <u>STEERABLE VOICE/TM TEST.</u>

TEST 3 - STEERABLE VOICE/TM TEST

SEQUENCE	POSITION	LOOP	ACTION
SEQ 1	MSFN SITE	NET 2	ACQUIRE LM STEERABLE ANTENNA AND AN ANNOUNCE TWO WAY LOCK.
SEQ 2	TELCOM	FD	NOTIFY CAPCOM OF STEERABLE ACQUISITION AND TO PROCEED WITH VOICE CHECKS

PR AHSK GCTR GGDS HNET HOPS LMAD

DE HMSC 010

14/2303Z

NC

AHSK/M&O

GGDS/M&O

LMAD/M&O

GCTR/NOM

DLDTIC, TRACK, RTC, COMM TECH, COMM CONT

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SEQ 3	CAPCOM	A/G	PERFORM VOICE CHECK WITH LM	- Act 14
SEQ 4	TELCOM	FD	ANNOUNCE TEST GO/NO GO AND NOTIFY CAPCOM TO PROCEED TO FM MODE.	
SEQ 5	CAPCOM	A/G	INSTRUCT CREW TO PROCEED TO FM MODE.	
SEQ 6	CAPCOM	NET 1	INSTRUCT MSFN SITE TO CONFIGURE FOR LM MODE 6.00.09 HBR	
SEQ 7	MSFN SITE	NET 1	VERIFY LM MODE 6.00.09 HBR	- FM - Act 15
SEQ 8	TELCOM	FD	NOTIFY CAPCOM TO PROCEED WITH THE VOICE CHECK.	step 4
SEQ 9	CAPCOM	A/G	PERFORM VOICE CHECK WITH LM	
SEQ 10	TELCOM	FD	ANNOUNCE GO/NO GO FOR TEST AND NOTIFY CAPCOM TO PROCEED TO PM MODE.	
SEQ 11	CAPCOM	A/G	INSTRUCT CREW TO PROCEED TO PM MODE AND THEN TO B/U VOICE TEST STEP 1	Act 15

TEST 4 - (B/U VOICE TEST)

SEQUENCE	POSITION	LOOP	ACTION
SEQ 1	CAPCOM	NET 1	INSTRUCT MSFN SITE TO CONFIGURE FOR LM MODE 8.04.00
SEQ 2	MSFN SITE	NET 1	VERIFY LM MODE 8.04.00
SEQ 3	TELCOM	FD	NOTIFY CAPCOM TO PROCEED WITH STEP 2

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SEQ 4 CAPCOM A/G PERFORM VOICE CHECK WITH LM

SEQ 5 TELCOM FD ANNOUNCE GO/NO GO FOR TEST AND NOTIFY CAPCOM TO PROCEED WITH STEP 3 ACT 16

SEQ 6 CAPCOM A/G INSTRUCT CREW TO PROCEED WITH STEP 3

SEQ 7 CAPCOM NET 1 INSTRUCT MSFN SITE TO CONFIGURE FOR LM MODE 6.02.00

SEQ 8 MSFN SITE NET 1 VERIFY LM MODE 6.02.00 - Comm Basic

TEST 5 - LM RELAY TEST - voice check only

SEQ 1 CAPCOM A/G NOTIFY LM AND CSM CREWS TO PROCEED WITH LM RELAY TEST AND VERIFY WHEN READY.

SEQ 2 CAPCOM A/G PERFORM VOICE CHECK WITH CSM THRU LM RELAY.

MSFN SITE NET 2 NOTE: VOICE CHECK BOTH WAYS REQUIRED

NOTE: IF VOICE MODULATION IS OBSERVED ON CSM DOWNLINK - REPORT TO MCC COM TECH. - POSITIVE REPORT

COMM TECH COMM TECH NOTE: REPORT CSM VOICE DOWNLINK TO CAPCOM

SEQ 3 CAPCOM FD ANNOUNCE GO/NO GO OF TEST AND PROCEED TO CSM RELAY TEST. Expect Echo

TEST 6 - CSM RELAY TEST

SEQ 1 CAPCOM A/G NOTIFY LM AND CSM CREWS TO CONFIGURE FOR CSM RELAY AND VERIFY WHEN READY.

SEQ 2 CAPCOM A/G PERFORM VOICE CHECK WITH LM THRU CSM RELAY. NOTE: VOICE CHECK BOTH WAYS REQUIRED

MSFN SITE NET 2 NOTE: IF VOICE MODULATION IS OBSERVED ON LM - REPORT TO MCC COM TECH - POSITIVE REPORT

COMM TECH COMM TECH NOTE: REPORT LM VOICE DOWNLINK TO CAPCOM Report.

SEQ 3 CAPCOM FD ANNOUNCE GO/NO GO FOR TEST AND PROCEED TO MSFN RELAY TEST

TEST 7 - MSFN RELAY TEST

SEQUENCE	POSITION	LOOP	ACTION
SEQ 1	CAPCOM	A/G	INSTRUCT CSM AND LM TO CONFIGURE FOR MSFN RELAY TEST AND VERIFY WHEN READY.
SEQ 2	CAPCOM	NET 1	INSTRUCT MSFN SITE TO CONFIGURE FOR

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MSFN RELAY.

SEQ 3	MSFN SITE	NET 1	VERIFY READY FOR MSFN RELAY WITH ONLY CSM REMOTED TO NET 1
SEQ 4	CAPCOM	A/G	INSTRUCT CSM AND LM TO BEGIN VOICE CHECKS THRU MSFN RELAY.
SEQ 5	CAPCOM	FD	ANNOUNCE GO/NO GO OF TEST.
SEQ 6	CAPCOM	A/G	NOTIFY CSM AND LM THAT COMM CHECKS ARE COMPLETED AND TO RETURN TO BASIC COMM CONFIGURATION.
SEQ 7	CAPCOM	NET 1	INSTRUCT MSFN SITE TO DISABLE MSFN RELAY AND TO RETURN TO NORMAL CONFIGURATION. LM - 6.02.00 CSM - 6.02.00
SEQ 8	MSFN SITE	NET 1	VERIFY CONFIGURATION.

15/0135Z MAY HMSC

FLIGHT DIR MISSION LOG	DAY	RE	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	PGNES D/b test OK		
111	CSM		
111+30	LOS - Systems good - LMP asleep @ 111+00 hrs		
111+52	Back in AGS to avoid Min D/b		
112+15	AOS - CSM Systems good LMP sound sleep		
112+28	LM Going back to PGNES - getting ready for test 4		
	Note TV will be 4 hours later - 10pm vs 6pm		
112+32	CSM Pri loop Max 74°		
112+47	Trying to get LM attitude changed 5°		
113+18	Retro has several TEI PADS available		
113+40	LM Wide in wide D/B - AGS Getting ready for test #5 23 fps ΔV		

FLIGHT DIR MISSION LOG	DAY	REV	PG 171
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
114+06	CM TEST #5 ACCOMPLISHED-		
114+13	AOS - Systems Good-		
	EPA		
	UPDATED CM ΔV AT JETTISON = 5FPS		
114+33	PR1 LOOP - MAX 73°		

FLIGHT DIR MISSION LOG	DAY	REV	PG 172
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	LM Test #5 Completed		
115:18	AHU, BAH LM RCS TM indicators of TCP failed on Proceeding with LM Test 6		
115:31	Guid. O. wants to look at LM's estimate of its state vector		
	$65.9 \times 55.6 = \text{CSM orbit}$		
	<u>EECOM Briefing</u>		
	1. 75°F = max Rad Out Temp		
	2. H ₂ Tank 1 - Auto Tank 2 - OFF		
	3. Evap still has not been reserviced		
	4. What happened to tunnel venting		
	FIDO		
	LM Ascend stage has gone hyperbolic 54M or		
	②		

APOLLO 10 MISSION

Sixth Report

(96 through 120 hours)

The mission has progressed satisfactorily. The major activities during this period were lunar module undocking, descent to near the lunar surface, rendezvous, and ascent engine firing to depletion.

At about 99 hours, the lunar module was undocked, and a separation maneuver was performed with the service module reaction control system to place the command and service modules into an equiperiod orbit. One-half revolution later, the descent orbit insertion maneuver was conducted using the lunar module descent propulsion system.


The first pass over Apollo Landing Site 2 was made near the pericynthion altitude of approximately 8 miles. During this pass, a check of the landing radar and visual observation of the landing site area were made. At about 101 hours, a posigrade phasing maneuver was performed with the descent engine using variable throttling. This maneuver boosted the lunar module to a 190-mile apocynthion altitude. The lunar module was staged just prior to the insertion maneuver, which was performed at about 103 hours, using the ascent propulsion system. This maneuver resulted in an orbit of about 11 by 45 miles, close to the planned elements, and established the desired conditions for initiating rendezvous.

Coelliptic sequence initiation was performed behind the moon at about 104 hours using the reaction control system. This maneuver established both the proper terminal phase conditions and the differential height between the orbits of the two vehicles close to the planned value of 15 miles. The constant differential height maneuver, executed one-half revolution later, was 3.7 ft/sec. The terminal phase was initiated at 105-1/2 hours. Lunar module braking was performed satisfactorily behind the moon, and the two vehicles were station-keeping when signal was acquired by the ground stations. Docking was performed by the command and service modules at 106-1/2 hours.

At the beginning of the insertion maneuver, the lunar module developed a high rate. The crew took manual control of the firing to avoid gimbal lock and completed the maneuver. Shortly after completion of the firing, it was determined that the mode control switch of the abort guidance system was in the "auto" position, in accordance with the checklist. The checklist was improper, and the switch should have been in the "attitude-hold" position. Also, during the latter portion of the low-altitude pass over the lunar surface, two camera failures were encountered. However, a preliminary evaluation indicates that a majority of the required photography was accomplished.

Overall system performance has continued to be nominal during this period. Network communications with both spacecraft have been satisfactory. The planned television transmission during the ascent engine firing to depletion was cancelled because of crew time constraints. The high-gain antenna on the command and service modules operated satisfactorily in the automatic reacquisition mode during the crew rest period.

The thermal characteristics of the two spacecraft remained within expected limits. Consumables usage has been nominal.


Donald D. Arabian
Evaluation Manager

APOLLO 10 MISSION PROBLEM LIST (CSM)

March 11, 1969

ITEM NO.	VE		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
1	X		(PRELAUNCH) Command module reaction control system A Helium manifold pressure decay	Leak rate remaining constant. Tests indicate no degradation due to shock from 50 to 300 psig for leak in tubing.	Ferguson		
2	X		(PRELAUNCH) Fuel cell 1 oxygen flowmeter failed	Caution and warning was affected when switching selector from fuel cell 2 to fuel cell 1. There is no constant caution and warning.	Ferguson Kingsley		
3	X		(PRELAUNCH) Command module reaction control system B helium manifold pressure abrupt drop from 44 to 37 psi when propellant isolation valves opened.	Burst disc on oxidizer system ruptured.	Ferguson		
4	X		(PRELAUNCH) Suit loop water separator breakthrough	Change in wick wetting technique was successful	Hurt		
5	X		(GET 00:07:00) Primary environmental control system evaporator dried out.	Switch to secondary evaporator at 00:15:00. Primary evaporator re-serviced at 73:15:00. Dried out again. Await postflight tests.	Hurt		
6	X		(GET 01:47:00) Thin white line on right hand side window (top to bottom).	Await postflight debriefing	Wade		
7	X		(Approximate GET 02:38:00) Crew reported high frequency vibration prior to completion of S-IVB translunar injection firing.	Data from spacecraft shows about 16 Hz, 0.1g peak-to-peak. Rates show 0.4 Hz, 0.1 deg/sec. No significant vibration.	Wade	CLOSED	

APOLLO 10 MISSION PROBLEM LIST (CSM)

ITEM NO.	VEHICLE		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
8	X		(Approximate GET 02:36:00) High oxygen flow caution and warning during translunar injection firing. Cabin oxygen regulators operated at same time.	Caused by combined flow of cabin purge and make-up oxygen by the cabin pressure regulator	Hurt	CLOSED	
9	X		(GET 10:20:00) Carbon dioxide partial pressure readings 1.2 mm Hg; should be lower	Readings are not consistent with anticipated values when cartridge changed.	Gillen		
10	X		(GET 24:06:00) Program alarm 122 occurred while or immediately after the crew was observing the earth through optics	System analysis to determine possible causes	Hanaway		
11	X		(GET 23:47:00) (48:20:00) Environmental control system oxygen manifold pressure dropped to 75 psi (should be 100) for about 3 seconds during redundancy checks.	One regulator supplying the demand of two emergency repressurization regulators wide open will drop manifold pressure to 72 psi as measured in tests. There is also considerable scatter of the manifold pressure, as indicated from all available data. No abnormal condition is indicated.	Hurt		Test Change Notice to be prepared to test system same in ground tests as in flight for 107 and subs.
12	X		(GET 32:00:00) Water/gas separator does not operate satisfactorily.	A procedure for separating gas.	McAllister		
13	X		(GET 26:28:00) Digital event timer on panel 1 jumped 2 minutes during countdown prior to first midcourse correction (second planned correction).	First time minutes jumped. Circuit study and test in progress.	Lattier		

APOLLO 10 MISSION PROBLEM LIST (CSM)

