APOLLO 8

ENTRY CHECKLIST

PART NO.	S/N
SKB32100024-301	1004

VEHICLE PREPARATION

1		INITIAL STOWAGE COMPLETED
2	~~-12:00h~~ (-1h)	~~CABIN COLD SOAK~~ pg 5-16 (Supercirc Only)
3		CMC & ISS START UP pg G-14 (If req'd)
4		SCS POWER UP pg G-81 (If req'd)
5		P51 - IMU ORIENTATION pg G-55 (If req'd)
6		LOAD DAP (If req'd) V48E 11102, 01111, PRO, PRO, PRO ✓
7	-05:00h	LAST MCC DECISION
8	-04:35h	NO COMM - P52 & NAV SIGHTINGS NOMINAL - P23/37 ONBOARD COMP
9	142:00	VHF SIMPLEX A DON PGA'S & MAE WESTS
10	-03:30h	P27 (SV,REFSMMAT),NVR & ENTRY PAD UPDATES

Basic Date Nov. 6, 1968
Changed Dec. 15, 1968

CSM

VEHICLE PREPARATION

E-2(P)

P27 UPDATE

PURP	V		V		V	
GET	:	:	:	:	:	:
304 01	INDEX		INDEX		INDEX	
02						
03						
04						
05						
06						
07						
10						
11						
12						
13						
14						
15						
16						
17						
20						
21						
22						
23						
24						

N34	HRS	X X X	X X X
	MIN	X X X X	X X X X
NAV CHECK	SEC	X X .	X X .
N43	LAT	☐ 0 .	☐ 0 .
	LONG	☐ .	☐ .
	ALT	+ 0 .	+ 0 .

Basic Date Nov 6, 1968
Changed Dec. 4, 1968

Basic Date Nov 6, 1968
Changed Dec. 15, 1963

CSM 103

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E-3(P)

MANEUVER

REMARKS

GDC ALIGN _____ SET
R _____
P _____
Y _____
ULLAGE _____
HORIZ/WINDOW _____
_____
_____
_____
OTHER

	/	PURPOSE PROP/GUID
+		WT N47
☐	0 0 .	P_{TRIM} N48
☐	0 0 .	Y_{TRIM}
+	0 0	HRS GET I
+	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
☐	.	Hp
+	.	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
+		VIO
:	:	GET .05G

SUPERCIRCULAR ENTRY

REMARKS

	AREA
X X X	R .05G
X X X	P .05G
X X X	Y .05G
: :	GET HOR
X X X	P CK
O .	LAT N61
.	LONG
X X X .	MAX G
+	V_{400K} N60
- O O .	γ_{400K}
+ .	RTGO EMS
+	VIO
: :	RRT
X X :	RET .05G*
+ O O .	D_L MAX*
+ O O .	D_L MIN* N69
+	V_L MAX*
+	V_L MIN*
X X X .	D_0
X X :	RET V_{CIRC}
X X :	RETBBO
X X :	RETEBO
X X :	RETDRO
X X X X	SXTS
+ . O	SFT
+ . O O	TRN
X X X	BSS
X X .	SPA
X X X .	SXP
X X X X	LIFT VECTOR

Nov 6, 1968
Dec. 4, 1968

Basic Date Changed

Nov. 6, 1968
Dec. 4, 1968

Basic Date Changed

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11	-03:15h (__:__:__)	P52 - IMU REALIGN pg G-56 (~~PREFERRED~~ ALIGNMENT) REFSMMAT
12		P37 (NO COMM ONLY)
13		ECS CKS 02 SUPPLY REFILL pg S-12 — Step 5- go to RSS "FILL" ECS Monitor Ck pg S-5
14		EPS CKS #1 thru 4 (5 if req'd) pg S-3
15		SPS CK pg S-1 (If req'd)
16		RCS CKS SM RCS Monit Ck pg S-1 CM RCS Monit Ck pg S-1
17		C&W SYS CK pg. S-17
18		CMC SELF CK pg G-70 — Why is this in this Checklist
19		DSKY COND LT TEST pg G-76 — Checklist
20	-02:45h	MIDCOURSE MANEUVER
	-02:15h	P30 - EXT ΔV
	-02:00h	P40/41 - SPS/RCS THRUSTING MIDCOURSE (#7) BURN
21		NO COMM NAV SIGHTINGS
22		MNVR TO ENTRY ATT (Supercirc only) V62E
23		V49E
24	F 06 22	DESIRED FINAL GMBL ANGLES (.01°) LOAD ENTRY ATT PAD ANGLES PRO

25 F 50 18 REQ MNVR TO FDAI RPY ANGLES (.01°)
(AUTO) SC CONT - CMC
BMAG MODE (3) - RATE 2
CMC MODE - AUTO
PRO
(MAN) SC CONT - SCS
MNVR to 27

