



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

* APOLLO 17

DECEMBER 6 LAUNCH

DO NOT DISCARD
THIS COPY BASELINE FOR
ALL LAUNCH DATES

CHANGE A CSM LAUNCH CHECKLIST

PREPARED BY

FLIGHT PROCEDURES BRANCH
CREW PROCEDURES DIVISION

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

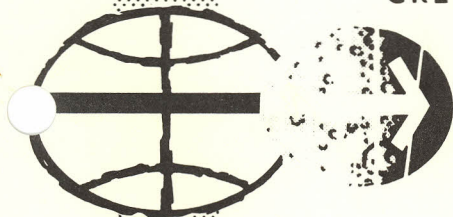
OCTOBER 11, 1972

Parker

LOC 000-446
SIGNATOR Bentley

SUBJECT
PGM APO *
T R

INDEXING DATA
DATE 10-11-72
OPR MSC
00



HSI- 481248

APOLLO 17
CSM LAUNCH CHECKLIST

OCTOBER 11, 1972

PREPARED BY: Dennis L. Bentley
DENNIS L. BENTLEY
BOOK MANAGER

APPROVED BY: Paul C. Kramer
PAUL C. KRAMER, CHIEF
FLIGHT PROCEDURES BRANCH
CREW PROCEDURES DIVISION

It is requested that any organization having comments, questions, or suggestions concerning this document contact Dennis L. Bentley, Flight Procedures Branch, CG42, Building 4, room 256, telephone 483-3291.

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes should be submitted to the Apollo Flight Data File Manager, T. W. Holloway, CG5, Building 4, room 230, telephone 483-4271.

Distribution of this document is controlled by Flight Data File Manager, T. W. Holloway, Flight Planning Branch, Crew Procedures Division.

CSM LAUNCH CHECKLIST

LIST OF EFFECTIVE PAGES

Basic 9/4/72
Change A 10/11/72

PAGE	DATE	PAGE	DATE
*i	10/11/72	2-14	9/4/72
ii	9/4/72	2-15	9/4/72
iii	9/4/72	*2-16	10/11/72
1-1	9/4/72	*2-17	10/11/72
1-2	9/4/72	*2-18	10/11/72
1-3	9/4/72	2-19	9/4/72
1-4	9/4/72	2-20	9/4/72
1-5	9/4/72	*2-21	10/11/72
1-6	9/4/72	*2-22	10/11/72
1-7	9/4/72	2-23	9/4/72
1-8	9/4/72	2-24	9/4/72
1-9	9/4/72	2-25	9/4/72
1-10	9/4/72	2-26	9/4/72
*1-11	10/11/72	*2-27	10/11/72
*1-12	10/11/72	2-28	9/4/72
1-13	9/4/72	*2-29	10/11/72
1-14	9/4/72	2-30	9/4/72
1-15	9/4/72	2-31	9/4/72
2-1	9/4/72	3-1	9/4/72
2-2	9/4/72	3-2	9/4/72
2-3	9/4/72	*3-3	10/11/72
2-4	9/4/72	3-4	9/4/72
2-5	9/4/72	*3-5	10/11/72
2-6	9/4/72	3-6	9/4/72
2-7	9/4/72	*3-7	10/11/72
2-8	9/4/72	4-1	9/4/72
2-9	9/4/72	4-2	9/4/72
*2-10	10/11/72	*4-3	10/11/72
2-10A	9/4/72	*4-4	10/11/72
2-10B	9/4/72	4-5	9/4/72
*2-11	10/11/72	4-6	9/4/72
*2-12	10/11/72	4-7	9/4/72
2-13	9/4/72	4-8	9/4/72

*Current change

LIST OF EFFECTIVE PAGES (CONT)

PAGE	DATE	PAGE	DATE
4-9	9/4/72	6-9	9/4/72
4-10	9/4/72	6-10	9/4/72
4-11	9/4/72	7-1	9/4/72
4-12	9/4/72	7-2	9/4/72
4-13	9/4/72	7-3	9/4/72
4-14	9/4/72	7-4	9/4/72
4-15	9/4/72	7-5	9/4/72
4-16	9/4/72	7-6	9/4/72
5-1	9/4/72	7-7	9/4/72
5-2	9/4/72	7-8	9/4/72
5-3	9/4/72	8-1	9/4/72
5-4	9/4/72	8-2	9/4/72
5-5	9/4/72	8-3	9/4/72
5-6	9/4/72	8-4	9/4/72
5-7	9/4/72	8-5	9/4/72
5-8	9/4/72	8-6	9/4/72
5-9	9/4/72	8-7	9/4/72
5-10	9/4/72	8-8	9/4/72
5-11	9/4/72	8-9	9/4/72
5-12	9/4/72	8-10	9/4/72
6-1	9/4/72	8-11	9/4/72
6-2	9/4/72	9-1	9/4/72
6-3	9/4/72	9-2	9/4/72
6-4	9/4/72	9-3	9/4/72
6-5	9/4/72	9-4	9/4/72
6-6	9/4/72	9-5	9/4/72
6-7	9/4/72	EMER/1-1 . .	(SYS C/L)
6-8	9/4/72	EMER/1-2 . .	(SYS C/L)