ITEM NO.	VEH.		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
14	X		(GET 03:27:00) Thermal coating on forward hatch flaked off during lunar module cabin pressurization.	Fix for 107 and 108. Film is no longer a thermal requirement. Removed from 109 and subsequent per CCB.	Wade		
15	X		(GET 96:28:00) Tunnel would not vent	Lunar module depressurized	Hurt/Wade		
16	X		(GET 94:28:00) Simplex-A not operating	System operated properly later	Kingsley		
17	X		(GET 98:33:00) No down-voice from command and service module	Ground problem; Goldstone was receiving down-voice. Problem corrected at 98:39:00.	Kyle	CLOSED	
18	X		(GET 99:15) Transponder in command module had to be cycled to get rendezvous radar tracking		Kingsley		
19	X		(GET 100:50) Lunar module camera failures	Hasselblad failure is within camera. Film pack and batteries OK. Sequence camera failure due to alignment of one film cartridge. Camera operating properly.	Abbey		
20	X		(GET 121:11) AC circuit breaker to fuel cell 1 open; reset gave undervoltage indication	Fuel cell 1 open-circuited at 121:16	Ferguson/Kingsley		

APOLLO 10 MISSION PROBLEM LIST (LM)

MAY 23, 1969

[Handwritten signature]

ITEM NO.	VEH		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
1		X	(GET 85:10:00) Crew reported that the lunar module potable water contained air	Awaiting crew comments to determine whether condition persisted. Improper servicing of the lines would cause initial air.	Gillen/GAEC		Following crew debriefing
2		X	Noise in cabin a. S-band antenna movement noise b. Glycol pump noise bad c. Suit fans	a. Normal, similar to altitude chamber comments b. Fix available (flex lines) c. Fan will be used when necessary only	GAEC/CCB		
3		X	(GET 82:20:00) Abort guidance system deadband switch indicated max. on telemetry when in min. position	This is normal for circuit breaker open. Worked correctly after system powered up.		CLOSED	
4		X	Instrumentation discrepancies a. Glycol temperature read zero during first manning; later normal (82:45:00) b. Chamber pressure switches failed on reaction control thrusters--- B3D (97:34), B4U (98:31) c. Cask temperature read properly prelaunch, read open inflight d. Reaction control system A manifold pressure went to zero (108:30) e. Descent propulsion fuel pressure GQ3501 read zero in cabin, telemetry normal	b. Similar occurrence on LM-3 c. Cask temperature switched at altitude by barostat. Not checked out at altitude. Action to perform checkout. d. System operation was normal.	GAEC/Hurt Small/Packham/GAEC Kingsley/GAEC GAEC/Walsh	CLOSED	

APOLLO 10 MISSION PROBLEM LIST (LM)

ITEM NO.	VE		DESCRIPTION	ACTION IN PROCESS	ACTIC ASSIGNED TO	STATUS	TIMATED COMPLETION TIME
	CSM	LM					
4		X	Instrumentation discrepancies - Continued f. Ascent propulsion oxidizer manifold pressure 187 on telemetry, 180 in cabin; predicted was 170 psi (GP1503) g. Absolute pressure in glycol system not steady	f. Based on accuracies, loading, and temperature variation, condition not abnormal. g. Variation one indication of no air in loop.	GAEC/Walsh		
5		X	Simplex-A not operating at 94:28:00	Recheck of system after docking showed system operating. Analysis of configuration of understand what happened. Need crew debriefing. Corona being considered.	Kingsley/GAEC		
6		X	Backup voice noisy while on omni	Associated with receiving command module and lunar module through same ground circuit. Attitudes, signal strengths, and configuration being analyzed.	Kyle/GAEC		
7		X	S-band steerable antenna operation showed loss of lock and drive into stop	Analysis of lock angles and signal strength required to understand the indicated operation. Need crew debriefing. Analyze operations through entire operating periods.	Kyle/Kingsley/GAEC		
8		X	Rendezvous radar alarms during first marks, indicating bad inputs to computer a. 101:09:29 - Range rate read minus 9800 ft/sec; should be about 200 ft/sec b. 103:14:24 - Read 9999 ft/sec; should be 295 ft/sec c. 104:37:00 - Read 6722 ft/sec; should be minus 124 ft/sec (no alarm) d. 105:17:00 - Range read 22 n.mi.; should be 40 n.mi. (range rate may also have been in error)	Circuit being analyzed. Could be associated with computer timing between rendezvous radar buffer and input to the computer.	GAEC/Hanaway		

APOLLO 10 MISSION PROBLEM LIST (LM)

ITEM NO.	VEHI		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
9		X	Abort guidance versus Verb 83 in primary guidance computer local vertical different by 20 deg; no difference after undock.	K factor (time register) syncs time between primary and abort guidance, was loaded incorrectly in last two digits; was updated between events; simulation to be run to verify	GAEC/Hanaway		
10		X	Apparent gimbal drive actuator pitch failure; telemetry indicates actuator never moved a. ac transient may be associated; 124 V peak (phasing burn) b. Caution and warning on actuator fail during phasing burn	Roll actuator worked normally. Data on low bit rate was erratic; further analysis may indicate alarm normal	GAEC/Hanaway		
11		X	Large attitude excursions during staging	Abort guidance mode control switch was in "auto" rather than "hold" and apparently in maximum deadband. Manual control overrode. The abort guidance "auto" configuration was attempting to point the lunar module Z axis at the command module as set into the abort guidance. Simulation results show what happened is associated with the abort guidance mode switch. Checklist improper (omission).	GAEC/Hanaway/ North		
12		X	During descent propulsion phasing, caution and warning and alarm a. Gimbal warning b. Low level sensor	Check for other indications on telemetry a. See item 10 b. Similar to LM-3; bubble passage.	GAEC/Kingsley		
13		X	Crew commented that reticle was bad during platform realignment after phasing burn	Await postflight debriefing	Hanaway		
14		X	Glycol pump switchover prior to ascent propulsion firing during cabin closeout	May be normal per procedure; explain	Hurt/GAEC		

FLIGHT DIR MISSION LOG	DAY	REV	PG 183
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
124+05 ⁰⁴¹³⁷	Acquisition GDS		
	Coming up to F-1		
	FC#1 looking OK		
	Normal voice - much better		
	Secom expects FC 2 & 3 skin T to stabilize at $\approx 425^{\circ}F$ - can sustain 95 A at that Temp.		
	Finished with F-1 and 130 tracking		
	CPI not sure he tracked some ^{sextant} one.		
	CP2 sure - sextant		
	F1 " - telescope		
	130 " - sextant		
	"Eyeball's OK" -		
	State vector		
	TEI ₂₆ PAD		
	REV 26 MAP Update		
	Landmark track ped.		

FLIGHT DIR MISSION LOG	DAY	REV	PG 184
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Small torquing C's		
	Tom wants to delay TV until 132 400		
	Site 130 - started 50 sec early. F-1 - only 4 marks - spacing good		
	Tom wants attitude for TV		
	67.3 X 54.7 onboard		
	LOS		
126+03	Acq at GDS Standing by Coming up on 130		
FC#1 plan	Decay 3-4°/hour on FC#1 375° F at 1.5 prior to TEI Bring FC #1 on 1.5 prior to TEI. Should carry 20A initially and should heat up at 30°/hour. Will want to open circuit again at 420° F.		

FLIGHT PLAN UPDATE

TIME	ITEM
128.29	REST ATTITUDE :
	R 090°
	P 226°
	Y 000°
	HGA : P -04°
	Y 244°

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

Waiting 20 secs after T₂ time

Saw the descent stage - going to catch up w/ him - he's torqued out of plane to south. Can see legs and colors.

Eccon doesn't think we need to purge H₂ to get rid of water - I kinda think we should try to remove water if we can. He's going back to look at it.

Will brief crew on TV plan.

126+30

Finished 130 tracking.

Lost pass CP1 was ~~CP1~~ same as Rev 2
 CP2 same
 F-1 same
 R0 same

Only got 4 marks on CP2

State vector

Map and landwork updates

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

TET pad

Discussed TV plan for REV 29
and REV 31

126+52

Start charging Batt B

P52 complete & good

Oblique TV only on REV 29 - not
on REV 31~~FC#1~~Need to tell crew not to use
the FC#1 inline ltr.

Stir all cryos + turn fans off ✓

Optics power off ✓

SCS electronics to ECA - Turn off GDB

O₂ T_h 2 auto - heatersO₂ T_h 1 offH₂ tank 1 autoH₂ tank 2 off

Battery charge B

Power the HGA

Pre sleep
data

APOLLO 10 PROPOSED STOWAGE
FOR LM CAMERAS AND CARTRIDGE

FLIGHT PLAN UPDATE	
TIME	ITEM
	Hasselblad and Sequence Camera
	Stow temporarily in compartments F-1 and F-2. After removal of unsuited reentry provisions, wrap individually both cameras in available garments and stow in <u>compartment A-5</u> (Hasselblad was planned to be stowed there for reentry).
	<u>LH ECS Cartridge</u>
	1. Attempt to encapsulate cartridge with plastic material to preclude cartridge "breathing." Use fecal bags and tape as required.
	2. Roll up bagged cartridge in the third sleeping restraint (the one without fittings on the end). Stow in <u>food compartment I-3</u> .
	3. Stow helmet planned to be stowed in I-3 on a suit. Suit to be stowed in the LH sleep restraint attached to normal "use" fittings. Stow helmet end of suit towards hatch.

*This not passed up -
we will do after TET sometime.
He's got everything tied down
for the TET Burn*

FLIGHT DIR MISSION LOG	DAY	REV	PG 187
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
128+02	Acq.		
	Landmark tracking		
	Camister B/A @ 127:00 hours		
	T&I ₂₉ PAD		
	State Vector		
	Power config for sleep posed up.		
	Briefed on FIC plans		
	Land mark		
	CP-? only got 4 marks		
	CP-1 & F-1 on first pass should be		
	kept thrown out		
	John guarantees all 130's OK.		
	Configured DAP for B & C attitude		
	control.		

FLIGHT DIR MISSION LOG	DAY	REV	PG 188
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	EECOM -		
	Batt B - ★		
	FIDO - 68.1 X 53.7		
	apogee 92°W		
	Stowage O.K. for TE1 - will work		
130+01	- AOS - CSM looks Good		
	★		
	TE1-29 ON BOARD - have others available in trench		
	CDR Asleep -		
	S/C in 5° D/b vice 10° - NO PROBLEM		
	4200 Max ΔV - Stay to ^{REV} 735		
	4700 Max ΔV - Stay to REV36		
	Pu Value - to increase shortly after activating second bank of ball valves ✓		
	Work SPS burn time - vice shut off criteria		
	2 sec and $V_e > 40 \text{ SEC}$		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			190
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Go for nulling of $\pm z$ residuals 3 f ps		
	PAD Value is correct? on TEI 3 OR 4 SEC DIFFERENCE FROM CMC		
	370° Lower Limit for F/c ABOUT 380 420° upper -		
131+59	- AOS - CSM looking good - Just a nap - No Pills		
132+03	TEI 30 PAD UP		
132+03	State Vector up - F/c 1 SKIN TEMP DECREASING @ 4°/HR		
132+06	TV is already ON - Coming in CMC in block		
132+14	Can See Snoopy Below him - & behind now - was ahead		

G. Low

LM SIX O'CLOCK STATUS REPORT

The following represents an assessment of LM status based upon the data received during the LM communications activation and checkout conducted during the period 82 to 84 hours GET.

1. LM Guidance and Control

Except for heater circuits the LM G&C equipment was not activated during this period. Associated instrumentation, however, was enabled.

The following temperatures, all within expected limits, were monitored.

ASA : 121.03°F
PIPA: 129.9°F to 130°F
LR : 69°F to 75°F
RR : 30°F

One potential problem was discovered. The AGS deadband switch read MAX on telemetry, should be MIN. The crew checked the actual switch position and verified the MIN position. The crew cycled the switch to MAX and back to MIN and no change (always MAX) was observed on telemetry. This was probably caused by a low resistance path through several ATCA relay coils that exists when the ATCA circuit breaker (4CB82) is open. The SCEA sees this low resistance and indicates a "closed circuit" or MAX deadband. This path is shown in Figure 1. It goes through the diode, through the coils of the deadband select relays and the Ascent/Descent select relays in ATCA and back to the SCEA.

When the ATCA circuit breaker is closed the diode is back biased preventing this sneak circuit.

Similar conditions were observed in other applications of this type signal conditioner with circuit resistances on the order of 150,000 ohms. This circuit is well below that value so the MAX deadband will be indicated anytime 4CB82 is open, regardless of the switch position.

If the minimum deadband could not be selected through the AGS deadband select switch, and the PGNCS failed after DOI the following changes to the nominal flight plan should be made to the nominal flight plan. (Note: In AGS control the minimum deadband is automatically selected for APS and DPS burns.)

- a. Perform the CSI burn with APS.
- b. Perform the TPI burn with APS.
- c. Perform a LM inactive docking using the AGS pulse mode.

The execution errors which will occur when performing CDH, MCC-1, MCC-2 (nominally zero burns) and braking with the RCS in maximum deadband will be negligible.

2. LM Radar

The only two measurements from the radar S/S are the LR and RR antenna temperatures which are performing as expected.

3. LM RCS

PQMD of Systems A and B: No PCM data, C/BN for both instruments are open - nominal condition.

Helium Tank Pressure Systems A and B: Systems A and B helium pressure dropped 1 and 2 bits respectively from their nominal prelaunch values. This decrease can easily be attributed to the decrease in temperature noticed on the fuel tank temperature transducer.

Fuel Tank Temperatures of Systems A and B: A temperature decrease of 2° and 4° occurred on Systems A and B respectively. Nominal values of fuel temperature is 70°F ± 20°F. Present reading on System A is 71°F and System B is 69°F.

Regulator Outlet Pressure Systems A and B: 1.0 and 2.0 psi increase from prelaunch values noted on Systems A and B respectively. Increase due to a within specification leak across the quad check valves.

Manifold Pressures for Systems A and B: A decrease of 3 to 1 psi noted from their prelaunch values. This difference is due to the noted decrease in fuel tank temperature.