26 06 18 AUTO MNVR TO FDAI RPY ANGLES (.01°)

27 F 50 18 REQUEST TRIM (.01°)
~~(AUTO)~~(TRIM) ~~PRO to 26~~ Go To 25
(BYPASS) ENTR

28 BORESIGHT & SXT STAR CHECK
OPT MODE - CMC
OPT ZERO - OFF

29 V41 N91E

30 F 21 92 SHAFT, TRUN (.01°,.001°)
Load SXTS angles

31 41 OPTICS DRIVE

CHECK SXT STAR
OPT ZERO - ZERO
CHECK BORESIGHT STAR (If avail)

32 -01:35h P52 - IMU REALIGN pg G-56
Record gyro torquing angles
R ________
P ________
Y ________
If >1°, recycle P52
If confirmed, use SCS for EMS entry

33(__:__:__) GDC ALIGN
If drift >10°/hr, change rate source

34 FINAL STOWAGE
OPTICS (except for hybrid)
ORDEAL
SEC GLY TO RAD - BYPASS (verify)
Cool pnl installed
Y-Y struts (2) extended
Stow Data Box R-12
PN 382 EVAP H2O CONTR VLV PRI SEC AUTO

35 -01:20h CM RCS PREHEAT
RCS LOGIC cb (both) - CLOSE
CM RCS LOGIC - ON
Note: If sys test mtr 5c,d, 6a,b,c,d all read 3.9 vdc (28°F) or more, omit preheat
RCS CM HAS cb(s) closed
UP TLM - BLOCK (verify)
CM RCS HTRS - ON (LMP Confirm)
(20 min or til lowest rdg is 3.9 vdc) (Monitor Fuel & Ox press for press drop)

WASTE H2O DUMP - OFF
UR DUMP HT - OFF
LEB LIGHTING - OFF

-01:00h EMS CHECK

EMS FUNC - OFF
EMS cb (both) - Close
EMS MODE - STBY
EMS FUNC - EMS TEST 1 (wait 5 sec)
EMS MODE - AUTO (wait 10 sec)
Check ind lts - off
RANGE ind - 0.0
Slew hairline over notch in self - test pattern
EMS FUNC - EMS TEST 2 (wait 10 sec)
.05G lt - on (all others out)
EMS FUNC - EMS TEST 3
.05G lt - on
RSI Lower lt - on (10 sec later)
Set RANGE counter to 58 nm±0.0
EMS FUNC - EMS TEST 4
.05G lt - on (all others out)
G-V trace within pattern to lwr rt corner @9G
RANGE ind counts down to 0±0.2
EMS FUNC - EMS TEST 5
.05G lt - on
RSI upper lt - on (10 sec later)
RANGE ind - 0.0
Scribe traces vertical line 9g to 0.22±0.1
ALIGN SCROLL TO ENTRY PATTERN (on 37K ft sec line)
EMS FUNC - RNG SET
G-V scroll assy traces vert. line 0.22g to 0±0.1
EMS MODE - STBY

ΔV TEST (Deorbit only)

EMS FUNC - ΔV SET
SET ΔV ind to 1586.8 fps
EMS MODE - AUTO
EMS FUNC - ΔV TEST
SPS THRUST LT - on/off
ΔV ind stops at -20.8±20.7 (10 sec)
EMS MODE - STBY

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Changed Dec. 4, 1968
Basic Date Oct. 6, 1968
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103

30 (__:__:__) FINAL GDC DRIFT CK (If req'd)

If drift >10°/hr, Suspect GDC. Do not use RSI & FDAI #2

-01:00h TERM. CM RCS PREHEAT

UP TLM - BLOCK (verify)
CM RCS HTRS - OFF (LMP Confirm)
CM RCS LOGIC - OFF
SYS TEST METER - 4A

PYRO CIRCUIT CK

RCS LOGIC cb (both) - close (verify)
MN BUS TIES (both) - AUTO
RCS TRANS - CM
PYRO A&B SEQ A&B (both) - open (verify)
SECS ARM cb (both) - close
SECS PYRO ARM (both) - SAFE
PYRO A&B SEQ A&B (both) - close
DC IND - PYRO A(B)
* If PYRO BAT A(B)<35 vdc
* PYRO A(B) SEQ A(B) cb - open
* PYRO A(B) BAT BUS A(B) To PYRO
* BUS TIE cb - close
MNA BAT C cb - close
MNB BAT C cb - close
DC IND - MNB
PNL 8 - All cb's closed except:
PL VENT - open
FLOAT BAG (3) - open
SPS GUAGING cb (both) - open
DOCKING PROBE cb (both) - open
DIRECT ULLAGE cb (both) - open
SCS PYRO (3) cb - open

41

SEQ TEST (MSFN Monit)