+06:15 OMNI ANT - D (AZ < 96°)
- C (AZ > 96°)
+06:45 SIVB to orbit
+07:00 Report Status
+07:41 IECO (1t 5 - on)
+08:00 Report Status
+08:11 PU SHIFT
+08:30 GO/NO GO FOR STAGING - report
+08:36 Level sense arm _____
+09:17 Mode IV - Report
(VI ~ 22,685, H DOT ~ +104,
H ~ +94)

Report Status
+09:20 OECO (1ts on)
+09:21 SII Staging - 1ts out
+09:22 SIVB Ign Cmd - 1t on
+09:24 SIVB 65% - 1t out

+10:00 GO/NO GO FOR ORBIT - report

~10:24

MODE III

MODE IV

INSERTION

+11:00 Report Status
+11:51 SECO (1t on) - report _____
(Begin TB5)

*If LV GUID - CMC: *
* LV STAGE sw - SII/SIVB *
* SECO (1t on, begin TB5)*

*If no SECO (VI +100 fps): *
* THC-CCW & neutral in 1 sec *

+12:01 INSERTION - 1t out (TB5 + 10 sec)

Record VI _____ (fps)
H DOT _____ (fps)
H PAD _____ (.1nm)

KEY RLSE

Record HA _____ (.1nm)
HP _____ (.1nm)
TFF _____ (min-sec)

PRO

DATE 9/4/72

V37E 00E

When CMC ACTY lt out:

V66E

V45E

Verify DAP load, V48: R1 = 31102, R2 = 01111

V46E

CSM WT _____

V83E (check θ)

P TRIM _____

PRO

Y TRIM _____

US LOS
(00:15:44)

SM RCS Control of SIVB (APS module failed)

LV GUID - CMC

MAN ATT (ROLL) - MIN IMP

cb SECS ARM (2) - close

AUTO RCS SEL P&Y - OFF

AUTO RCS SEL A/C ROLL - MNB

AUTO RCS SEL B/D ROLL - MNA

RCS CMD - ON

BSE command BURN MODE ON

If successful: LV GUID - IU

Control PITCH & YAW with THC, ROLL with
RHC

Allow SIVB to drift in PITCH (Gravity
Gradient)

Control YAW within platform limits

Perform normal procedures except:

TB6-15min: Mnvr to R2 Align Att &
set up ORDEAL Pitch = 0°

Hold R2 Align Att until Ignition

Null Ullage deviations with SM RCS

After TLI IGNITION: RCS CMD - OFF

AUTO RCS SEL (16) - MNA/MNB

MAN ATT (3) - RATE CMD

After TLI CUTOFF: LV GUID - CMC

MAN ATT (3) - ACCEL CMD

RCS CMD - ON

DATE 10/11/72

PAN CAMR SELF TEST - off (ctr)
PAN CAMR STEREO - STEREO
PAN CAMR MODE - STBY
PAN CAMR OPR tb - gray
PAN CAMR PWR - BOOST
PAN CAMR V/h OVRD - off (ctr)
UV SPECT - OFF

PANEL 250

cb Panel 250 - all closed except:
cb PYRO A TIE TO BAT BUS A - open
cb PYRO B TIE TO BAT BUS B - open
cb BAT C TO BAT BUS A - open
cb BAT C TO BAT BUS B - open

PANEL 251

WASTE MGMT OVBD DRAIN vlv - OFF

PANEL 252

BAT VENT vlv - VENT
WASTE STOWAGE VENT vlv - VENT

PANEL 275

cb Panel 275 - all closed except:
cb MNA BAT C - open
cb MNB BAT C - open
cb FLT/PL BAT BUS A - open
cb FLT/PL BAT BUS B - open
cb FLT/PL BAT C - open