Quad Temperatures: Quad temperatures decreased from their prelaunch values by +7, +6, -15, and +5°F on Quads 1, 2, 3, and 4, respectively. These changes are normal based on the spacecraft flight orientations since launch. Quad temperatures ranged from 58°F to 81°F at 83:40:00 GET.

All valve positions are indicated as normal.

CONCLUSION: All parameters normal and as expected.

4. LM DPS

Table 1 summarizes data at launch, LM power up (GET 83:00), and expected values for next LM power up (GET 94:00). Data indicates normal conditions. The SHE tank pressure rise rate was 5.9 psi/hr from launch to GET 83:00 or about 1.4 psi/hr less than experienced on ground tests. A similar decrease in pressure rise rate

from ground to flight zero-g coast was experienced on LM-3. Because of a known leak after the first LM-3 DPS firing it was not clear whether the reduced rise rate was due to zero-g coast or a smaller leak prior to the first DPS burn. It now appears that the reduced pressure rise is normal and due to a smaller heat leak in zero-g coast. Two minor discrepancies are discussed below.

a. The ambient start bottle pressure decreased from 1619 psia to about 1589 psia. This pressure drop would require a 10°F temperature drop. The propellant bulk temperatures indicated about a 3°F drop. It is possible that the helium bottle temperature would drop more than the bulk propellant temperatures. In addition the measurement has a sensitivity of 8 psi per bit count. Although a very small leak is possible it is more likely that the 30 psia pressure drop is due to a combination of temperature decrease and transducer sensitivity.

b. At GET 83:00 the fuel interface pressure decreased to 154 psia at 70°F from 188 psia and 73°F at launch. This pressure drop is about 9 psia greater than expected due to solubility. This lower pressure is believed to be a predication error. An error in solubility prediction will be verified by no further pressure drop at the next LM power-up.

5. LM APS

Table 1 summarizes data at launch, LM power up (GET 83:00) and expected values for next LM power up (GET 94:00). The data is normal except for ox interface pressure which is discussed below.

5.1 LM APS Oxidizer Tank Pressure

During the initial LM activation period, the telemetry indicated that the oxidizer interface pressure measurement GP1503P had increased to 187 psia from a prelaunch value of 178 psia. The observed propellant temperatures corresponding to these pressures are 71°F and 73°F respectively. The predicted interface pressure corresponding to the 71°F oxidizer propellant temperature observed in lunar orbit is 172.5 psia. This is based on temperature drop and solubility of helium in propellants.

Consultation with the cognizant thermal control personnel indicates that observed propellant temperature behavior agree with predicted values within $\pm 2^{\circ}\text{F}$. With temperatures holding near constant, pressure levels should either remain constant or decrease due to helium solubility in the propellants. In order for tank (or interface) pressures to rise, an increase in helium mass in the ullage would be required. The data available to us proves that no mass is being added to the ullage from the

only possible source, namely the helium supply tanks. The conclusion reached from the above considerations is that the GP1503 measurement is erroneously high. This conclusion is further substantiated by the agreement of observed data with predictions on the LM-4 fuel side and also both fuel and oxidizer measurements on LM-3. Attached are pertinent data observed during LM-4 launch and first LM power-up in lunar orbit.

Fuel Interface at Launch	- 167 psia
Fuel Interface Now	- 166 psia
Fuel Tank Temperature at Launch	- 73°F
Fuel Tank Temperature Now	- 71-72°F
Fuel Tank Ullage Pressure at Launch	- Unavailable
Fuel Tank Ullage Pressure Now	- No crew readout
Predicted Fuel Tank Pressure at 71.59	- 167 psia
Ox Interface at Launch	- 178 psia
Ox Interface Now	- 187 psia
Ox Tank Temperature at Launch	- 73°F
Ox Tank Temperature Now	- 71°F
Ox Tank Ullage Pressure at Launch	- Unavailable
*Ox Tank Ullage Pressure Now	- Approx. 180 psia
Predicted Ox Tank Pressure at 71°F	- 172.5 psia

*Cabin Display graduated in 10 psi increments and results in relatively low resolution capability.

6. LM EPS

During the communications checkout for which LM power was utilized from 82:29:20 to 84:32:00 all LM power measurements were nominal. The descent batteries were never switched from low voltage to high voltage taps as the bus voltage didn't achieve the 27V maximum requirement until the end of housekeeping. AC voltage was 118.1 volts with a frequency of 400.1 Hz. Battery currents ranged from 2.6 amps minimum to 5 amps maximum. The ascent batteries remained above/= 37 volts and the descent ranged from 33.7V maximum to 32.3 volts minimum.

After crew transfer the LMP reported closeout voltages of 37.8 on all four descent batteries and 27.2 volts on the two busses. This is only possible if the LMP transferred power to CM and subsequently took these measurements. This is out of context according to the checklist. It appeared possible that the SCEA and EPS display breakers might have been closed at cabin closeout, however, a check with the crew negated this possibility. Even if these breakers had been left closed it was determined that no SCEA thermal problem existed.

Based on all of the above there is no recommendation for any changes to the flight plan for tomorrow, and the LM EPS is considered ready for tomorrow's activities.

7. LM Instrumentation

The following information is the present assessment of measurements at GET 82 hours.

a. ECS Glycol Temperature (GF9998U): Glycol temperature read zero on telemetry. This data was confirmed by the crew reading the vehicle display meter.

Impacts:

(1) Two additional glycol temperature measurements (GF2531 and GF2581) exist on the H₂O boiler input and output. They serve as adequate backup (telemetry only) for cooling loop status.

(2) Glycol Temperature (GF9998) is an input to C&WEA. The threshold for an alarm is whenever the temperature is greater than 50°F. Since the temperature is reading zero the alarm will not be actuated in this failure mode. Therefore there is no requirement to advise the crew of a false caution and warning master alarm.

(3) No change in mission plans is suggested for this problem.

b. MIN/MAX Deadband (GH 1603); Figure 1: This measurement (discrete) was reported to remain in the maximum mode when the crew switched from MAX to MIN deadband. Two possible causes exist

(1) Failure of the deadband select switch.

(2) SCEA conditioner indicated no change of state because ATCA was not powered up. Reference to Figure 1 indicates a relatively low resistance path through the diode and around the deadband select switch when the ATCA is not powered up (4CB82 open). When the ATCA is powered up the diode is back biased so the sneak circuit does not exist.

c. APS Ox Press - GP1503: This measurement is suspect because of unusual pressure rise experienced since launch.

At launch this measurement read 179 psia. It was predicted to read approximately 170 at GET 82 hours. It read 187 on telemetry.

The ullage pressure measurement (GP1001P) read by the crew was 180 psia. These two measurements are redundant and should read the same.

The data seems to indicate that the transducer has shifted since launch.

Impacts:

This pressure measurement (GP1503) is an input to the C&WEA. Therefore the low trip level which is set at 119 psia may be shifted.

d. GL8275T, RTG Cask. Temperature, reads "H" indicating 500°F or greater. The expected maximum with the inactive cask is 150°. This measurement consists of a transducer on the cask, a transducer behind an adjacent thermal shield, and a barometric switch which changes the input of the SCEA from the cask transducer to the transducer behind the shield after a predetermined altitude has been reached. This switch was installed on LM-4 approximately 4 weeks before the launch. The possible causes are a broken wire, a switch hung between both positions, or a bad transducer.

LM high bit rate telemetry has performed as expected during this period and all other measurements are performing well.

The instrumentation subsystem is considered ready for DOI day.

8. LM Communications - MSFN and Spacecraft

A combination of LM/MSFN omni and steerable antenna modes were checked during revolution 4. Good quality voice was received while using backup voice on the omnis. Good quality voice and high bit rate telemetry were received in both the PM and FM modes while the LM was on the steerable antenna. The received up-link carrier power during steerable operation corresponded to preflight predictions. The checks indicate that good quality voice was received while the LM was configured for down-link normal voice with low-bit rate. This is not consistent with preflight predictions. ~~Preliminary investigation indicates that the LM may have been in down voice BU.~~

he went
The echo during the simultaneous up voice BU - down voice BU test is a design characteristic of the LM for the combination of backup modes selected.

It should be noted that no relay modes were accomplished during the initial activation period (LM relay, CSM relay, and MSFN relay).

As a result of the communications performance during revolution 4, the system is considered ready to support DOI day activities.

9. LM ECS

a. System status is good.

(1) GOX and water tank pressures are the same as prelaunch.

(2) Glycol pump operation was as expected.

b. Loss of glycol temperature measurement GF9998U is not important--back up measurement GF2581 will replace this measurement.

c. Contamination of LM with CM insulation could cause a problem with sealing of cabin dump valve and the hatch itself. Attempts will be made to clean up LM when activated. No anticipated detrimental effects on ECS equipment except for possible clogging of the screen shielding the cabin gas return valve. This is a fine screen and is not accessible to the crew for cleaning. If the screen clogs to the point where the suit flow is too low, the crew must go to closed suit mode to restore cooling. This will have no effect other than the crew's helmets must be on.

d. Excess O₂ usage from CSM is a CM problem due to debris clogging a screen in the system.

e. Air in drinking water; the LMP said that he got "4 gupls of air" out of water gun when drinking. This could be due to air in the hose caused by not filling the water system with the drink valve open so that water is right up to the gun. KSC is being questioned as to the procedure used for filling the system and the position of the drink valve during the fill.

f. Based on the data reviewed from the LM status checks the ECS subsystem is considered ready for DOI day.

CONCLUSION:

The review of LM subsystem status summarized above has revealed no problems which will prevent continuance of the mission in accordance with the current flight plan.

TABLE I
 PROPULSION PREDICTIONS FOR LM POWER-UP
 AT GET 94:00

I DESCENT PROPULSION SYSTEM

<u>Parameter</u>	<u>GET</u>		
	0:0	83:00	94:00
Ambient Start Bottle Press (GQ3015)	1619	1584-1591	1584-1591
Regulator Outlet Press (GQ3018)	57	102.4-103	109
Sc Helium Tank Press (GQ3435)	316	798-806	863-871
Fuel Interface Press (GQ3611)	188	153-155	153-155
Oxidizer Interface Press (GQ4111)	168	103	103
Fuel Bulk Temp (GQ3718T)	73	70	70
Oxidizer Bulk Temp (GQ4218T)	73	69	69
Regulator Outlet Press (GQ3025)	54	98.4	105

II ASCENT PROPULSION SYSTEM

<u>Parameter</u>	<u>GET</u>		
	0:0	83:00	94:00
Helium Bottle No. 1 Press (GP0001)	3070	3055	3055
Helium Bottle No. 2 Press (GP0002)	3088	3072	3072
Regulator Outlet Press (GP0018)	90	88	88
Regulator Outlet Press (GP0025)	84	84	84
Helium Bottle No. 1 Temp (GP0201)	74	69	69
Helium Bottle No. 2 Temp (GP0202)	75	71	71
Fuel Bulk Temp (GP0718)	73	71-72	71
Oxidizer Bulk Temp (GP1218)	73	71	71
Fuel Interface Press (GP1501)	167	166	166
Oxidizer Interface Press (GP1503)	178	187	187

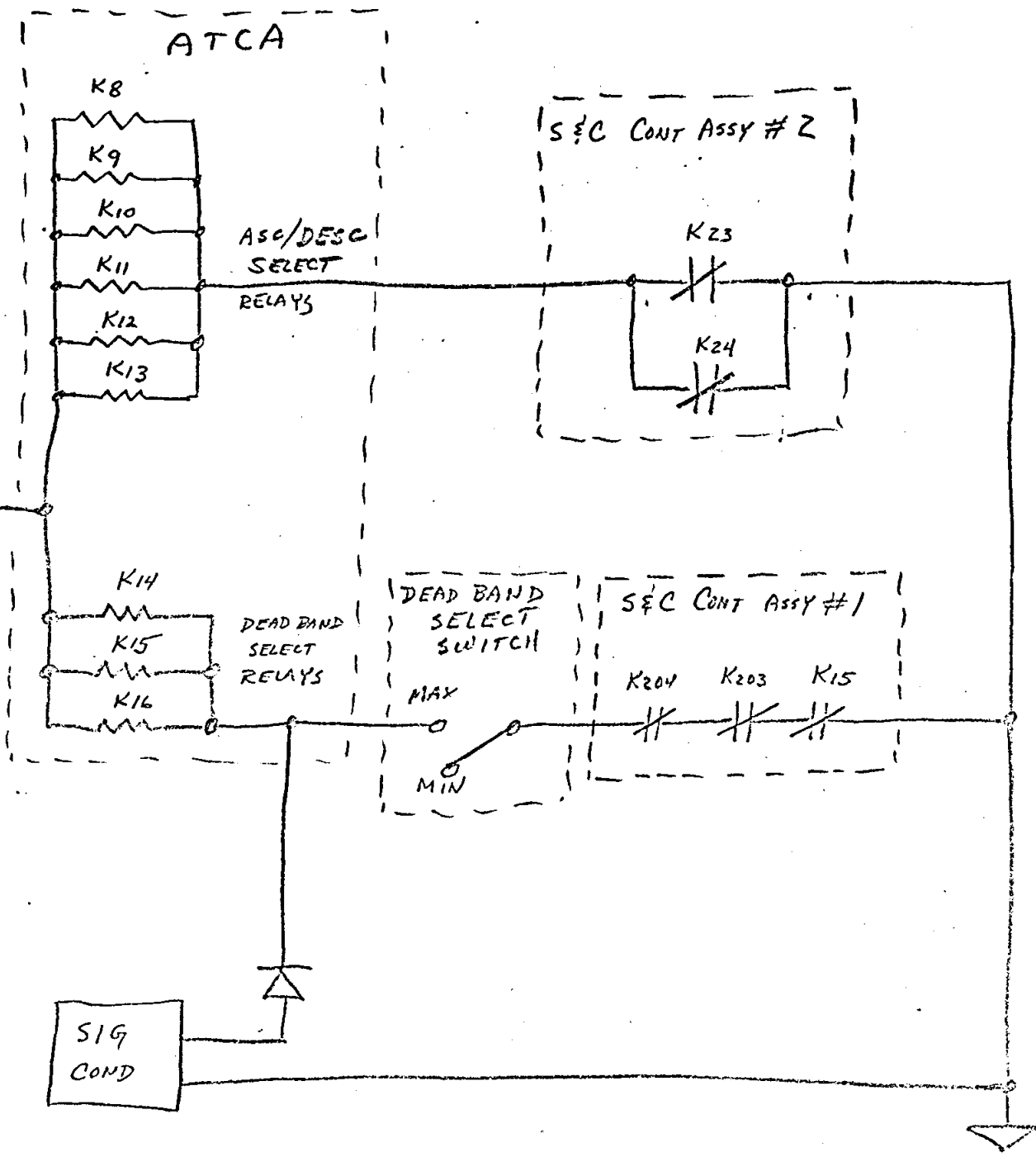


FIGURE 1

FLIGHT DIR MISSION LOG	DAY	REV	PG
			191
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
132+14	- 245° straight out - before		
132+16+10	in plane - 257° - right below 52°E		
	10 NM Maybe below		
	V-83 - range, range rate, θ		
132+31	Have not seen Snoopy for sure since 132+16		
132+33	Lost High Gain Antenna & TV		
	Always ahead of Snoopy		
	definitely below now - before was always ahead & above before		
	- point of closest approach was then		
132+39+10	Snoopy - P-336 +X going across		
132+39+10	340° + X right at him		
132+40	Back in HGA		