SECS LOGIC cb (both) - close (verify)
SECS LOGIC (both) - on (up)
ELS - AUTO
ELS LOGIC - on (up)
MSFN confirm GO for PYRO ARM
ELS - MAN
ELS LOGIC - OFF

41A **CM RCS ACTIVATION (Supercirc only)**
- SECS PYRO ARM (both) - ARM
- CM RCS PRPLNT 1&2 - ON, tb-gray
- CM RCS PRESS - ON
- SECS PYRO ARM (both) - SAFE
- RCS Ind sw - CM1, then 2
  - He PRESS 3300-3750 psia
  - FUEL & OX PRESS 285-302 psia
- SECS LOGIC (both) - OFF
- SECS ARM cb (both) - open

41B **CM RCS CK (Supercirc only)**
- SC CONT - SCS
- Test Thrusters
- SC CONT - CMC
- RCS TRANS - SM *
- CM RCS LOGIC - on (up)

Go back to: Rate CMD & out of roller

41C **(Norm & Hybrid Deorb only)**
- SECS LOGIC(both) - OFF
- SECS ARM cb(both) - open
- RCS TRANS - SM

42-00:45m **P27 & ENTRY PAD UPDATE** — SCROLL
Go to Entry Checklist
- Supercirc - Pg. E-10
- Hybrid - Pg. E-16
- Normal Deorbit - Pg. E-23

Basic Date Nov. 6, 1968
Changed Dec. 17, 1968

Basic Date
Changed

P27 UPDATE

PURP		V	V	V
GET		: :	: :	: :
304	01	INDEX	INDEX	INDEX
	02			
	03			
	04			
	05			
	06			
	07			
	10			
	11			
	12			
	13			
	14			
	15			
	16			
	17			
	20			
	21			
	22			
	23			
	24			
N34	HRS	X X X	X X X	
	MIN	X X X X	X X X X	
NAV CHECK	SEC	X X	X X	
N43	LAT	□ 0 .	□ 0 .	
	LONG	□ .	□ .	
	ALT	+ 0 .	+ 0 .	

SUPERCIRCULAR ENTRY

EARTH ORBIT ENTRY UPDATE

X _ _ _ - _ _	X _ _ _ - _ _	AREA
X X - _ _ _ .	X X - _ _ _ .	Δ V TO
X X X _ _ _	X X X _ _ _	R .05G
X X X _ _ _	X X X _ _ _	P .05G
X X X _ _ _	X X X _ _ _	Y .05G
+ _ _ _ _ . _	+ _ _ _ _ . _	RTGO EMS
+ _ _ _ _ _	+ _ _ _ _ _	VIO
X X _ : _ _	X X _ : _ _	RET .05G
☐ 0 _ _ . _ _	☐ 0 _ _ . _ _	LAT NGI
☐ _ _ _ . _ _	☐ _ _ _ . _ _	LONG
X X _ : _ _	X X _ : _ _	RET 0.2G
☐ _ _ _ _ . _	☐ _ _ _ _ . _	DRE (55°) NGG
R R _ / _ _	R R _ / _ _	BANK AN
X X _ : _ _	X X _ : _ _	RET RB
X X _ : _ _	X X _ : _ _	RETBBO
X X _ : _ _	X X _ : _ _	RETEBO
X X _ : _ _	X X _ : _ _	RETDROG
X X X _ _ _	X X X _ _ _	(90°/fps) CHART
X X ☐ _ _ _	X X ☐ _ _ _	DRE (90°) UPDATE

POST BURN

X X X _ _ _	X X X _ _ _	R .05G
+ _ _ _ _ . _	+ _ _ _ _ . _	RTGO EMS
+ _ _ _ _ _	+ _ _ _ _ _	VIO
X X _ : _ _	X X _ : _ _	RET .05G
X X _ : _ _	X X _ : _ _	RET 0.2G
☐ _ _ _ _ . _	☐ _ _ _ _ . _	DRE ±100nm NGG
R R _ / _ _	R R _ / _ _	BANK AN
X X _ : _ _	X X _ : _ _	RETRB
X X _ : _ _	X X _ : _ _	RETBBO
X X _ : _ _	X X _ : _ _	RETEBO 47
X X _ : _ _	X X _ : _ _	RETDROG +[illegible]sec to main

SUPERCIRCULAR ENTRY

HYBRID DEORBIT

26, 1968

VEHICLE PREPARATION

EARTH ORBIT ENTRY UPDATE

X -	X -	AREA
X X - .	X X - .	Δ V TO
X X X X X X X X X	X X X X X X X X X	R .05G P .05G Y .05G
+ + .	+ + .	RTGO EMS VIO
X X :	X X :	RET .05G
☐ 0 . ☐ :	☐ 0 . ☐ :	LAT N61 LONG
X X : ☐ .	X X : ☐ .	RET 0.2G DRE (55°) N66
R R / X X :	R R / X X :	BANK AN RET RB
X X : X X : X X :	X X : X X : X X :	RETBBO RETEBO RETDROG
X X X X X ☐	X X X X X ☐	(90°/fps) CHART DRE (90°) UPDATE