PANEL 276

cb Panel 276 - all closed

PANEL 277

cb Panel 277 - all open
SPS PRESS FUEL IND - 1
SPS PRESS OXID IND - 1

DATE 10/11/72

PANEL 278

cb Panel 278 - all closed except:
cb UPRT SYS COMPR (2) - open
MAP CAMR/LASER EXP COVERS - ctr
MAP CMR/LASER EXP COVERS tb - gray
IR EXP COVER - ctr
IR EXP COVER tb - gray
UV EXP COVER - ctr
UV EXP COVER tb - gray
SM PWR SOURCE - FC2 (guarded)
02 TK 3 ISOL vlv - (ctr)(OPEN*)
02 TK 3 ISOL vlv tb - gray

PANEL 300

RH SUIT FLOW vlv - FULL FLOW

PANEL 301

LH SUIT FLOW vlv - FULL FLOW

PANEL 302

CTR SUIT FLOW vlv - FULL FLOW

PANEL 303

PRIM CAB TEMP vlv - COLD (CW)
SEC CAB TEMP vlv - COOL-MAX (CW)

PANEL 304

DRNK H2O SUPPLY vlv - OFF (CW)

PANEL 305

FOOD PREP COLD H2O vlv - rel
FOOD PREP HOT H2O vlv - rel

DATE 10/11/72

INSERTION AND SYSTEMS CHECKS

INSERTION & SYS CK

- 1 GMBL MTRS (4) - OFF (LMP confirm)
 TVC SERVO PWR (2) - OFF
 SECS PYRO ARM (2) - SAFE
 SECS LOGIC (2) - OFF
 cb SECS ARM (2) - open
 cb DIRECT ULLAGE (2) - open
 cb ELS/CM-SM SEP (2) - open (verify)
 cb FLT/PL VENT - open
 MN BUS TIE (2) - OFF(LMP)
 EMS FUNC - OFF
 TRANS CONT PWR - OFF
 ROT CONTR PWR DIRECT(2) - OFF
 BMAG MODE (3) - RATE 2
 CM RCS LOGIC - OFF
 LV STAGE sw - OFF (verify)
 RHC #1 & #2 - LOCKED
 CAB PRESS REL vlv (2) - NORMAL/LATCHED
 REPRESS PKG vlv - OFF
 cb ECS XDUCR PRESS GRP 2 MNA - close
 INSTALL COAS

MONITOR LV TANK PRESS

- *If $\Delta P > 36$ psid (OXID > FUEL) or *
- *If $\Delta P > 26$ psid (FUEL > OXID) or *
- *If LOX TK PRESS > 50 psia: *
- * EMERGENCY CSM/LV SEP, pg EMER/1-1*

CYI AOS
(00:16:44)

NOTE: Steps 2 thru 22 are not sequential

- 2 SM RCS HTRS (4) - PRIM
 C/W - NORMAL
 BPC JETT KNOB - 180° from BPC JETT
 GN2 vlv HNDL - VENT (pull)
 HATCH GEAR BOX - LATCH (verify)
 ACTR HNDL SELECTOR - neutral
- 3 cb WASTE H2O/URINE DUMP HTRS (2) - close
 FC REACS vlv - NORM
 H2 PURGE LINE HTR - ON

DATE 10/11/72

- 4 MCCH - G/N Status
Z Torquing angle _____

5 SM RCS MONITORING CHECK

SM RCS PRPLNT tb (8) - gray
SM RCS He 1 & 2 tb (8) - gray
SM RCS IND - He TK TEMP
RCS IND sel - SM A, B, C, D
PKG TEMP - 115°-175° F (C/W 75°-205°)
He PRESS - 4100-4200 psia
MANF PRESS - 192-207 psia (C/W 145-215 psia)
He TK TEMP - 60°-90°F

6 CM RCS MONITORING CHECK

CM RCS PRPLNT tb (2) - gray
RCS IND sw - CM 1,2
He TEMP - 60°-90°F
He PRESS - 4100-4200 psia
MANF PRESS - 80-105 psia

7 C/W OPERATIONAL CHECK

C/W LAMP TEST - 1 (LH MA & 15 lts)
C/W LAMP TEST - 2 (RH MA & 20 lts)
C/W CSM - CM (CM RCS 1t (2) - on)
C/W CSM - CSM (CM RCS 1t (2) - out)

8 CMP to LEB for MN REG CHECK

STRUT UNLOCK LANYARD (2) - STOW
DRINKING WATER SUPPLY vlv - ON
cb COAS/TUNL LTG MNB - close
Unstow:

Helmet bags (U1)
Accessory bags (U1)
Tool E (L2)