FLIGHT DIR MISSION LOG	DAY	REV	PG 142
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
132+43	S/C has lapped Snoopy - behind at 500 - 600 NM @ TEI		
	No earth shine TV at All -		
132+46	Doing P-52 -		
	Also starting DSE Dump		
	Snoopy every sec on land mark tracking - in front + ahead of CSM over horizon, then		
	Voltage 26.8 - 7amps away from MC+W		
132+54	Dump finished		
132+55	P-52 - twice - Good logging		
	68.5 x 53.6 orbit		
133+00	at what point what perihelion		
133+00	perihelion 0.58° $86^\circ 58' E$ -		
	Sunrise back side st up - 90° directly overhead - 133+26		

FLIGHT DIR MISSION LOG	DAY	REV	PG 193
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
133+06	Already shot photo's of opportunity going to do orb site here		
	After F/c's go on - <u>No</u> change to Normal procedures		
133+57	- AOS		
	F/c - #2 - CET - TOP 173°-155° 2 cpm last 35-40 min low side every ^{ten} other cycle Mc+W trips O ₂ flow rate going up+down on both fuel cells - both 2+3		
	Could not see Snoopy - due to lighting		
	Waste Water dump completed		
	Optics now off-		
134+01	± 10° now on TCE		
	told about F/c		
134+05	H/GA now		
134+05	TCE dumped out now		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		

FLIGHT DIR MISSION LOG	DAY	REV	PG 194
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
134+07	Snoopy now out in front going below		
134+06+20	. 350° - 134+06+20		
	Terminated Batt B Charge		
134+12	Program - alarms - transim > 50°		
	P-22 - No problems		
	Passed TE1 F/c Configuration to A-10		
	F/c #2 - prior to LOS saw 1°-2°		
	variation for brief period		
	since AOS - 3°		
	First P-22		
	TGT-150 hard to get - due to low		
	sun angle - #1 was not on		
	site, last 4 were on tgt		
134+33+30	Local vertical - 330° - big bank of		
	Mylar -		
134+34	TE1-31 PAD up -		

Did P-22's with Telescope - could not get with sextant

Flight Director

Apollo Ten Weather Status

prepared 0430Z 24 May 1969

Forecast conditions: EOM

MPL - partly cloudy, east 15 knots, 5 feet, 81 degs and widely scattered showers.

AOL - partly cloudy, east 15 knots, 4 feet, 78 degs and widely scattered showers.

carter

FLIGHT PLAN UPDATE

TIME

ITEM

STORAGE OF LM CAMERAS
AND L10H CANISTER:

WRAP CAMERAS IN LGG
AND STORE IN A8.

L10H CANISTER CAN
BE EITHER -

(1) PUT INSIDE A HELMET
+ STORED IN L3

OR (2) STORED INSIDE ONE
PGA

Passed to Cap Com
Felt 123 + 25
at

[Handwritten signature]


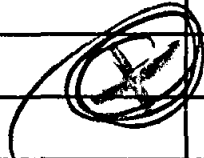
FLIGHT DIR MISSION LOG	DAY	REV	PG
			1915
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
134+42	HGA Antenna		
134+48	State Vector in - - CMC - block		
134+51	DSE Dump - B+D Roll <u>No Failed Quads in DAP</u> enable All Auto RCS Select		
134+55	TCE Starts Cycling due to entering shadow - apparently Characteristics of F/C 2+3 look good - no change required - yet 149.5 - 170.0 - mctw - - 200° - upper limit -		
135+0	- net went around Corner without starting DSE 133+05 LOS 167° - 152° - 133+16 Clock set wrong 133+31 sunrise 167 - 152 133+20 133+56 nos 167 - 152 - 133+26 134+37 sunset		

FLIGHT DIR MISSION LOG	DAY	REV	PG 196
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	225° - fluctuating 250°		
	Purge		
	AOS ① turn on H ₂ line heaters		
	② POO + accept - state Vector		
	ext 2V		
135+56	- AOS -		
	TCE		
135+57	POO + ACCEPT		
	H ₂ Purge Heater ON?		
	TEI DSE NOT ON -		
	- Uplinking -		
136+02	TEI 31 - Confirmed		
136+03	- F/C - 1 Going ON		
	MC+W		
	Descent Strip O.K.		
136+04	F/C bus disconnect then reset OK		
136+04	Uplink complete - block -		
136+06	TEI-32 Up -		
	No MC+W - Same as before		
	light oscillation in O ₂ flow rate		

FLIGHT DIR MISSION LOG	DAY	REV	PG <u>197</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
136+09	P-30 OK - Complete		
	Will turn Auto RCS on after man to TEL		
	Brownish tan		
	- Pippa check OK.		
	Do F/c #2 Purge H ₂ -		
136+21	24 min of H ₂ Purge heaters on time		
	2 min purge		
136+27	- Purge started		
136+30	Purge Completed		
	Hatch Window - TV Attitude		
136+36	Omni Bravo		
136+37	P-52 Started - small torquing angles		
136+43	F/c #1 Rise rate 25°/hr		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			198
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
136+46	P-30 -		
	DISKY looks Good -		
136+49	Auto Maneuver - to TEI ATTITUDE		
136+49	TV attitudes up -		
	Cryo Fans		
136+57	at altitude		
136+58	P-40		
137+02	Hack on TIG - 34:00		
137+45	AOS		
	GNC -- looks Good		
	- o/T - 2+44		
	+ .3 to .2		
	+ 1.6		
	- .2		
	Δ% 19.9		
	6.7% Fuel		
	9.2% dx		
	Pugs o/s high increase		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			199
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
137+48	F/c 1 - Powered down		
	bus voltage 29 27.5 - 27.7		
137+49	TV turned ON		
137+51	F stop / 22		
	V-66 accomplished		
	Moon white -		
137+57	Confirmed Manuever		
	1 fps @ 15 hrs + 5		
138+00	P-00 + accept		
138+03	PTC Reismatt in		
	back to block		
	F/c #1 - SKIN TEMP 429° Max		
138+21	- F/c #2 3° fluctuative 2000		
	40 min Data - Confirms ^{100%} Status		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			200
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
138:50	Orange Shift ON		
	→ TCE on FC 2		
	153° to 166°		
139:01	H ₂ purge line heater - ON 5 minutes ago		
	Power down list for IFC		
139:11	Secondary Gly Pump ON gets		
	MNA Undervolt - Probably a transient		
139:21	FC Purge techniques		
	#1 - No purge		
	#2 - 15 sec ON - 3 sec OFF - 5 times		
	#3 - Normal 80 sec purge		
	BT = 165.2 sec		
	= 2 min 45.2 sec		
	Panned A10 axes to ^{AUTO} immer		
	to PTC attitude		

PTC SET UP

attitude
maneuver
to
PTC

FDAI SCALE - 5/1

RHC LOCKED
V48E (SELECT 0.5° DB)

V46E
V37E00E

V49E

F06 22 LOAD DESIRED PTC ATT
PRO

F50 18 BMAG MODE(3) RATE 2
S/C CONTROL - CMC/AUTO
PRO

06 18 AUTO MANEUVER

F50 18 ENTER (WHEN COMPLETE)

① DISABLE ALL JETS ON QUADS
C and D

WAIT 20 MIN

MAN ATT - Pitch and Yaw - Accel Cmd
ENABLE ALL JETS

INITIATE DESIRED ROLL RATE

WHEN ROLL IS ATTAINED

MAN ATT (ROLL) - ACCEL CMD

INCREASE DB TO DESIRED VALUE

MAN ATT (PITCH AND YAW) -
RT CMD.

CSM SYSTEMS

PRESLEEP CHECKLIST

- VERIFY P/C 1 OFF BOTH MAIN BUSES
- OPTICS POWER SWITCH - OFF
- SCS ELECTRONICS - ECA
- HIGH GAIN ANT TRACK - MANUAL
- HIGH GAIN ANT PWR - OFF
(Will use omnis for PTC) B + OMNI
- CRYO
 - ~~O₂ TNK 2 HTR - OFF~~
 - O₂ TNK 1 HTR - AUTO
 - ~~H₂ TNK~~
 - O₂ TNK 2 HTR - OFF
 - H₂ TNK 1 HTR - OFF
 - H₂ TNK 2 HTR - AUTO
- ALL FANS OFF
- I²O T H₂O Heater OFF

Slake low Secondary by pressure valve

CSM CONSUMABLES STATUS

GET 138400

SHIFT A/O

680
330
350

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>140</u>	<u>190</u>	<u>170</u>	<u>180</u>
FLT PLN MARGIN (16%)	<u>26</u>	<u>70</u>	<u>45</u>	<u>61</u>
PHASE REDLINE (N/A)	<u> </u>	<u> </u>	<u> </u>	<u> </u>
RNDZ REDLINE (N/A)	<u> </u>	<u> </u>	<u> </u>	<u> </u>
ΔV CAPABILITY DAP	<u>183</u>	SCS	<u>110</u>	

SPS

TOTAL Wpu 2387 ~~2470~~ LBS/ 6 - % 997

ΔV CAPABILITY DOCKED N/A fps UNDOCKED ~~703~~ 997 fps

BLOWDOWN ΔV CAPABILITY (UNDOCKED) 34 ~~121~~ fps

BURN TIME-REMAINING 355 ~~355~~ SEC

BATTERY STATUS

~~132400~~ A Ah B Ah C Ah

119

CRYOS

H₂ 26 LBS (0.16) SINGLE TANK LIFETIME 225 GET @ 50 amp.

PRESENT AVERAGE USE RATE .19 LBS/HR

O₂ 355 LBS (+28) SINGLE TANK LIFETIME 249 GET @ 50 amp.

PRESENT AVERAGE USE RATE 1.8 LBS/HR

177

WATER

POTABLE 160.3 %

WASTE 34 %

WASTE AT 85% AT 159 GET

NEXT DUMP AT 149 GET

FLIGHT DIR MISSION LOG	DAY	REV	PG
			201
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Crew wants to sleep late		
	145:42 = GET of 25000 n.mi		
140:24	MC+W - No idea what caused it - Crew punched it off - Did NOT call ground.		
140:25	PTC Started		
	153' to 166° TCE on FC 2		
	<u>G+C Review</u>		
	1. Reviewing TEI playback data		
	2. CM RCS (Rig 1) @ 32 psi		
	leak rate, $\approx .03$ psi/hr.		
	Rig 2 No change		
	3. SM RCS is 16% above flight plan.		
140:59	CDR asleep		
	4. PIPAS + Gyros real good		
141:08	FC 2 TCE 161.7 - 160.1		
141:24	EST GET = 151° before FC1		
	SKIN TEMP gets down to		
	370°F		

FLIGHT DIR MISSION LOG	DAY	REV	PG 202
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
142:02	CDR sleeping deeply considering that it is 11 AM KSC time		
142:24	<p>Playback of TEI data shows no SPS anomalies. All systems looked very good.</p> <p>Attitude excursions were small.</p>		
	Predicted entry time = 19:48:44		
	$69 \times 52.6 = \text{hr/hr on Per 31}$		
143:27	Looking at an optimized sleep cycle which will get the crew back on the pre-flight plan at entry.		
143:33	<p>Power-down Checklist is on page 5 2-14 in the CSM book.</p> <p>This would get currents down to about 30 amps.</p>		
143:50	160 to 161.3 TCE FC2 range during last 1/2 hour		
143:55	Getting 42% HBR		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			203
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Need to switch CP's		
	Expect trajectory update by 145		
144:24	$\delta EI = -7.02^\circ$ - latest update		
145:36	CDR appears to be awake		
145:47	Crew Awake		
145:54	Started Bat A Charger		
	Try to GDS up for TV at 146:45		
146:15	Crew itching from fiberglass Want to take a shower ASAP.		
146:16	PNL 2 - Gly EVAP TEMP IN switch in Auto? - It was in manual - Crew returned it to Auto Slipped TV to 147:10		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Star visibility, description		
	by John indicates he can		
	pick out several of the		
	constellations.		