POST BURN

X X X	X X X	R .05G
+ + .	+ + .	RTGO EMS VIO
X X :	X X :	RET .05G
X X : ☐ .	X X : ☐ .	RET 0.2G DRE ±100nm N66
R R / X X :	R R / X X :	BANK AN RETRB
X X : X X : X X :	X X : X X : X X :	RETBBO RETEBO 47 RETDROG ± sec to main

NOV 26, 1968

Basic Date —
Changed —

CSY

E-9C(P)

REMARKS

ENTRY

	AREA
X X X	R 05G
X X X	P 05G
X X X	Y 05G
: :	GET HOR
X X X	P CK
☐ 0 . ☐ :	LAT N61 LONG
X X X .	MAX G
+ - 0 0 .	V400K N60 T400K
+ + .	RTGO EMS VIO
: :	RRT
X X :	RET 05G
+ 0 0 . + 0 0 . + +	D_L MAX* D_L MIN* N69 V_L MAX* V_L MIN*
X X X : X X :	D_O RET V_{CIRC}
X X : X X : X X :	RETBBO RETEBO RETDRO
X X X X	SXTS
+ . 0 + . 0 0	SFT TRN
X X X X X ☐ . X X X ☐ .	BSS SPA SXP
X X X X	LIFT VECTOR

SUPERCIRCULAR ENTRY

HYBRID DEORBIT

SUPERCIRCULAR ENTRY

1 SET DET (up, to EI)

2 EMS INITIALIZATION
- SET RNG TO PAD DATA RNG
- EMS FUNC - Vo SET
- Slew Scroll to Pad Data VIO
- EMS FUNC - ENTRY

3 RSI ALIGNMENT
- FDAI SOURCE - ATT SET
- ATT SET - GDC
- EMS ROLL - on (up)
- GDC ALIGN PB - PUSH & HOLD
- YAW THUMBWHEEL - POSITION RSI THRU 45° & BACK TO LIFT UP
- GDC ALIGN PB - Release
- EMS ROLL - OFF
- R,P,Y THUMBWHEELS (3)-RESET (GDC) TO PRESENT GMBL ANGLES
- GDC ALIGN PB - PUSH

4

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CSM 03

5 DON HELMETS & GLOVES
- SUIT RTN AIR vlv - CLOSE (push)(Suite
- EMER CAB PRESS vlv - OFF (Suited)
- CMP to COUCH OPT PWA-OFF

30:00m (-30:00) MN BUS TIE (both) - ON
TAPE RCDR - REWIND - ON BOARD

6 35:00m (-25:00) SEPARATION CK LIST
- GMBL MTRS(4) - START
- PRIM GLY TO RAD - BYPASS (PULL)
- 02 PLSS VLV - ON (FILL if unsuited)
- 02 SM SUPPLY VLV - OFF
- CAB PRESS REL VLV (both)-BOOST/ENTRY NORM if unsuited
- ELS cb (both) - CLOSE(verify)
- ABORT SYS PRPLNT - RCS CMD (verify)
- SM RCS PRIM & SEC PRPLNT A(BCD)-ON tb-gray
- VHF AM (both) - OFF
- VHF ANT - RECY
- HI GAIN ANT PWR - OFF
- FC Pumps (3) - OFF
- Verify single suit compr oper, loads balanced
- FC 2 MN A&B - OFF tb-bp
- S-BD PWR AMP - LOW
- ECS RAD CONT/HTR cb(both) - open
- STM/UR DUCT HTR cb (both) - open
- HTRS OVLD cb (both) - open
- POT H2O HTR - OFF
- SEC COOL LOOP EVAP - RESET (ST sec) PUMP - OFF
- CAB FAN (both) - OFF
- GLY EVAP TEMP IN - MAN

7 MNVR TO CM/SM SEP P, R ATT
- SC CONT - SCS
- CMC MODE - FREE
- MNVR TO PAD ATT

MNVR TO PAD ATT
R_____(0°)
P_____~~(120°)~~ ~ 265°
Y_____(0°)

7A 40:00m (-20:00)
SECS ARM cb (both) - close
SECS LOGIC (both) - on(up)
MSFN Confirm GO for PYRO ARM
SECS PYRO (both) - ARM

41:00m (-19:00)
P61 - ENTRY PREP

8 V37E 61E

* 05 09 01427 - IMU REVERSED *
* 05 09 01426 - IMU UNSAT *

9 F 06 61 IMPACT LAT, LONG, HDS UP/DN (+/-)
PRO (.01°,.01°,+00001)

10 F 06 60 GMAX,V400K,GAMMA EI (.01G,fps,.01°)
Record
GMAX_____
V400K_____
GAMMA EI_____
PRO

11 F 06 63 RTOGO (.1nm)_____PAD_____
VIO (fps) _____PAD_____
TFE(min-sec)_____
Compare with MSFN for PGNS GO/NO GO
If NO COMM, set RTOGO & VIO in EMS
& initialize
(ACCEPT) PRO
(RECALC) V32E to 11