9 CONFIRM NORMAL SUIT and CABIN PRESSURE

If cabin press > 5.3:
02 flow - ~ 0.7 lb/hr
If 4.7 < cabin press < 5.3:
02 flow - 0.6 lb/hr to pegged hi
EMERG CABIN PRESS vlv - BOTH
SUIT CKT RET vlv - open (pull)
Remove helmet & gloves & stow in PGA bag
Unstow & mount TSB's (U1)

16 ECS MONITORING CHECK

SUIT COMP ΔP - .3-.4 psid
 02 SURGE TANK PRESS - 865-935 psia
 REPRESS 02 >865 psia
 PRIM RAD tb - gray
 *If PRIM RAD tb - 2 *
 * ECS RAD FLOW AUTO CONT - 1 until*
 * tb gray, then AUTO *
 ECS RAD TEMP PRIM IN - 67-97° F
 ECS RAD TEMP PRIM OUT - -20° to +63° F
 PRIM GLY EVAP TEMP OUT - 38-50.5° F
 PRIM GLY DISCH PRESS - 40-52 psig
 SUIT TEMP - 45-55° F
 SUIT PRESS/CABIN PRESS - 4.7-5.3 psia
 PART PRESS CO2 < 7.6 mm Hg
 POT H2O QTY - 10-100%
 WASTE H2O QTY - 25-85%

17 SPS MONITORING CHECK

SPS PRPLNT TK TEMP ind - +45 to +75° F
 *IF<45°F, SPS LINE HTRS - A *
 IF>75°F, SPS LINE HTRS - off (ctr)
 SPS PRESS IND sw - He, N2A, & N2B
 SPS PRPLNT TK PRESS ind
 He 3900 psia max
 N2A 2900 psia max
 N2B 2900 psia max
 SPS PRESS IND sw - He
 FUEL & OXID PRESS ind - 170 to 195 psia
 SPS PRESS IND sw (both) - 2
 FUEL & OXID PRESS ind - 170 to 195 psia
 SPS PRESS IND sw (both) - 1
 SPS ENG INJ VLVS (4) - CLOSE
 Check SPS OXID, FUEL QTY & UNBAL
 OXID FLOW VLV PRIM - PRIM
 SPS He VLV (1&2) - AUTO, tb - bp

18 GDC ALIGN (__:__:__)

19 UNSTOW SEQ CAMERA BRACKET & ORDEAL

20 MOUNT ORDEAL BOX & INITIALIZE

DATE 9/4/72

22 UNSTOW CAMERAS

23 OPTICS DUST COVER JETT

DATE 10/11/72

24 IMU REFSMMAT REALIGN CHECK (P52)
P52 - (PAD REFSMMAT)

N71: _ _ , _ _

N05: _ _ _ . _ _

N93:

X _ _ . _ _ _

Y _ _ . _ _ _

Z _ _ . _ _ _

GET: _ _ : _ _ : _ _

If IMU is realigned,
Realign GDC (CDR)
OOE
RETICLE BRIGHTNESS - DIM

CRO AOS 25 Increase S-BD volume
(00:52:21) Two way S-BD VOICE Check
CRO LOS Report GYRO torquing angles
(00:57:44)

HSK AOS
(00:59:37)

26 SCS ATT REF COMP CHECK

VI6 N20E

FDAI SELECT - 1

FDAI SOURCE - ATT SET

ATT SET - GDC

ATT SET dials - null FDAI 1 err needles

Key VERB when nulled (freeze display)

Record from DSKY:

R _ _ , P _ _ , Y _ _

Record from ATT SET dials:

R _ _ , P _ _ , Y _ _

FDAI SEL - 1/2

HSK LOS
(01:05:11)

(_ : _ : _)

SUNSET

(01:21:48)

US AOS

(01:28:59)

DATE 10/11/72

27 EXTEND DOCKING PROBE

cb DOCK PROBE (2) - close (verify)
DOCK PROBE EXTD/REL - EXTD/REL until
full probe extension
(DOCK PROBE tb - gray at full extension)

	EXT	RET
FULL EXT	Gray	Gray
FULL RET	BP	BP
PART EXT	BP	Gray

DOCK PROBE EXTD/REL - RETRACT (tb-gray)

28 COPY TLI ABORT & P37 PADS

US LOS 29 P52 - IMU REALIGN (OPTION 3)
(01:48:42) Stow Optics Eyepieces

CYI AOS
(01:49:57)

CYI LOS VERIFY DSE TAPE MOTION
(01:54:44) (LBR/RCD/FWD/CMD RESET)

SUNRISE
(01:59:23)

CRO AOS
(02:25:02)

CRO LOS
(02:30:53)