FLIGHT DIR MISSION LOG	DAY	REV	PG 204
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Change of shift -		
	FC#2 fairly stable -		
	All else OK		
	TV at (147)		
146	FAO AT just HGA -		
	Roll 318 - just HGA		
	p 44		
	y 272		
	Roll 335 left Handwindrow to		
	earth #1.		
	065 - non nominal Tor #5		
	RH		
146/37	MCC Consoles Update		
	Roll 335 #1 to earth		
	065 #5 to non		
	318 p 44, y 272		
	AI - Reseg?		
	- yes -		
	+30, 270		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
146/48	HCB 30 y 270		
	F100 y -6.93		
	14 miles		
	NAV vector -		
146/50	827 update		
	F100		
	184K, 178 ft		
147	184,178 nm from earth		
	28,980 mi from moon -		
	HCB Verify Manual Auto - 147/87		
	Good Morning Bruce -		
147/04/30	HCB 148		
	F100/148/39/03 above lunar sphere		
	of influence -		
	179,525 Equal potential point -		

FLIGHT DIR MISSION LOG	DAY	REV	PG 205
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
<u>147/09</u>	MCC H ₂ Austria		
	Range on H ₂ - 20 kms -		
	Single Tank Lifting - 225 GBT -		
	30km margin -		
	E - H ₂ 119 GBT - Single Tank landing		
	O ₂ - 99 " " " "		
	Auto - then m/d -		
147/23	HGA for TV -		
147/47	A/ Storage		
	More stuff than when TOSTOFF -		
	Going over Storage		
147/54	Water Fila Bag Pinned in		
	Funny -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (206)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
148 -	See previous page on 1.3° rise .1°		
	Brief -		
	Retro - 152 GET		
	• 6.7 fps MCC		
	E.I-3 4 fps MCC		
	177 - $\ell > 1$ fps		
	Present - 6.93		
	GETSPLASH - 192 + 04 - 19		
	<u>FIDO</u> - Sln - -6.9x		
	152:30 enough vector -		
	Gimbal Angles for Water Dump -		
	May skip -		
	<u>MCC</u> - Wrap up canisters in poly, peak		
	bags & tape as required -		
	<u>GUID</u> - waiting for P23		
	<u>GNC</u> - 183 fps DAP -		
	110 SCS -		
	<u>EGCOM</u> - Good Shape -		
	- TCE plot -		
	H&A - annu D & Reacq.		
	Then ask what to do for sleep -		

FLIGHT DIR MISSION LOG	DAY	REV	PG (207)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<p><u>Surgeon</u> - Earlier readings were missed - 430 milli Röntgens - 10 chest X rays since 4/0.</p>		
148/11	<p>Bottom half - water - still cannot get water down -</p>		
	<p>Bubble of Air in Stomach - won't go to Top & bottom</p>		
149/14	<p><u>MCC</u> Cameras - Wrap - AS LM Camister - Food Empt L-3 - Helmet on Suit under left hand ^{sleep} seat restraint - Helmet in Towardshatch -</p>		
149/17	<p><u>MCC</u> Wrap up Camister in food fuel bags & tape as required</p>		
	<p><u>FAO</u> - 150 GET - 61372</p>		
	<p><u>RCVY</u> - Release all ATZ @ 153 ship and all ATC -</p>		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

140/28

A1 - Switch position - checked it
- but he was up on the restraint

harnesses & thought the procedure

was OK. He thought the switch

was OK by looking at it - It was

viewing angle on the switch -

Steerable out -

Questions from SPAN -

Steerable Ant Questions -

Rev 13 -

①

Good locks when came on
down -

Heard it tracking -

Then somewhere, lose

lock -

Tried to tune it up manually

1 minute -

Could not do -

Went on mis -

209

SITE/ACQ/LDS

FLIGHT EVENTS/HISTORY/BRIEFING

after ϕ , went DV64

(2) Stop - pitch 90 yaw 0 - purged
in CS -
3 Times -
2 in P52

(3) Auto Mode

Came around in annis -
after POSKun report,
got HSA lock -
Had good one - good HSK
at beginning of pass -

Water -

(1) Gas in LM water - first try -
got less out less -
Still ~~some~~ some gas in
LM tanks at end -

(2) First purge on Cape Seismic
had gas in -
lot of air in it -

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

VHFA - Came right on after switching
 (1) from B -
 Tried Duplex for ranging
 & it worked.

Forward then aft -

on ASC page after stopping -

Hassenger more than PLMS -

A/

late error needles when zero - had some
 notes -

Maybe used a little more fuel -

with zero slc notes

yaw - 3 Bought

pitch - 2 down

Roll - 2

MSC - Still had load in radar on
 at 60K -

A/ Tape Meter started to drive -
 set labor higher than expected

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
A1	Angles Replanned - V64 good -		
	34-36 signal strength would require, 43, 44 on meter.		
	Can time in manually easy from		
	34/36,		
	407 - Strayed zones - did not		
	go to 10K - Apollo 9 program problem		
	149/23 Water on Fwd Hatch -		
	Wiping it up at intervals		
	WAP-10 - 200K miles		
	<u>Music from crew:</u>		
	149/93 A1 what what is?		
	rll Page 6 1-in for numbers		

FLIGHT DIR MISSION LOG	DAY	REV	PG (214)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
150	A1 CMRCS —		
	5C 4.90		
	5D 4.48		
	6A 4.50		
	6D 4.80		
	6C 4.40		
	6B 4.70		
150	FC-plan —		
	TBE 920°		
	40 hrs		
	Cycle against 165 from here —		
150/10	→ FC ⁰¹ back on line —		
	waiting for 1 st news —		
150/25	A1 - Hmms Coyk Trak —		
	MCC - good		
26 -	A1		
	Tan - Brown —		
	colors have not changed out this far —		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
150/28	Water Dump - 153:30		
	P23 calib		
151	Auto P23 work -		
151/34	F100 LMK - MSFN Vector 15.5		
	Trust Mark - 71440 -		
	1050		
	637		
	583		
	5) 141		
	76		
151/50	A1		
	Falconer then 5/Horizon		
	MVS SA -		
	WASTE H ₂ O DUMPED		
157/56	PL#1 421		
	offline -		
151/59	TV still mode		

FD

APOLLO 10

May 24, 1969

GET: 152:00

ELECTRONIC SYSTEMS

All systems performance nominal. Good High Bit Rate PCM data is being obtained with the Omni Antenna when receiving with the Goldstone 210 foot antenna.

MSFN COMMUNICATIONS

Communication system performance is nominal.

GUIDANCE AND CONTROL

Systems are normal. IMU accelerometer biases, temperatures, and voltages are stable. Accomplished P23 Midcourse Navigation on Star, Lunar Landmarks.

CREW SYSTEMS

No change.

THERMAL

All temperatures are normal.

PROPULSION AND POWER

SPS - normal; no change.

RCS - normal; no change.

Fuel Cell- F/C #2 and #3 - performance normal.
F/C #1 Heatup cycle #3 completed at GET 151:56.
T-Skin = 421°F.

Cryogenic- O₂ remaining - 334#; H₂ remaining - 24.2#.
Heater configuration - unchanged.
Performance is nominal.

Batteries - Batt. A AH₀ 0.0 , AH remaining 40.00*
Batt. B AH₀ 6.26, AH remaining 33.74
Batt. C AH₀ 1.3 , AH remaining 38.7
Total Amp-Hours remaining 112.44


* Batt. A charge is continuing. According to our estimates, Batt. A has been charged to capacity. SSR estimate for amp-hrs remaining at beginning of charge was approximately 1.5 A-H less than our figures indicated.

Sidney C. Jones
153117

F/C #2 TCE CYCLING

(See attached curve)

1. Radiator T's on F/C #2 and #3 are constant ===== constant heat rejection.
2. Fuel Cell loads on F/C #2 and #3 are the same and essentially constant.
3. Fuel Cell #3 reflects these constant conditions with constant Tce and secondary regenerator bypass valve position.
4. F/C #2's Tce and % bypass are cycling.
5. The cycling of the valve and the Tce are working against one another because:
 - a. At point 1, the Tce is out of regulation at 166.7°F due to being restricted in travel at the low by-pass end, and this tells the bypass valve to head toward 100% bypass to lower Tce.
 - b. The bypass valve does this as shown by point 2 but it over-shoots, such that Tce drops out of regulation on the low side approximately 152.6°F.
 - c. The low Tce now tells the bypass valve to move toward 0% bypass (100% regeneration) to raise Tce which it does as indicated between points 2 and 3.
 - d. Again the valve over-shoots sending Tce out of limits on the high side again.
 - e. The cycle continues at decreasing amplitude until the oscillations are damped out.
6. Since F/C #3 parameters are practically identical to those of F/C #2 except for the Tce and by-pass valve operation it can be assumed that the problem is peculiar to F/C #2 and does not result from a unique combination of parameters.

FLIGHT DIR MISSION LOG	DAY	REV	PG (212)
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		
152/30	\$ Meal report - DEKE is hungry - Mileage report		
152/27	GO for TV -		
	FIDO - 180 Vacuum pencil First great by update -		
★	Should find out about this		
	TVPASS -		
★	FIDO - Thinks he might have missed an enter - Caused an incident  unknown site coords to be picked up fused - More to come on this		
153/37	See SPAN Report from me on FC's -		

FLIGHT DIR MISSION LOG

DAY

REV

PG

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

FLIGHT DIR MISSION LOG	DAY	REV	PG 213
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
★	M.I.T. - Tell Pete that he should		
	prepare a complete set of numbers		
	& facts for the press conference		
	for entry of - They always seem to		
	know all kinds of times, altitudes		
	etc - I'd put off all questions		
	subject on that for his press conference -		
	11:52		
	1.2 hrs MCC @ 177		
	11:52 - local -		
	192:03		
<u>153/45</u>	Heads to south - RTC		
<u>153/47</u>	Should we do any thing special about		
★	Turning tunnel near to sun?		
	The usual - SPAN - has problem		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Crew has now detected ice up there in		
	batch crew.		
	Some should consider whether		
	anything needs be done -		
	Gave subject to Neil Hutchinson		
	in SPAN -		
153/58	Told crew they could sleep in -		
153/58	all us when possible		
	A/C - Conister change -		
153/59	Ammi 15 - we'll protect		
	Temp BAT A -		
	Optics power off -		
	Cups empty Heaters		
	O ₂ #1 off #2 auto		
	H ₂ #1 auto		
	H ₂ #2 off		
	Fans - off		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

154/02

Using Exerciser after TBI -
Working fine -

RAD

Present 440 milli rads -

10 chest X-rays -

Considerably above in 8 whole flight
190 milli rad

Thin belts - geometry ~~the~~
different than Apollo 8 -

LiThin Hydroxide crystals -

Local pulmonary irritation -

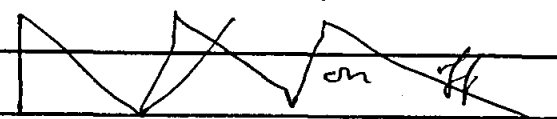
154/10

MCC P27 - Clrb - V66 OK

154/21

^{MCC} Rates renewed -

Compensated in roll rate

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	MILF		
	① FC#2 STABLE - ✓		
	② PTC just being setup - ✓		
	③ SPAN THERMAL CONSIDERING COOL HATCH AREA AND ANY POSSIBLE HEATING ✓		
	④ DO RESEARCH ON P23 - IT DID NOT TURN OUT AS WELL AS EXPECTED. FIRST MARK MAY HAVE BEEN ON WRONG LOCATION BECAUSE OF FAILURE TO OPEN GATE. SHOULD BE REVIEWED -		
	Sleep -		
	⑤ MLL 102 fps ✓ EI - 15 hours -		
	⑥ POTE SHOULD GET ENTRY NUMBERS.		
	⑦ FC#1 on line again at 104		
	TKIN 		

FLIGHT DIR MISSION LOG	DAY	REV	PG <u>215</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	EMS - OK -		
	RETRO - 1.3 fps to get -6.5 - 6.95° now with out Mcc		
	FIDO - Water Dump -		
	GNC - looking @ PTC		
	Sleep late tomorrow		
	Recovery released Atlantic forces		
	ECON -		
	omni's - expect ? 7% HBR 50-60%		
	Will Charge B tomorrow		
	Should not have to dump any more water down to 8%		
	F/C - 2 - stabilized now small cycle every 5-6 mins had done several purges		
	TCE - fluctuates due to over modulation		
	Rad in temp - @ 154+50 - 114/110		
	F/C 1 - has put out 65 ah since pump failure - 35ah left		

CSM CONSUMABLES STATUS

GET 154

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>130</u>	<u>179</u>	<u>171</u>	<u>179</u>
FLT PLN MARGIN	<u>24</u>	<u>67</u>	<u>55</u>	<u>68</u>
PHASE REDLINE (TE)	<u>26</u>	<u>30</u>	<u>35</u>	<u>33</u>
RNDZ REDLINE				
ΔV CAPABILITY	DAP <u>183</u>		SCS <u>110</u>	

SPS

TOTAL Wpu 2387 LBS/ 6 %
 ΔV CAPABILITY DOCKED — fps UNDOCKED 997 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 997 fps
 BURN TIME REMAINING 34 SEC

BATTERY STATUS

A 40 Ah B 32.3 Ah C 38.3 Ah

CRYOS

11.6 TOT 110.6
 H₂ 23.3 LBS () SINGLE TANK LIFETIME 223 GET 223
 PRESENT AVERAGE USE RATE .19 LBS/HR
 O₂ 329 LBS () SINGLE TANK LIFETIME 294 GET
 PRESENT AVERAGE USE RATE 1.86 LBS/HR