P62 - CM/SM SEP & PRE-ENTRY MNVR

12 F 50 25 00041 REQUEST CM/SM SEP
SC CONT - SCS
CMC MODE - FREE

SUPERCIRCULAR ENTRY

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43:00m (-17:00)
COMPARE PITCH ATT WITH PAD DATA_____
(within 5°)
YAW - 45° OUT-OF-PLANE(LEFT)
RATE - HIGH
ATT DB - MIN
MAN ATT (3) - RATE CMD
BMAG MODE (3) - ATT1/RATE2
MN BUS TIES (both) - ON (verify)
PRIM GLY TO RAD - BYPASS (verify)
CM RCS LOGIC - ON (Verify)

45:00m (-15:00)
CM/SM SEP (both) - ON
C&W MODE - CM
RCS TRNFR - CM
CM RCS FUEL & OX PRESS - 285-302 psia
CM RCS LOGIC - OFF

Monitor Vm A/B:
If <25vdc go to EMERG
POWERDOWN Pg EMG-3
When Vm A/B>25VDC:
SEC COOL LOOP PUMP - AC 1(2)
EVAP - EVAP

50:00m (-10:00)
AUTO RCS SEL A/C ROLL (4) - OFF
AUTO RCS SEL CM 2(6)-OFF
AUTO RCS SEL CM 1(6)-MNA ~~or MNB~~
YAW back to 0°
PITCH TO HORIZ TRACK ATT
ROLL - 0° (LIFT UP)
PITCH - 400K Horiz Mark (31.7°)
YAW - 0°
DEADBAND - MAX
EMS DATA - Verify
EMS FUNC - ENTRY (verify)
EMS MODE - AUTO
MAINTAIN HORIZ TRK
SPS P&Y cb (4) - open
PRO (Act ENTRY DAP)

13 F 06 61 IMPACT LAT,LONG,HDS DN (.01°,.01°,-00001)
PRO

14 POSS 06 22 FINAL ATT DISP, RPY (.01°)
(Only if X-axis beyond 45° of Vel vector)

HYBRID DEORBIT

SUPERCIRCULAR ENTRY

P63- ENTRY INIT

15 06 64 G, VI,RTOGO (.01G,fps,.1nm)

CMD RESET
HBR

58:00m
(-02:00)

FDAI SCALE - 50/15
ROT CONTR PWR DIR (both) - MNA/MNB
TAPE RCDR - RCD/FWD
HORIZ CK
Pitch error needle goes toward zero approaching .05G time
MAN ATT (3)- RATE CMD
If CMC is GO:
BMAG MODE (3) - RATE 2
SC CONT - CMC
CMC MODE - AUTO
* If DAP NO GO: *
* SC CONT - SCS *
* FLY BETA *
* If CMC NO GO: *
* SC CONT - SCS *
* FLY EMS *

P64 - ENTRY POST .05G

16
.05G time
(+0__:__)
(__:__:__)

RTOGO AT .05G AGREES WITH EMS-verify
.05G Lt - ON (EMS START)

* No EMS START within 3 sec: *
* EMS MODE - MAN *

.05G sw - on (up)
EMS ROLL - on (up)

06 68 BETA, VI, HDOT (.01°,fps,fps)

Compare RSI & FDAI
If CMC or PAD cmds Lift DN,
MNVR Lift DN
EMS GO/NO GO
G-V Plot within limits
Rng ctr dwn 60±7 during 10 sec period
Monitor G-meter for
convergence with pad data (Do)
(V<27K fps) Go 20

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P65 - ENTRY - UP CONT (V>27K fps)

17 F 16 69 BETA (.01°) _____ PAD _____
DL (.01G) _____ PAD _____
VL (fps) _____ PAD _____

* IF NO AGREEMENT: *
* SC CONT - SCS *
* FLY EMS *

PRO

18 06 68 BETA,VI,HDOT (.01°,fps,fps)
(V<VL+500 fps & RDOT Neg) Go to 20

P66 - ENTRY - BALLISTIC (D<DL)

19 06 22 DESIRED GMBL ANGLES RPY (.01°)
Monitor horiz ±12° of 31.7° mark

P67 - ENTRY - FINAL PHASE (0.2G)

20 06 66 BETA,CRSRNG ERR,DNRNG ERR
(.01°,.1nm,.1nm)

KEY VERB
Record DNRNG ERR _____
KEY RLSE

Monitor lift vector on RSI & FDAI

F 16 67 RTOGO,LAT,LONG (Vrel=1000 fps)
(.1nm,.01°,.01°)