SUNSET
(02:49:34)

HAW AOS 30 SV UPDATES, COPY TLI PAD
(02:50:15)

31 LOGIC SEQUENCE CK

cb SECS ARM (2) - close
Cue STDN

HAW LOS SECS LOGIC (2) - on(up)
(02:55:43) STDN confirm GO for PYRO ARM

DATE 10/11/72

SET STARS

R ALIGN _____
 P ALIGN _____
 Y ALIGN _____

ULLAGE _____

HORIZON/WINDOW _____

P37 FOR L/0+9

						GETI											PURPOSE	
						ΔVT											PROP/GUID	
						LONG											WT	N47
						GET 400K											P _{TRIM}	N48
X																	Y _{TRIM}	
X																	HRS	GETI
																	MIN	N33
																	SEC	
																	ΔV_X	N81
																	ΔV_Y	
																	ΔV_Z	
																	R	
																	P	
																	Y	
																	H _A	N44
																	H _P	
																	ΔVT	
																	BT	
																	ΔVC	
																	SXTS	
																	SFT	
																	TRN	
																	BSS	
																	SPA	
																	SXP	
																	LAT	N61
																	LONG	
																	RTGO	EMS
																	VIO	
																	GET	0.05G

DATE 10/11/72

DATE

SET STARS

R ALIGN _____
 P ALIGN _____
 Y ALIGN _____

ULLAGE _____

HORIZON/WINDOW _____

P37 FOR L/0+9

X				
X				

GETI

 Δ VT

LONG

GET 400K

						PURPOSE
						PROP/GUID
+						WT N47
	0	0		.		P _{TRIM} N48
	0	0		.		Y _{TRIM}
+	0	0				HRS GETI
+	0	0	0			MIN N33
+	0			.		SEC
				.		ΔV_X N81
				.		ΔV_Y
				.		ΔV_Z
X	X	X				R
X	X	X				P
X	X	X				Y
+				.		H _A N44
				.		H _P
+				.		Δ VT
X	X	X	.	.		BT
X				.		Δ VC
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
+						VIO
			.	.		GET 0.05G

DATE 10/11/72

L
2-27

TLI PREPARATION

XLUNAR - INJECT (verify)
EDS PWR - on (up) (verify)
Perform EMS ΔV TEST & NULL
BIAS CHECK, pg G/2-5
Set ΔVC
EMS FUNC - ΔV
GDC ALIGN
V48E, 31102, 01111
Key V83E
Set ORDEAL - 90/EARTH
SECS PYRO ARM (2) - ARM
TRANS CONTROL PWR - ON
ROT CONTR PWR NORMAL (2) - AC/DC (verify)
ROT CONTR PWR DIRECT (2) - MNA/MNB
SC CONT - SCS (verify)
LV/SPS IND - SIVB (verify)
cb DIRECT ULLAGE (2) - close
Set DET - 51:00

TLI PREPARATION

US AOS
(02:59:24)

P15 - TLI INITIATE/CUTOFF
V37E 15E

F 06 33	GET of TB6 Load GET of TB6 PRO	(hrs,min,.01sec)
F 06 14	VC/O Load VC/O PRO	(fps)
06 95	TFI, VG, VI	(min-sec,fps,fps)

DATE 10/11/72

L
2-28TLI, NOMINAL & MANUAL

LV GUID - IU (verify)
*If LV GUID 1t - on: *
* LV GUID - CMC *
* RHC PWR DIRECT (2) - OFF*

TB6 UPLINK ACTY 1t - on
(-09:38) SII SEP 1t - on (TIG-09:38)
TB6 + 10sec UPLINK ACTY 1t - out

51:00 SII SEP 1t - out
(-09:00) Start DET counting up
*If LV GUID - CMC: *
* V16 N20E *
* MNVR to R2 Align = _____ (278°)*

MONITOR LV TANK PRESS SEQUENCE

Nominal LOX ~ 40 psia
Nominal LH2 ~ 31 psia
*If $\Delta P > 36$ psid (OXID > FUEL) or *
*If $\Delta P > 26$ psid (FUEL > OXID) or *
*If LOX TK PRESS > 50 psia: *
* EMERGENCY CSM/LV SEP pg EMER/1-1*

ORDEAL FDAI #1 - ORB RATE
ORDEAL FDAI #2 - INERTIAL
ORDEAL MODE - HOLD/FAST
ORDEAL - 300/LUNAR
RHC #2 - ARMED

UP TLM CM - BLOCK (verify)
UP TLM IU - BLOCK (verify)