191458

WATER

POTABLE 103.2 %
 WASTE 7.8 %
 WASTE AT ^{100%} ~~85%~~ AT 193 GET
 NEXT DUMP AT _____ GET

FLIGHT DIR MISSION LOG	DAY	REV	PG <u>216</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	<p>Surgeon - Crew fine except for fiber-glass - slept 4 hrs last time $\approx 10H$ - being stowed in L3 Started using o/b exerciser</p>		
	<p>$\frac{1}{2}$ Rad per man -- LMP + CDR plugged in -</p>		
155+12	<p>- P-23 Story - PT Final enter did not get in (Crew on THE DISKY MAL?) when loading last line of data in Landmark - Check list Procedure is OK - ^{AND WAS DONE OK} W - Matrix is OK Crew should be briefed</p>		
155+20	<p>PTC is looking good - ie Converging</p>		
156+18	<p>- No one asleep - yet</p>		
156+21	<p>LMP now unplugged</p>		
	<p>EIDO - cut off data @ 163 GET to compute EI - 30 hrs MCC done when $\Delta V > .5$ fps</p>		
	<p>Descent Stage 203 x 10.8 Hard @ 300 GET has no staging ΔV in model Was 190 x 12.6 - @ 112 GET</p>		
	<p>Ascent - 375 GET - still going away - about 900,000 ft</p>		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			217
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
156+28	- CSM - now		} No MCC ₆
	$\gamma_{EI} = -6.95, \vee_{EI} 36315$		
	1504's, 164° 41' W		
	Not Now in up control (with MCC ₆)		
156+50	Antenna Commanding OK - about 65% HBR		
156+50	CMP Just went to sleep - only one plugged in		
	80nm pad on up control		
158+32	- 61% HBR		
158+34	CMP still sound asleep -		
158+50	PTC LOOKS ABSOLUTELY GREAT!		
	EECOM WORKING ON PLAN TO PURGE F/c 1 after next on cycle when it should be full of water		
	I _{xx} - 55K I _{yy} 515K - TLC		
	I _{xx} 15K I _{yy} 50K - TEC		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

NO SWEAT ON WATER + ICE AROUND
HATCH AREA - TOLD SPAN NO REQ^{mt} FOR
NEW PTC ATTITUDE

With No MCC

$$\gamma_{E1} = -6.85$$

however is in up control

MCC₆ $\Delta V = 1.2$ fps to $164^{\circ} 41' W$
No up control 15⁰⁰+04's

161+04

MCC₆ 4 Quads = 2.5 sec turn time
2 Quads = 5.0 sec turn time

Accepted Plan

MCC₆ $\gamma = 1.2$ fps 2 Quad approx 5 Sec
land @ $164^{\circ} 41' W$

~~80~~ 80nm pad to avoid up control

EECOM

FLIGHT DIR MISSION LOG	DAY	REV	PG
			219
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
162:40	<u>G+C</u>		
	1. CM RCS holding as before		
	2. PIPA'S & IRIG'S look good		
	3. EMS Check done +GO		
163:49	$\gamma_{EI} = -6.95^\circ$ $VEI = 36315$		
	$\gamma_{EI} = -6.52^\circ$ $VEI = 36315$		
	EECOM.		
	1. HGA + OMNI D		
	↑ Reacs, Narrow + HGA		
	P +30 Y +270 Settings		
	2. H ₂ tank 1 Auto O ₂ TK1 OFF		
	" " 2 OFF O ₂ TK2 Auto		
	Heater →		
	- 3. Charge Bat B		
	4. FC1 ON LINE @ 165 hours		
	No H ₂ Purge		
	5. FC1 On Line for Redundant		
	Component check		
164:26	Now setup for HGA/OMNI D		
164:31	Bring FC1 ON line - both buses.		
	Plan on redundant component		
	check at about 165:30		
164:40	Uplinked a state vector		

CSM CONSUMABLES STATUS

GET 162+00

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>133</u>	<u>184</u>	<u>171</u>	<u>125</u>
FLT PLN MARGIN	<u>29</u>	<u>75</u>	<u>57</u>	<u>68</u> (18% 229#)
PHASE REDLINE ()	_____	_____	_____	_____
RNDZ REDLINE	_____	_____	_____	_____
ΔV CAPABILITY DAP	<u>196</u>	SCS	<u>113</u>	

SPS

TOTAL Wpu 2436 LBS/ 6.1 %
 ΔV CAPABILITY DOCKED _____ fps UNDOCKED 1020 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 1020 fps
 BURN TIME REMAINING 35 SEC

BATTERY STATUS

A 39.5 Ah B 31.8 Ah C 38.3 Ah 109.6
 NEXT CHG.
164+30

CRYOS

H₂ 24.66 LBS (+2.88) SINGLE TANK LIFETIME 216 GET 70 AMP
 PRESENT AVERAGE USE RATE 0.171 LBS/HR
 O₂ 315 LBS (+27.7) SINGLE TANK LIFETIME 241 GET 70 AMP
 PRESENT AVERAGE USE RATE 1.86 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 32.3 %
 WASTE AT 85% AT 189 GET
 NEXT DUMP AT NONE GET


S BAND REFLECTIVITY TEST

See pg 3-19A (FLT PLAN)

FLIGHT PLAN UPDATE	
TIME	ITEM ✓
168:00	HIGAIN ANTENNA TEST
	ANGLES TO ACQUIRE
	R 11
	P 196
	Y 337
	ANTENNA ANGLES
	P -10
	Y 300
TEST	ANTENNA
1	R 27 P -10
	P 196 Y 340
	Y 298
2	R 65 P -20
	P 196 Y 350
	Y 298
3	R 90 P -30
	P 196 Y 360
	Y 306

SENT TO FAO 162:29

FLIGHT DIR MISSION LOG	DAY	REV	PG 220
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
164:50	A10 doing P37's - look very good. AV MCCG = 1.3 f/s and grid solution's = 1.2 f/s		
	Gd A is disable - GAC has no requirement for this		
	<p>DTO Activities</p> <ol style="list-style-type: none"> SPAN requests that the S/C S-Band reflectivity test be done today. It is scheduled for 168 hrs SPAN requested that a PTC rates of $0.1^\circ/\text{sec}$ be tried. When this was questioned, it developed that Mr. Low was not in favor of doing it. Since there was no operational reason to evaluate this roll rate, the decision was made to NOT do the test. 		
165:10	P52 looked real good		
165:17	Starting P23		
	Do Red. Comp Check after P23		

FLIGHT DIR MISSION LOG	DAY	REV	PG 221
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
165:50	Starting Red Comp. Checks.		
	P23 Evaluation - John says he had no problem tracking stars close to the Terminator.		
166:00	Change H ₂ tank Htr config.		
166:49	Started H ₂ Purge in FC1		
167:09	FC1 SKIN TEMP = 4.33° F		
	<p>What is the minimum angle between the earth horizon and the sun during the P23 activities at 174:30? - Guid. O.</p> <p>Ans <u>60°</u></p>		
167:30	Started Second P-23 series		
167:48	Starting S-Pd Reflectivity Test		
167:56	C+W because of low Press. in H ₂ tank 1. Turn heaters to AUTO in both Tanks.		
167:59	Turn On Fans in both H ₂ tanks		

FLIGHT DIR MISSION LOG	DAY	REV	PG 222
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
168:10	Completed the S-Bd Reflectivity Test see AFD log for results.		
	Need Qd CAD OFF for setting up PTC		
168:20	FIDO bent out of phase because Secondary loop water boiling seems to have messed up Data Selects orbit determination.		
168:48	PTC INITIATED [see later notes] Stowage location of LiOH canister is to be determined by A-10. They were advised of our criteria which was "protect it from damage" and <u>will let us know</u>		
169:04 *	H ₂ tank Htrs - AUTO? , Yes Turn them OFF Tank press up to 266 psj in Tk 2 - started back down after Htrs turned off I suspect Tk 2 Heater was stuck ON with switch in the AUTO position		

FLIGHT DIR MISSION LOG	DAY	REV	PG 223
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
169:50	Take FC1 Off line		
	Terminate H ₂ purge		
	Purge H ₂ and use FC1		
	for MCC 6		
	FC 1 Purge momentarily		
	stuck on - Cycled switch a few		
	times before it started to		
	come down lost HBR at a		
	flow of .16 lbs/hr.		
	H ₂ Tank Heater to AUTO		
	Fan - Off - to test		
	Heater Auto circuit		
*	PTC start was "odd". There		
	was perturbation in pitch + yaw.		
	when the roll was initiated. The		
	data shows no pitch or yaw		
	jets fired and we have no		
	explanation of why the S/C		
	started pitching and yawing.		
	Watch this at the next		
	PTC		

FLIGHT DIR MISSION LOG	DAY	REV	PG <i>224</i>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
170/33			
	171- 35/4 P23		
	174:30 PTC		
	Petro - Event timer - alt kids -		
	F100 - 174 hrs on data -		
	nonrewater dumps -		
	GUID - watching P23		
	GNC - In PTC - Problem setting it		
	P23 alt kids - up -		
	Get ports -		
	SECOM -		
	He Cryo heater Both in Auto -		
	Both have to fail closed or		
	something else -		
	In heater cycle -		
	He Tank #2 has passed		
	upper limit - heaters		
	still on -		
	EO#1 - 50 AH w purge -		
	for GNC-6 - 1 hr		
	before run -		
	CAPCOM -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LDS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Surgeon - Check all people -		
	Feel fine -		
	- CMP of CAR Comstock -		
	before sleep -		
	Procedures - AFP -		
	FAO - Send set document -		
	- it wants some thing else to do		
	do no cover sunburn		

FLIGHT DIR MISSION LOG	DAY	REV	PG 225
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
170/41 A1 -	Rats - should have REC off - MCC - yes had it off Ego to 823		
	H2		
170/55	MCC, H2 Cyo heaters off - Struck in auto Verify Cyo trans off - O2 / Trans off in O2 - Heaters AUTO in #1, O2 #2 off -		
171/01	Weather Report - Clear lake - cloudy P52 - All 3 showed - showing green edge -		
	P23 -		
	Current 4.9 m		
	MSIN best estimate, 15		
	Not designed for no comm - minimum Sun elevation -		
171/57 -	V79 for EOCOP dump		

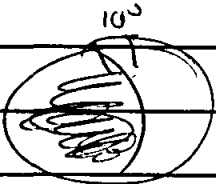
20-23

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
172/06	Tskin = 434° on FC#1		
	H ₂ purge activity on FC#1.		
172/17	PTC rate good		
172/20	Documentary every 40.5 hours -		
172/30	TV - Bring up the lines -		
172/42	LSM 16mm camera failed - free changed		
	Using 75mm lens in CSM,		
	works on LM 16mm camera		
	LMP - Little frustrated.		
172/55	News Report		
	Cryo Klon -		
173/03	Leave H ₂ heater off -		
	we will put one fan on overnight		
	CC - Checklist items -		
	FC#1 valve & FC#2		
	Reserve psi swap -		
	if needed on main chutes, close		
	back pressure valves.		

FLIGHT DIR MISSION LOG	DAY	REV	PG 226
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
173/19	Will have H6A @ 173/25		
	Go for coln TV -		
173/20	- 6010/- 60 on ET100 Pump -		
173/30	208, 966 mini shore run		
	405, 885 earth -		
	7530 Velocity / earth -		
173/40	FC#1 - No more online -		
	EMUD - 60 -		
	ENTRY checklist -		
	✓ FC#1 via FC#2 off -		
	✓ Reserve the Eng -		
	Anywhere you like -		
	2 hours 3-4-5 hours -		
	log in ⁵ 3 minutes -		
	✓ Close back pressure valves on		
	mains if con -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	Bring FC ^{#1} online for MCC		
	Keep it alive -		
	I had misunderstood earlier		
	repts - need to bring FC ^{#1}		
	or more time in order to keep it alive -		
174/10	P23 work		
	Correction Again -		
	with no further use of FC ^{#1}		
	we will reach 370° at ~ 188:30.		
	This is close to the limit for solidifying		
	the K ₀ #. Separation is at 191:30.		
	So we can look at this tomorrow after workup		
	To see if we want to keep put it alive		
	again.		

EVENT	GET	LOCAL (CDT)	REENTRY ELAPSED TIME	ALTITUDE
Mcc 6	177:20:00	~9:30 PM. SUN.	~ - 15 hrs	96,700 ^{statute} 84,060 M
Mcc 7 (O ΔV)	188:48:00	8:37 AM MON.	~ - 3 hrs	29,700 25,800
HORIZON CHECK	191:32:00	10:20 AM	- 17:00 min	2,880 2,500
CM/SM SEP	191:33:00	11:22 AM	~ - 15:00	2,475 2,150
EI (HOOK')	191:48:56	11:37:57 AM	00:00	77 67
BEGIN BLACKOUT	191:49:14	11:38:15	00:18	63 55
.05g	191:49:24	11:38:25	00:28	59 51
END BLACKOUT	191:52:25	11:41:26	03:29	23.3 KFT
DROGUES	191:57:13	11:46:14	08:17	10.5 KFT
MAINS	191:58:01	11:47:02	09:05	
LANDING	192:02:58	11:51:59	14:02	

FLIGHT DIR MISSION LOG	DAY	REV	PG 227
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
174/19	GVID-P23 work -		
	zero perage - 15M5FW		
174/42	P37		
	5 fps -		
	3.7 fps or precision		
174/51	These P23 sightings are not		
	designed for accuracy. The stars are		
	about 80° out of plane and the height		
	there is close to terminator within 10°		
			
	So they are designed to test the limits		
	of the optical system instead of the		
	accuracy for crater content -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
175/05	MCHW 175:30 H ₂ tank		
	Just reset-		
175/06	F100 - Does not believe new data -		
	Going with old vector key as all		
	That disturbance -		
	Present data shows 8 mile		
	Vacuum freeze - old data was 15.		
175/23	MCC-6 pad		
	1 hrs to right =		
	Nominal water dumps -		

GLYNN LUNNEY

MEMO

TO: Mr. Low

FROM: R. J. Ward

SUBJECT: Status of Apollo 10 Test Objectives as of 5/25/69

All Apollo 10 Test Objectives were accomplished except for the following:

1. Communications Relay Tests
 - a) LM Relay
 - b) CSM Relay
 - c) Ground Configuration for MSFN Relay
2. Transearth Thermal control at 0.1°/sec Roll Rate.