RTOGO NEG - LIFT UP
RTOGO POS - LIFT DOWN
Monitor altimeter

Go to EARTHLANDING pg E-35

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CSM

HYBRID DEORBIT

E-16(H)

G&N HYBRID DEORBIT

VEHICLE PREP COMPLETE

P30 - EXTERNAL ΔV

1 V37E 30E

2 F 06 33 GETI (hr,min,.01sec)
(ACCEPT) PRO
(REJECT) LOAD DESIRED GETI

3 F 06 81 ΔVX,Y,Z (LV) (.1fps)
(ACCEPT) PRO
(REJECT) LOAD DESIRED GETI

4 F 06 42 HA,HP,ΔV (.1nm,.1fps)
Record ΔV _____
(ACCEPT) PRO
(REJECT) Reselect P30 or P27. Load new param.

5 F 16 45 M,TFI,MGA (marks,min-sec,.01°)
* MGA -00002: if *
* IMU not aligned*
SET DET
PRO

6 F 37 00E

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CSM 103

SEPARATION CK LIST

7
PRIM GLY TO RAD - BYPASS (pull)
02 PLSS vlv - ON(FILL if unsuited)
02 SM SUPPLY vlv - OFF
CAB PRESS REL vlv (both) - BOOST/ENTRY
NORM if unsuited
ELS cb (both) - close

AUTO RCS SEL CM (12) - MNA or MNB
ROT CONTR PWR NORM 1&2 - AC/DC
ABORT SYS PRPLNT - RCS CMD
SM RCS PRIM PRPLNT (4) - ON,tb-gray
VHF AM (both) - OFF
VHF ANT - RECY

DON HELMETS & GLOVES

8
SUIT RTN AIR vlv - CLOSE(push)(suited)
EMER CAB PRESS vlv - OFF(suited)
CMP to Couch

MNVR TO PAD BURN ATT

9
LOAD DAP
BMAG MODE (3) - RATE 2
SC CONT - CMC
CMC MODE - AUTO
DEADBAND - MIN
MAN ATT (3) - RATE CMD

10 V62E

11 V49E

12 F 06 22 DESIRED FINAL GMBAL ANGLES (.01°)
LOAD MNVR PAD GMBL ANGLES
PRO

13 F 50 18 REQ MNVR TO FDAI RPY ANGLES (.01°)
(AUTO) PRO
(MAN) SC CONT - SCS
BMAG MODE (3) - RATE 2
MNVR to 15

14	06 18	AUTO MNVR TO FDAI RPY ANGLES		(.01°)
15	F 50 18	REQ TRIM TO FDAI RPY ANGLES (TRIM) Go to 13 (BYPASS) ENTR		(.01°)
16		BORESIGHT & SXT STAR CHECK OPT MODE - CMC OPT ZERO - OFF		
17		V41 N91E		
18	F 21 92	SHAFT, TRUN Load SXTS angles		(.01°,.001°)
19	41	OPTICS DRIVE Check SXT STAR OPT ZERO - ZERO Check BORESIGHT STAR (If avail)		
20		V25 N17E Load Pad Data GMBL Angles for CM BURN ATT ATT SET TW - SET To PAD DATA GMBL ANGLES For CM BURN ATT		(.01°)
20A		AC PWR REDUCTION HGA PWR - OFF FC PUMPS (3) - OFF Verify single suit compr oper, loads balanced FC 2 MN A&B - OFF S-BD PWR AMP - LOW ECS RAD CONT/HTR cb(both) - open STM/UR DUCT HTR cb (both) - open HTRS OVLD cb (both) - open POT H2O HTR - OFF SEC COOL LOOP EVAP - RESET PUMP - OFF CAB FAN (both) - OFF GLY EVAP TEMP IN - MAN MN BUS TIE (both) - ON GMBL MTR (4) - START		

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21		P41 - RCS THRUSTING V37E 41E		
22	F 50 18	REQ MNVR TO LCL HORIZ (HDS DN) (AUTO) BMAGS (3)-RATE 2 SC CONT - CMC CMC MODE - AUTO PRO to 23 (MAN/DAP) BMAGS (3)-RATE 2 SC CONT - CMC CMC MODE - HOLD V62E MNVR to 24		(.01°)
23	06 18	AUTO MNVR TO FDAI RPY		(.01°)
24	F 50 18	REQ TRIM TO LCL HORIZ ALIGN SC ROLL (AUTO TRIM) PRO to 23 (BYPASS) DEADBAND - MIN RATE - LOW MAN ATT (3) - RATE CMD BMAG MODE (3) - ATT1/RATE 2 ENTR		(.01°)
	55:00m			
25	06 85	VGX,Y,Z Recheck BORESIGHT STAR TRANS CONTR PWR - ON (up) EMS MODE - STBY (verify) EMS FUNC - ΔV SET SET ΔV for SM BURN _____ EMS FUNC - ΔV S-Bd ANT - OMNI C		(.1fps)
26	59:25	RHC's and THC - ARMED DSKY CLEARS		