56:00 Slew FDAI #1 to PITCH = 17°
(-04:00) *If LV GUID - CMC: *
* Slew FDAI #1 to PITCH = 0° *
* V16 N20E *
* Insure R2 Align = _____ (278°)*

DATE 9/4/72

L
2-29

Insure FDAI #1 PITCH = 12°

57:10 : ORDEAL MODE - OPERATE/SLOW, IU or CMC
(-02:50)

*If LV GUID - CMC: *
* MNVR to R2 Ign = _____ (271.5°)*

58:15 DSKY BLANKS

58:20 06 95 TFI, VG, VI (Ave G on) (min-sec,fps,fps)
(-01:40)

SCS TVC SERVO PWR #1 - AC1/MNA
SCS TVC SERVO PWR #2 - OFF (verify)
TAPE RCDR - HBR/RCD/FWD/CMD RESET
EMS MODE - NORMAL
SII SEP 1t - on

58:36
(-01:24)

*If TLI Inhibit req'd: *
* before 59:42 - XLUNAR INJECT - SAFE*
* (recycle to TB5) *
* 59:42-00:12 - LV STAGE - SII/SIVB *
* (recycle to TB5) *
* after 00:12 - LV STAGE - SII/SIVB *
* (permanent inhibit)*

58:38
US LOS
(03:20:58)
59:42

SIVB ULLAGE Begins

SII SEP 1t - out (TIG - 18 sec)

DATE 10/11/72

L
2-30

59:52

SIVB FUEL LEAD

59:55

SIVB ULLAGE discontinues

Insure FDAI #1 PITCH = 6°

*If LV GUID - CMC: *

* FDAI #1 PITCH = 0° *

59:59

LV ENG 1 lt - on

00:00

SIVB IGNITION (____:____:____) GETI

00:02

LV ENG 1 lt - out

00:10

06 95

TFC, VG, VI

(min-sec,fps,fps)

MONITOR THRUST & ATTITUDE

MONITOR LV TANK PRESS

*If LV GUID - CMC: *

* Fly PITCH = 0° *

* YAW = ____ (0°) *

$+45^{\circ}/P,Y$
$+10^{\circ}/\text{sec } P,Y$
$+20^{\circ}/\text{sec } R$

01:32

PU SHIFT

ACN AOS

V16 N62E

(03:26:31)

KEY RLSE before ECO

05:46

SIVB ECO (lt on) (BEGIN TB7)

*If no ECO at TFC = 0 + 1 sec *

* or updated BT + 1 sec *

* or EMS = -150 fps (CMC failed): *

* THC - CCW & NEUTRAL in 1 sec *

Key VERB (freeze display)

Record TFC

VG

VI

ΔVC

05:56

LV ENG 1 lt - out (TB 7 + 10 sec)

KEY RLSE

F 16 95

TFC (Static), VG, VI (min-sec,fps,fps)

08:26

SIVB MNVR TO ORB RT (HDS DN) ($.3^{\circ}/\text{sec}$)

DATE 9/4/72

59:50 CMC MODE - AUTO
 59:58 Thrust +X and hold
 00:00 CSM/LV SEP pb - push, hold, and release
 LV TANK PRESS - full scale Low
 *If No Separation: *
 * cb RCS LOGIC (2) - close *
 * THC - CCW (leave in detent) *
 * DET reset and counting up (auto) *
 * LV TK PRESS - full scale low (SEP ind) *
 * 00:03 THC - neutral *

00:03 THC - release ($\Delta V \sim .5$ fps)
 SM RCS PRPLNT tb (8)-gray (verify)
 SM RCS He tb (8)-gray (verify)
 SM RCS SEC PRPLNT FUEL PRESS (4) - CLOSE
 FC REAC vlv - NORM
 02 TK 3 ISOL vlv tb - gray (verify)

4 CSM TRANSPOSITION

MAN ATT (PITCH) - ACCEL CMD
 00:15 Pitch up at $.5^\circ/\text{sec}$
 When Pitch error needle positive,
 PRO F 50 18 OMNI ANT - B
 PRO 06 18
 MAN ATT (PITCH) - RATE CMD
 F 50 18 (completion of mnvr)
 ENTR
 Thrust +X(4 sec)($\Delta V \sim .7$ fps)
 cb DIRECT ULLAGE (2) - open
 Load RCS DAP 11102, 01111
 S BD AUX TV - TV (90 sec delay)
 HI GAIN ANT TRACK - MAN
 HI GAIN ANT PWR - POWER
 Slew ANT to verify operation
 HGA angles: P = -42° , Y = $+293^\circ$
 S BD ANT OMNI - HI GAIN
 HI GAIN ANT TRACK - REACQ
 TV TRANSMIT/STBY sw - TRANSMIT
 Start DAC