The following significant data were obtained as scheduled in the Flight Plan or as additional real-time tests:

1. Color TV - Translunar, Lunar Orbit and Transearth
2. CSM Hi Gain Antenna Auto Reaq Test Translunar
3. CSM Hi Gain Antenna Auto Reaq/OMNI D Test Transearth
4. Post APS Depletion Burn Tests
 - a) Check of PGNCS Calculated Vg after APS Cut-off
 - b) AGS Wide Dead Band (+5°) attitude Hold for 1 hour
 - c) AGS Min Dead Band (+.3°) attitude Hold for 1/2 hour
 - d) PGNCS Wide Dead Band (+5°) attitude Hold for 1 hour
 - e) PGNCS Min Dead Band (+.5°) attitude Hold for 1 hour
 - f) Auto PGNCS Maneuver to New Set of Gimbal Angles 5° different at 1/2° per sec with Light LM Ascent Stage
 - g) PQMD accuracy RCS System A 2 Jet Ullage Using External ΔV in PGNCS, 28 Sec Ullage, then shut down
 - h) PQMD accuracy RCS System A 2 Jet Ullage to depletion, Fuel then Oxidizer. Shut down when Oxidizer Pressure was <100 psi
 - i) RCS System B PGNCS Control Isolating all System A thrusters in the DAP
5. P23 Midcourse Navigation - Star/Earth Horizon Transearth Four Series Sightings Starting at 165 Hours GET about 3 hours apart. Three Stars each time, 3 Marks per star.

5. Photography - Descent Strips, Stereo Strips, Obliques and Terminator to terminator Sequences.

In summary Apollo 10 completed about 98% of all required DT0's (98.25 to be exact) plus about 12% extra for significant data above that required. Total 110% (CSM 106+LM 4). There are no more objectives scheduled before splashdown.


Robert J. Ward

RJW/ggg

FLIGHT DIR MISSION LOG	DAY	REV	PG 228
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
175	New SV Target, V66 -		
175/31	Uplink Complete -		
175/36	R/ His P37 good - Reto on his SV		
	Egot some answer -		
	E/ Let H ₂ ground down		
	229.3 #1 tank		
	Will put jam on frnt - 5 ps./hour -		
176/10 -	Going to P30 -		
	MCC-6		
176/39	Scrubbed MCC-6		
176/50	A/ - Run P37 @ 198:30 w present		
	vector -		

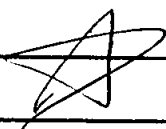
SITE/ACQ/LOS

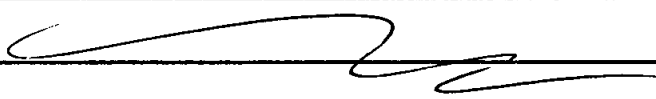
FLIGHT EVENTS/HISTORY/BRIEFING

at 176:39, Bruce summarized the story for the crew.

The situation is

- 1) The experts think the residuals have not settled down quickly enough after the surge of ~~changing~~ boiling disturbance
- 2) They therefore suspect, with reasonable probability, that a MCC-7 is required
- 3) Therefore, the best preparation for MCC-7 is to ship MCC-6 with and is turned tracking from 170 to ~ 185 W MCC 7 @ 188:30.
- 4) Bruce told crew we were still in

FLIGHT DIR MISSION LOG	DAY	REV	PG <u>229</u>
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	corridor, but correcting to the middle		
	of the corridor.		
	P37 comparison -		
	$\gamma = -6.8$		
	Bill Stroble came in & said you could see 106 out there - IT was Jupiter -		
177/11	CMRC	5C	5.1
		P	5.1
		6B	5.1
		B	5.1
		6C	4.0
		6D	4.6
	No hunting -		
177/13	Or surge 2 & 3.		
177/16	Crew Wants up @ 185 hrs -		

FLIGHT DIR MISSION LOG	DAY	REV	PG
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
177/17	H ₂ fuel #1 on -		
	10 hours JB MCHW -		
	O ₂ HTU #2 auto -		
★	Wake crew up at 185 GFT		
			
177/21	CK40 Config - All Check OK -		
	all off except		
	H ₂ fuel #1 on -		
	O ₂ HTU #2 auto		
177/33	Crew Status Report -		
	Going to sleep -		

FLIGHT DIR MISSION LOG	DAY	REV	PG 230
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	GNC - CM RCS 4.0 min		
	PTC - looks OK - Just started		
	EECOM - F/c 1 - back on line - 3 hr purge		
	H ₂ flow rates took long time to		
	drop off maybe 50 #h available		
	Just terminated Batt B charge -		
	no more required -		
	MC+W - probable Motor failure		
	in H ₂ - operating with		
	1 fan - manual		
	O ₂ tank 2 ^{Heater} in Auto		
	F/c 2+3 doing OK.		
	177+49 - A-10 last Comm check		
	- Traj still trying to recover from FC purge		
	Crew Status OK. still below .5 RAD		
	Retro happy with Stowage		
	Recovery - Wx7 Comm look good		
	expect 4' Seas - will use TILUE		

FLIGHT DIR MISSION LOG

DAY

REV

PG

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

CSM CONSUMABLES STATUS

GET 177+30

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>137</u>	<u>176</u>	<u>164</u>	<u>170</u>
FLT PLN MARGIN	<u>43</u>	<u>78</u>	<u>62</u>	<u>76</u>
PHASE REDLINE (TE)	<u>18</u>	<u>22</u>	<u>27</u>	<u>25</u>
RNDZ REDLINE	<u> </u>	<u> </u>	<u> </u>	<u> </u>
ΔV CAPABILITY	DAP <u>196</u>	SCS <u>113</u>		

SPS

TOTAL Wpu 2436 LBS/ 6.1 %
 ΔV CAPABILITY DOCKED — fps UNDOCKED 1020 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 1020 fps
 BURN TIME REMAINING 35 SEC

BATTERY STATUS

A 38.7 Ah B 38.2 Ah C 38.3 Ah
 TOT 115.2

CRYOS

H₂ 16.26 LBS () SINGLE TANK LIFETIME 228 GET ~~828~~
 PRESENT AVERAGE USE RATE .205 LBS/HR
 O₂ 2913 LBS () SINGLE TANK LIFETIME 298 GET
 PRESENT AVERAGE USE RATE 1.84 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 57.1 %
 WASTE AT ¹⁰⁰85% AT 193+47 GET
 NEXT DUMP AT GET

APOLLO 10 MISSION

Eighth Report

(144 through 168 hours)

The mission has progressed satisfactorily during this period. The crew performance continues to be satisfactory, with major activities being midcourse navigation, star/landmark sightings, two television transmissions, and periods of passive thermal control. System performance continues to be good, with only minor problems which have had no significant effect on the mission. The first transearth midcourse correction was cancelled because the trajectory conditions were nearly perfect.

Entry interface, as of 168 hours, will be at 191:48:55 at a velocity of 36 315 ft/sec and a flight-path angle of minus 6.5 degrees. The earth-referenced trajectory conditions at 168 hours were 5751 ft/sec in velocity, minus 80.42 degrees in flight-path angle, and 127 600 nautical miles in altitude.

The two television transmissions during this period were at 147 hours 24 minutes and 152 hours 30 minutes. The duration of these transmissions was 10 minutes and 28 minutes, with very good picture quality obtained during both periods.

Fuel cell 1, which has a failed cooling pump circuit, has been placed on the bus twice during this period. An effective purging cycle was initiated while the fuel cell was on the bus the second time. The fuel cell is available for load sharing, if required.

The consumables usage continues to remain at or below predicted levels, and temperatures continue within predicted limits.

Donald D. Arabian
Donald D. Arabian
Evaluation Manager

APOLLO 10 MISSION PROBLEM LIST

May 25, 1969

AP

ITEM NO.	VEHIC		DESCRIPTION	ACTION PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
1	X		Command module reaction control system A helium manifold pressure decay	Tests indicate no degradation due to shock from 50 to 300 psig for leak in tubing. ASHUR for postflight testing.	Ferguson NR		
2	X		Fuel cell 1 oxygen flowmeter failed	Caution and warning was affected when switching selector from fuel cell 2 to fuel cell 1. There is no constant caution and warning. Waiver 185 at Downey. Change effective on CSM 110 to deactivate oxygen low flow completely. Will decide Tuesday whether to submit ASHUR for command module wiring check.	Ferguson Kingsley		
3	X		Command module reaction control system B helium manifold pressure abruptly dropped from 44 to 37 psi when propellant isolation valves opened	Burst disc on oxidizer system ruptured. Verify servicing procedures, in work. Investigate cause of disc failures. Inspect system for specification metallurgical properties. How to prevent causing in future. ASHUR for postflight analysis.	Ferguson NR		
4	X		Suit loop water separator breakthrough; change in wick wetting technique was successful	Inspect and test separators. TCN contains new servicing procedures: 1. Basically leaves wick wetter after altitude chamber (2 lb residual) 2. Determine breakthrough point; if passes 2.6 psi, will go to 4. NR will review procedure to check breakthrough over 2.6 psi.	Tucker NR		
5	X		Primary environmental control system evaporator dried out Switched to secondary evaporator at 0:15:00. Primary evaporator reser- viced at 73:15:00, dried out again.	Dryout also occurred during altitude chamber run ASHUR for postflight testing.	Tucker NR		

APOLLO 10 MISSION PROBLEM LIST

ITEM NO.	VEHICLE		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
6	X		Thin white line on right hand side window (top to bottom)	Await postflight debriefing. Look at windows postflight.	Wade NR		
7	X		Crew reported high frequency vibration prior to completion of S-IVB translunar injection firing	Data from spacecraft show about 16 Hz, 0.1g peak-to-peak. Rates show 0.4 Hz, 0.1 deg/sec. No significant vibration. Discuss at crew debriefing.	Wade	CLOSED	
8	X		High oxygen flow caution and warning during translunar injection firing. Cabin oxygen regulators operated at same time	Caused by combined flow of cabin purge and make-up oxygen by the cabin pressure regulator.	Hurt	CLOSED	
9	X		Carbon dioxide partial pressure readings 1.2 mm Hg; should be lower	Lithium hydroxide canister being returned; ASHUR for analysis at Pratt & Whitney.	Gillen		
10	X		Program alarm 122 occurred while or immediately after the crew was observing the earth through optics	Inadvertently hit MARK button while playing around with impulse controller (crewman in tunnel at the time).	Hanaway	CLOSED	
11	X		Environmental control system oxygen manifold pressure dropped to 75 psi (should be 100) for about 3 seconds during redundancy checks	NR will submit Apollo Operations Handbook change (verify pressure drops and causes oxygen high flow warning and returns to normal flow). Test Change Notice to test 107 and subsequent.	NR Libby		
12	X		WATER PROBLEMS Water/gas separator did not operate satisfactorily Air in initial serviced potable water	Redesign of bag; test in zero-g airplane June 12. Tucker to check what servicing procedure used. ASHUR for tank bladder permeability test.	NR McAllister		
13	X		Digital event timer on panel 1 jumped 2 minutes while counting down to first midcourse correction	First time minutes jumped. Circuit study and test in progress. Screening plan for 107 available. NR to identify possible causes by Tuesday. ASHUR for postflight testing.	Lattier NR		

APOLLO 10 MISSION PROBLEM LIST

ITEM NO.	VEHICLE		DESCRIPTION	ACTION IN PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
14	X		Thermal coating on forward hatch flaked off during lunar module cabin pressurization	Remove TG-15000; replace with aluminumized Mylar, thermal paint, or nothing. Visually inspect hatch. Fix: replace insulation with Mylar tape. Take to CCB Wednesday.	NR Smith		
15	X		Tunnel would not vent	Test venting assembly per ASHUR	Hurt NR		
16	X		Simplex-A not operating; operated properly later	No action, pending crew debriefing	Kingsley		
17	X		No down-voice from command and service module	Ground problem; Goldstone was receiving down-voice. Problem corrected at 98:39:00.	Kyle	CLOSED	
18	X		Transponder in command module had to be cycled to get rendezvous radar tracking	Hold ASHUR to inspect switch and wiring until crew debriefing	Kingsley NR		
19	X		Lunar module camera failures	Hasselblad failure is within camera. Film pack and batteries OK. Sequence camera failure due to alignment of one film cartridge. Camera operated properly later. ASHUR required.	Abbey Lobb		
20	X		AC circuit breaker to fuel cell 1 open; reset gave undervoltage indication Fuel cell open-circuited at 121:16. Short in glycol pump, hydrogen pump, pH sensor, or associated wiring.	Identify possible causes based on history. Check spacecraft wiring per ASHUR.	Kingsley NR		
21	X		Condenser exit temperature on fuel cell 2 fluctuating and triggered caution and warning several times	Hydrogen purge attempted to stabilize exit temperature. Conduct thermal dynamic analysis of the loop and assess the effect on 107. Is there any detrimental effect?	NR Ferguson		