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59:30

27 16 85 VG,X,Y,Z (AVE G ON) (.1fps)
LIMIT CYCLE - OFF
TAPE RCDR-CMD RSET/HBR/RCD/FWD
FLT RCDR-RECORD
EMS MODE-AUTO

00:00

28 F 16 85 REQ NULL VGX, Y, Z (.1fps)
BURN EMS ΔV CTR To ZERO
If SM Only Burn - Go To Step 31
THC - LOCKED
SC CONT - SCS
CMC MODE - FREE
RATE - HIGH
GLY To RAD - BYPASS (verify)
SECS ARM cb(both) - close
SECS LOGIC(both) - on (up)
MSFN CONFIRM GO FOR PYRO ARM
SECS PYRO ARM(both) - ARM
CM RCS PRPLNT 1&2 - ON, tb-gray
CM RCS PRESS - ON
RCS Ind Sw - CM 1, then 2
He PRESS 3300-3750 psia
FUEL & OX PRESS 285-302 psia
CM RCS LOGIC - on(up)
MN BUS TIES(both) - ON (verify)
CM/SM SEP(both) - on (up)
C&W MODE - CM
RCS TRANS - CM
CM RCS LOGIC - OFF
Monitor VM A/B:
If <25 vdc,go to EMERG
POWERDOWN Pg EMG-3
When Vm A/B >25 vdc:
SEC COOL LOOP PUMP - AC1(2)
EVAP - EVAP
V63E
* If CMC NO GO: *
* FDAI SOURCE - ATT SET*
* FDAI SELECT- 1 or 2 *
* ATT SET - GDC *
MAN ATT PITCH - ACCEL CMD
FDAI SCALE - 5/5
MNVR To CM BURN ATT(Null Err Needles)
R _____ 0°
P _____ ~ 25°
Y _____ 0°

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CM RCS BURN
29 RHC #1-Continuous Pitch Down
RHC #2-Module Pitch to null needles
BURN VGZ TO ZERO
*If only 1 RHC *
* Pulse ± P=5° from retro *
* att. Maintain rates <3°/sec*

30 BURN COMPLETION AT:
ΔV CTR= _____ or DET= _____

V82E
31 F 16 44 HA,HP,TFF (.1nm,min-sec)
Check HP:
If > Pad data, continue burn
until < Pad
PRO

32 F 16 85 VGX,Y,Z (.1fps)
Read VG residuals to MSFN
(HYBRID) PRO to 33
(SM ONLY BURN)
PRO

F 37 00E

EI-15:00 V37E 47E
F 16 83 ΔVX,Y,Z (.1fps)
SC CONT - SCS
CMC MODE - FREE
MAN ATT (PITCH) - RATE CMD
RATE - HIGH
GLY to RAD - BYPASS (verify)
MN BUS TIE (both) - ON (verify)
CM/SM SEP (both) - ON
C&W MODE - CM
RCS TRNFR - CM
CM RCS LOGIC - OFF
PRO
Monitor Vm A/B:
If <25vdc go to EMERG
POWERDOWN Pg EMG-3
When Vm A/B>25vdc:
SEC COOL LOOP PUMP - AC 1(2)
EVAP - EVAP

Do the steps beginning on Pg E-20

EARTH ORBIT ENTRY
NORMAL DEORBIT

33 F 37 00E

2 FLT RCDR - OFF
TAPE RCDR - OFF
DEADBAND - MAX
EMS MODE - STBY
EMS FUNC - OFF

2 Go to EARTH ORBIT ENTRY, pg E-30(E.O.)

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NORMAL DEORBIT

VEHICLE PREP COMPLETE

P30 - EXTERNAL ΔV

1 V37E 30E

2 F 06 33 GETI (hr,min,.01sec)
(ACCEPT) PRO
(REJECT) LOAD DESIRED GETI

3 F 06 81 ΔVX,Y,Z (LV) (.1fps)
(ACCEPT) PRO
(REJECT) LOAD DESIRED GETI

4 F 06 42 HA,HP,ΔV (.1nm,.1fps)
Record ΔV _____
(ACCEPT) PRO
(REJECT) Reselect P30 or P27. Load new param.

5 F 16 45 M,TFI,MGA (marks,min-sec,.01°)
*MGA -00002: If *
* IMU not aligned*
SET DET
PRO

6 F 37 00E

7 SEPARATION CK LIST
PRIM GLY TO RAD - BYPASS (pull)
O2 PLSS vlv - ON (Fill if unsuited)
O2 SM SUPPLY vlv - OFF
CAB PRESS REL vlv (both)-BOOST/ENTRY
NORM if unsuited
ELS cb(both) - close