DATE 10/11/72

5 DOCKING

Stabilize & align CSM

BMAG MODE (3) - ATT 1/RATE 2

At capture:

PROBE EXTD/RETR tb-bp (A, pg S/2-11) malf. DOCK

CMC MODE - FREE

2

Allow probe to damp S/C motions
(approx 10 sec)

Align Pitch and Yaw with THC (<3°)
(minimum possible)

DOCK PROBE RETRACT PRIM-1

*If no RETRACT in 30 sec: PRIM-2 *

*If still no RETRACT: SEC-1 *

After dock latches have engaged:

PROBE EXTD/RETR tb - gray

(A-1,5,9;;B-3,7,11)

SECS PYRO ARM (2) - SAFE

SECS LOGIC (2) - OFF

EDS PWR - OFF

cb EDS (3) - open

DOCK PROBE EXTD/REL - OFF

DOCK PROBE RETRACT (2) - OFF

cb DOCK PROBE (2) - open

EXT LTS - OFF (verify)

TAPE RCDR - off (ctr)

PCM BIT RATE - LOW

DAC/TV - off

S BD AUX TV - off (center)

6 POST DOCKING

RATE - HIGH

ATT DB - MAX

COAS PWR - OFF

cb RCS LOGIC (2) - open (verify)

TVC SERVO PWR #1 - OFF

THC,RHC - locked

EMS MODE - STBY

EMS FUNC - OFF

BMAG MODE (3) - RATE 2 (verify)

COUCHES - CDR-90°,CMP-0°,LMP-180°

LM PWR - OFF (verify)

TUNNEL LIGHTS - ON

02 HTR 3 - AUTO

DATE 9/4/72

- 7 EQUALIZE CM/LM PRESSURE (Decal) (pg S/2-4)
- 8 REMOVE TUNNEL HATCH (Decal) (pg S/2-5)
- 9 VERIFY DOCKING LATCHES (Decal) (pg S/2-10)
- 10 CONNECT LM UMBILICALS (Decal) (pg S/2-11)
- 11 INSTALL TUNNEL HATCH (Decal) (pg S/2-8)

LM TUNL VENT vlv - LM/CM ΔP
WASTE STOWAGE VENT vlv - VENT (verify)
TUNNEL LIGHTS - OFF

- 12 PRE LM SEP & EJECTION

cb SIVB/LM SEP (2) - close (verify)

ΔV CG - LM/CSM (verify)
EMS FUNC - ΔV SET/VHF RNG
Slew ΔV ind to +100.0
EMS FUNC - ΔV
TAPE RCDR - HBR/RCD/FWD/CMD RESET
DAC - 6 fps
Load RCS DAP 21101, X1111
Load N22 att (monitor APS mnvr, hatch window)
270.0°, 129.8°, 4.3°
V60E, V63E
GDC ALIGN
DET - RESET
cb SECS ARM (2) - close (verify)
Cue MSFN
SECS LOGIC (2) - on (up)
Obtain GO from MSFN
SECS PYRO ARM (2) - ARM
TVC SERVO PWR #1 - AC1/MNA
TRANS CONTR PWR - on (up) (verify)
RHC & THC - ARMED
V37E 47E F 16 83 $\Delta V_X, Y, Z$ (.1fps)
EMS MODE - NORMAL
Start DAC

DATE 10/11/72

13 LM SEP & EJECTION

SIVB/LM SEP - on (up)

(__:__:__)

00:00 Start DET

CMC MODE - AUTO

00:05 Thrust -X (3 sec)

14 POST LM EJECTION

PRO

F37 OOE

When CMC Acty lt out,

Key V66E

SECS PYRO ARM (2) - SAFE

SECS LOGIC (2) - OFF

cb SECS ARM (2) - open

cb SIVB/LM SEP (2) - open

02 TK 3 ISOL vlv tb - gray (verify)

MAP CAMR ON - OFF

PAN CAMR PWR - OFF

SM/AC PWR - OFF

LV/SPS IND sw - GPI

TVC SERVO PWR (2) - OFF

EMS MODE - STBY

EMS FUNC - OFF

TAPE RCDR - off (ctr)