APOLLO 10 MISSION PROBLEM LIST

May 25, 1969

ITEM NO.	VEHICLE		DESCRIPTION	ACT PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME	
	CSM	LM						
1	85:10:00	X	Crew reported that the lunar module potable water contained air through-use	Review deaeration procedures and servicing procedures. Test Change Notice if required.	Gillen GAEC		6/2/69	
2		X	Noise in cabin a. S-band antenna movement noise b. Glycol pump noise bad c. Fans	a. Normal, similar to altitude chamber comments (no change anticipated) b. Fix available (flex lines) c. CCB action required	GAEC			
3	82:20:00	X	Abort guidance system deadband switch indicated max. on telemetry when in min. position	This is normal for circuit breaker open. Worked correctly after system powered up.		CLOSED		
4		X	Instrumentation discrepancies		GAEC/Hurt	CLOSED		
			a. Glycol temperature read zero during first manning; later normal (82:45:00)					
			b. Chamber pressure switches failed on reaction control thrusters--- B3D (97:34), B4U (98:31)	b. Similar occurrence on LM-3				
			c. Cask temperature read properly prelaunch, read open inflight	c. Cask temperature switched at altitude by barostat. Not checked out at altitude. Action for GAEC to perform checkout. Test Change Notice required.				Small/Packham/GAEC
			d. Reaction control system A manifold pressure went to zero (108:30)	d. System operation was normal.				Kingsley/GAEC
e. Descent propulsion fuel pressure GQ3501 read zero in cabin, telemetry normal		GAEC/Walsh						

APOLLO 10 MISSION PROBLEM LIST

ITEM NO.	VEHICLE		DESCRIPTION	ACTUAL PROCESS	ACTION ASSIGNED TO	STATUS	ESTIMATED COMPLETION TIME
	CSM	LM					
4		X	Instrumentation discrepancies - Continued f. Ascent propulsion oxidizer manifold pressure 187 on telemetry, 180 in cabin; predicted was 170 psi (GP1503) g. Absolute pressure in glycol system not steady	f. Based on accuracies, loading, and temperature variation, condition not abnormal. g. Variation one indication of no air in loop.	GAEC/Walsh		
5		X	Simplex-A not operating at 94:28:00	Recheck of system after docking showed system operating. Analysis of configuration to understand what happened. Corona being considered. Need crew debriefing.	Kingsley/GAEC		
6		X	Backup voice noisy but readable while on omni in revolution 13	Apollo 9 onboard-recorded data tape run through the backup link and comes out noisy but readable. The clipping process in backup voice mode, plus cabin noise, causes the condition.	Kyle/GAEC	CLOSED	
7		X	S-band steerable antenna operation showed drop in signal during part of revolution 13. Attitudes were proper for maintaining lock.	Present analysis indicates antenna was in manual mode (not tracking) Detailed discussion with crew with signal strength traces required.	Kyle/Kingsley/GAEC		After systems debriefing
8		X	Rendezvous radar alarms during first marks, indicating bad inputs to computer a. 101:09:29 - Range rate read minus 9800 ft/sec; should be about 200 ft/sec b. 103:14:24 - Read 9999 ft/sec; should be 295 ft/sec c. 104:37:00 - Read 6722 ft/sec; should be minus 124 ft/sec (no alarm) d. 105:17:00 - Range read 22 n.mi.; should be 40 n.mi. (range rate may also have been in error)	Circuit being analyzed. Could be associated with computer timing between rendezvous radar buffer and input to the computer.	GAEC/Hanaway		

ITEM NO.	VEHICLE		DESCRIPTION	ACTION PROCESS	ACTION ASSIGNED TO	US	ESTIMATED CO	TION
	CSM	LM						
9		X	Abort guidance versus Verb 83 in primary guidance computer local vertical different by 20 deg; no difference after undock	K factor (time register) syncs time between primary and abort guidance, was loaded incorrectly in last two digits; was updated between events; simulation to be run to verify	GAEC/Hanaway		5/29/69	
10		X	Apparent gimbal drive actuator pitch failure; telemetry indicates actuator never moved a. ac transient may be associated; 124 V peak (phasing burn) b. Caution and warning on actuator fail during phasing burn	Roll actuator worked normally. Data analysis in progress. Range tape expected on 5/25/69.	GAEC/Hanaway		5/26/69	
11		X	Large attitude excursions during staging. Abort guidance mode control switch was in "auto" rather than "attitude hold" and apparently in maximum deadband. Manual control overrode. The abort guidance "auto" configuration was attempting to point the lunar module Z-axis at the command module as set in to the abort guidance. Simulation results show what happened is associated with the abort guidance mode switch.	Pilots' line of vision to switch markings and switch position gives false indication of switch position. Review all other switches for similar situation. Establish how to overcome.	GAEC/Hanaway North/Jones		6/2/69	
12		X	During descent propulsion phasing, caution and warning and alarm a. Gimbal warning b. Low level sensor	Await crew debriefing a. See item 10 for action b. Similar to LM-3; bubble passage Verify Apollo Operations Handbook and crew information	GAEC/Kingsley/Gadbois			
13		X	Crew commented that reticle was bad during platform realignment after phasing burn	Await postflight debriefing	Hanaway			Crew debriefing

Flight Director

Apollo Ten Weather Status

prepared 0515Z 26 May 1969

Forecast conditions: PRS & SRS 5

6/10 total cloud cover

1800 scattered, 10000 broken, high broken

10 miles

ESE (120 degs) 12 knots

waves 4 feet 5 sec

81 degs F

widely scattered showers.

carter

The weather recon flown during the afternoon supports this forecast - the recon was just concluded and a more detailed survey of the results will be done between now and 0800Z this morning at which time we will update if necessary.

CC: CAPCOM
Recon

CSM CONSUMABLES STATUS

GET 184+00

316
333/9
64

SM RCS (LBS, USABLE)

QUAD	A	B	C	D
Wpu	<u>134</u>	<u>182</u>	<u>164</u>	<u>169</u>
FLT PLN MARGIN	<u>41</u>	<u>86</u>	<u>60</u>	<u>73 (260)</u>
PHASE REDLINE (51)	<u>130</u>	<u>177</u>	<u>158</u>	<u>164</u>
RNDZ REDLINE				
ΔV CAPABILITY	DAP <u>197</u>	SCS <u>123</u>		

SPS

TOTAL Wpu 2436 LBS/ 6.1 %
 ΔV CAPABILITY DOCKED _____ fps UNDOCKED 1020 fps
 BLOWDOWN ΔV CAPABILITY (UNDOCKED) 1020 fps
 BURN TIME REMAINING 35 SEC

BATTERY STATUS

A 38.5 Ah B 37.4 Ah C 38.3 Ah

CRYOS

H₂ 15.12 LBS (-2.7) SINGLE TANK LIFETIME 215 GET
 PRESENT AVERAGE USE RATE 0.20 LBS/HR
 O₂ 243 LBS (34.6) SINGLE TANK LIFETIME 254 GET 70 AM
 PRESENT AVERAGE USE RATE 1.8 LBS/HR

WATER

POTABLE 102.5 %
 WASTE 83.1 %
 WASTE AT ¹⁰⁰~~85~~ % AT 190.13 GET
 NEXT DUMP AT _____ GET

1
Flight Director

Apollo Ten Weather Status

prepared 0830Z 26 May 1969

Forecast conditions: PRS & SRS 5

6/10 total cloud cover

2000 scattered, high broken

10 miles

ESE 12 knots

waves 4 feet 5 sec

81 Degs F

widely scattered showers with conditions of -
1500 broken high broken 5 miles.

carter

cc; Capcom
Recov

BASED ON RECON DATA

FLIGHT DIR MISSION LOG	DAY	REV	PG (231)
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
LMP			
178+11	178+00 - LMP's as sleep		
182+49	CM/RCS LOOKS LIKE PREHEAT WILL BE		
	REQUIRED		
182+50	PTC GOING FANTASTICALLY WELL -		
	WELL WITHIN 5°		
183+50	RETRO PRESENTLY RECOMMENDING		
	MCC ₇ - ABOUT 1.4		
	Y _{EI} - WITH MCC ₇ = -6.52		
	δ _{EI} WITHOUT MCC ₇ = -6.68		
	TO PETE -		
	① CM RCS ON BORDER FOR PREHEAT		
	② MCC ₇ DECISION SHOULD BE AVAILABLE		
	AT CREW WAKE UP		
	③ CREW WAKE UP @ 185 hrs - SEE POEM		
	④ CREW HAS BEEN BRIEFED ON ENTRY		
	CHANGES - PAGE 226 IN LOG		
	⑤ EECOM SAYS WE SHOULD PUT F/C 1 ON		
	LINE IF PREHEAT REQUIRED -		
	ABOUT 1 HR BEFORE - HOWEVER THIS		
	IS NOT COMPATIBLE WITH CHECKLIST		
	⑥ SEE EECOM TEXT FOR STORY ON CRYO		
	FANS/HEATERS		

SITE/ACQ/LOS

FLIGHT EVENTS/HISTORY/BRIEFING

G+C

1. CM RCS

if necessary to preheat, stick with checklist.

*

Get Temp readout at EI-240

2. SMJC - 340 sec burn

This places the SM on a hyperbolic traj. -

3.

Retro

-W/O MCC7 we are 20 n.mi from upcontrol

EECOM1. O₂ TK 2 Htrs Auto

1 OFF

H₂ Fans - TK1 ON

TK2 OFF

H₂ Htrs - OFF

*

Switch after wake up

Will watch H₂ pressures

2. IF FC 1 is used we will not purge. Need to have it on line 1 1/2 hrs prior to CM RCS preheat

FLIGHT DIR MISSION LOG		DAY	REV	PG
				233
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING			
185	Crew wake up - Reveille!			
185:42	Decided to make MCC7 in order to reduce the max G during entry from 7.5 to 6.5 (approx.)			
186:00	Recovery Briefing			
	15°04'S 164°21'W - Princeton			
	20 @ V10 WH 4' 120/12 KB			
	<10% Showers			
	11°08'S 157°04'W - DD Carpenter			
	20 @			
186:23	TV system is GO			
186:35	Get Crew Dosimeter Readings			
	CUR= CMP= LMP=			
	h = 39000 N.mil			
186:47	Terminated PTC			
186:51	TV			
187:13	Uplink, Stale Vector, Reformat & TGT load			
187:20	No Joy ON VHF Check			

FLIGHT DIR MISSION LOG	DAY	REV	PG
			234
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
187:23	Standby CP ONLINE		
	A10 GO W Beam width on MGA		
187:33	FCI SKIN Temp = 370°F Pred will be at 365° @ 189:10		
	Sunrise = 17:17 GMT (192:28) Civil Twilight = 16:54 GMT		
187:39	Muvr + Entry PADS read up		
188:00	Configured for 2 jet translation		
188:03	Starting Cold Soak		
188:18 (-3:30)	At burn attitude		
	Suit HT XCHGR IN ON position? NO - IT IS NOW!		
188:34	GET time back Good		
188:37	P41		
188:47	Configuration Discrepancies as follows.		

FLIGHT DIR MISSION LOG	DAY	REV	PG
			235
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
	RoT CNT Pwr Direct -ON		
	AH 1 / Rate 2 BMAG		
	AH DB - MIN		
	Rate - LOW		
188:50	Burn ON TIME BT = 6.6 secs, looks real good		
189:03	CMPCS Temp Readings		
	C 5.0	D 4.8	A 5.1 15.1
			4.2 4.9
	DO NOT need to Heat		
	192:03:25 192:02:57 - Landing 191:58:00 - Main 191:57:12 - Progue 191:48:54 - EIU		
189:20	Servicing Pri Evap. Turn Off All Cryo tank Htrs & Fans		
189:24	Went to Manual Full Increase on Steam Press - Pri Evap Service Complete		
189:48	logic check GO FOR PYRO ARM		
189:51	Entry Attitude		

FLIGHT DIR MISSION LOG	DAY	REV	PG 236
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
189:54	Star check good to about .1°		
	Pri Read out decreasing, may want to pull heater cb early to avoid a heater cycle		
190:14	P 52 - looks very good Drift < .015°/hr in all axes $\delta = -6.53^\circ$		
190:16	Step 21 complete 703600 n.mi is total distance s/c has traveled.		
190:29	EMS Check Passed Stopped scribing as A10 was driving stylus to initial set up.		
190:32	Activate Pri Erap GFC suggests backup scroll 1/2" and run forward to 3715 l/w Several times to try to break thru the emulsion This worked & the pen is now scribing		
190:46	Uplinking State Vector		

FLIGHT DIR MISSION LOG	DAY	REV	PG 237
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
190:50	EMS Function switch to "Range Set" - Do NOT need to go to Next Pattern		
190:53	VHF Check GOOD		
191:04	Logic Bus - ON GO for Pyro Arm		
191:05	CM RCS Press - both rings look good 3360 - He TRIP Ring 1 3260 - " " " Ring 2 293 = Mufd Press both rings		
	Secondary Exp looks good		
191:07	Thruster Check both rings look good		
191:34	Sep ON TIME MNA + MNB Volts look good (28v) EMS started at sep GO to Next Non exit pattern		

FLIGHT DIR MISSION LOG	DAY	REV	PG 238
SITE/ACQ/LOS	FLIGHT EVENTS/HISTORY/BRIEFING		
191:38	DSE Running		
191:42	Tracking horizon pitch		
	A10 Thinks EMS will work		
	Battery lifetime = 95 hrs on the table inter		
191:53	AOS - ARIA 8 Princeton Radar Contact		
191:54	Visual at RET 06:00		
191:57	Sonic Boom		
191:59	Visual on Parachutes 3 Chutes		
	Crew in good shape		
192:03:25	A-10 landed 3 to 4 miles from Princeton		