PCM BIT RATE - LOW

Stop DAC

AUTO RCS SEL AC ROLL or BD ROLL (4) - OFF

02 HTR 3 - OFF

DATE 9/4/72

MNVR TO SIVB VIEW ATT
V49E

13:00 GO/NO GO for S-IVB YAW mnvr
17:30 GO/NO GO for S-IVB EVASIVE mnvr

*If NO APS EVASIVE at 23:00: *
* Thrust +X (6 sec) *
* Monitor SIVB thru Hatch Window *

*Time from Att for viewing SIVB *
Ejection after RCS EVASIVE mnvr
*(min:sec) Roll Pitch Yaw *
* * * *
* 25:00 286.3° 114.1° 0.0°*
* * * *
* 30:00 270.0° 129.7° 358.1°*

cb DIRECT ULLAGE (2) - open (verify)
TRANS CONT PWR - OFF
ROT CONTR PWR DIR (2) - OFF
RHC & THC - LOCKED
REPRESS PKG vlv - OFF
cb 02 ISOL/AUX BAT - open

*If no TLI: *
* SIVB - CSM/LM SEP (Earth orbit) *
* * * *
* Inertial Att *
*min-sec Event R P Y *
* * * *
00:00 Ejection 298.4° 129.8° 319.3°
* * * *
*00:05 3 sec -X *
* * * *
*00:22 Mnvr 270.0° 129.8° 4.3° *
* * * *
*03:00 6 sec -X *

DATE 10/11/72

MODE II RCS ABORT
(TWR JETT to MODE III)

00:00 THC - CCW (4 sec min)
*If No BECO: Reset THC *
* Req. RSO Shutdown *
* Reset & start DET *

00:03 *CSM/LV SEP - PUSH*
*RCS CMD - ON *

THC - ARMED
00:05 THC - NEUTRAL, then +X

00:24 THC - +X OFF
KEY RLSE to N44, Check TFF
If TFF > 2 min, Yaw 45° (LEFT) out-of-plane
BMAG MODE (3) - ATT1/RATE 2
cb MNA&B BAT C (2) - close
cb ELS/CM-SM SEP (2) - close
CM/SM SEP - on (up)
CM RCS PRESS - on (up)
RCS TRNFR - CM
C&W MODE - CM
Entry ATT - (R=0°, P=120°, Y=0°) (Comp1 by 1:40)
cb CSM/LM FNL SEP (2) - close (pull lanyard)
CSM/LM FNL SEP (2) - on (up)
EMS FUNC - ENTRY GET 300K _____
EMS MODE - NORMAL θ (.05G) _____
GET DROGUE _____

At .05G 1t - on
.05G sw - on (up)
EMS ROLL - on (up)
Fly Max Lift
N62E VI, HDOT, H

Go to LANDING PHASE pg L/4-8

DATE 10/11/72

MODE II, MODE III

MODE III SPS ABORT
($\Delta R = -400$ NM to INSERTION)

00:00 THC - CCW (4 Sec Min)
 *If No BECO: Reset THC *
 * LV STAGE sw - SII/SIVB *
 * Reset & start DET *

00:03 *CSM/LV SEP - PUSH*
 *RCS CMD - ON *

00:05 THC - ARMED
 THC - NEUTRAL, then +X
 LV/SPS IND sw - GPI

00:24 THC - +X OFF
 N5OE ΔR , HP, TFF (.1nm,min-sec)
 BMAG MODE (3) - ATT1/RATE2
 If $\Delta R > 0$:

MNVR to retro att ($R=180^\circ$, $P=194^\circ$, $Y=0^\circ$)
 (Scribe on horiz, BEF, Hds up)
 SCS TVC P&Y - AUTO (verify)
 EMS MODE - NORMAL GETI _____
 ΔV THRUST A - NORMAL (6999.9)
 02:05 DIRECT ULLAGE PB - PUSH ΔV _____
 THRUST ON PB - PUSH VC _____
 Burn to VC ($\Delta R=0$) θ _____
 ΔV THRUST (2) - OFF Δtb _____
 GET 300K _____
 θ (.05G) _____
 GET Drogue _____

If TFF > 2min, Yaw 45° (LEFT)
 out-of-plane

cb MNA&B BAT C(2) - close
 cb ELS/CM-SM SEP (2) - close
 CM/SM SEP - on (up)
 CM RCS PRESS - on (up)
 RCS TRNFR - CM
 C&W MODE - CM
 Mnvr to entry att ($R=0^\circ$, $P=105^\circ$, $Y=0^\circ$)
 (BEF, Hds Dn, Full Lift)
 cb CSM/LM FNL SEP (2) - close (pull lanyard)
 CSM/LM FNL SEP (2) - on (up)
 Note TFF

NASA — MSC

DATE 10/11/72

MODE II, MODE III