AUTO RCS SEL CM(12) - MNA or MNB
ROT CONTR PWR NORM 1&2 - AC/DC
ABORT SYS PRPLNT - RCS CMD
SM RCS PRIM PRPLNT (4) - ON, tb-gray
VHF AM (both) - OFF
VHF ANT - RECY

8 **DON HELMETS & GLOVES**
SUIT RTN AIR vlv - CLOSE (push)(suited)
EMER CAB PRESS vlv - OFF (suited)
CMP to Couch

9 **SPS THRUSTING PREP**
NONESS BUS - MNB

CYCLE CYRO FANS

BMAG MODE (3) - RATE 2
ΔV CG - CSM
CMC MODE - FREE
AUTO RCS SEL (16) - As req'd for ullage
SC CONT - CMC
CMC MODE - AUTO
~~OPTICS cb(both) - open~~

10 **MNVR TO PAD BURN ATT**
V62E

11 V49E

12 F 06 22 DESIRED FINAL GMBL ANGLES (.01°)
LOAD MNVR PAD GMBL ANGLES
PRO

13 F 50 18 REQ MNVR TO FDAI RPY ANGLES (.01°)
(AUTO) PRO
(MAN) SC CONT - SCS
MNVR to 15

14 06 18 AUTO MNVR TO FDAI RPY ANGLES (.01°)

15 F 50 18 REQ TRIM TO FDAI RPY ANGLES (.01°)
~~(AUTO)~~ (TRIM) ~~PRO to 14~~ Go To 13
(BYPASS) ENTR
Boresight & SXT STAR ck (if avail)

16 V37E 40E
OPT PWR - OFF

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17 F 50 18 REQUEST MNVR TO FDAI RPY ANGLES (.01°)
(AUTO) BMAG MODE (3) - RATE 2
SC CONT - CMC
CMC MODE - AUTO
PRO to 18
(MAN/DAP) BMAG MODE (3) - RATE 2
SC CONT - CMC
CMC MODE - HOLD
MNVR to 19
(MAN/SCS) SC CONT - SCS
MNVR to 19

18 06 18 AUTO MNVR TO FDAI RPY ANGLES (.01°)

19 F 50 18 REQUEST TRIM MNVR TO FDAI RPY ANGLES
ALIGN S/C ROLL (.01°)
GDC ALIGN

TVC CHECK & PREP
STAB CONT SYS cb (Pnl 8) - close
SPS cb (12) - close
DEADBAND - MIN
RATE - LOW
LIMIT CYCLE - ON
MAN ATT (3) - RATE CMD
BMAG MODE (3) - ATT1/RATE 2
ROT CONTR PWR DIRECT (both) - OFF
SCS TVC (2) - RATE CMD
If SCS, SCS TVC (2) - AUTO
* SC CONT - SCS *
TVC GMBL DRIVE P&Y - AUTO
+54:00m (-06:00) MN BUS TIES (both) - ON
TVC SERVO PWR 1 - AC1/MNA
2 - AC2/MNB
TRANS CONTR PWR - ON
ROT CONTR PWR NORMAL 2 - AC
RHC #2 - ARMED
TIG - 5 min Horiz ck - Horiz on [illegible] window mk (Limit ±3 FDAI'S Go/no Go)
If no Go:
SET TW 180, 180, 0
Track horiz with 28° window mk
At TIG-2 min - ALIGN GDC

Basic Date Nov. 6, 1968
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CSM 103

55:00m (-05:00)

PRIMARY TVC CHECK

GMBL MOT P1-Y1-START/ON(LMP confirm)
If SCS, verify Thumbwheel Trim
THC - CW
Verify NO MTVC

SEC TVC CHECK

GMBL MOT P2-Y2-START/ON (LMP confirm)
SET GPI TRIM
Verify MTVC
THC NEUTRAL
GPI returns to 0,0(CMC) or trim (SCS)
ROT CONT PWR NORM 2 - AC/DC
(TRIM) Go to step 17
(BYPASS) BMAG MODE (3) - ATT1/RATE 2 (verify)
ENTR

20 F 50 25 00204 GMBL TEST OPTION
(ACCEPT) SC CONT - CMC (verify)
PRO

Monitor GPI Response:
00,20,-20,00,02,0-2,00,Trim
*TEST FAIL: *
*SC CONT - SCS *
SCS TVC (2) - AUTO
(REJECT) ENTR

06 40 TFI,VG,ΔVM (min-sec,.1fps)
PROG ALM - TIG Slipped
*V5N9E 01703 *
*KEY RLSE to 21 *
ROT CONTR PWR DIRECT (both) - MNA/B
SPS He VLVS (both) - AUTO (verify)
LIMIT CYCLE - OFF
FDAI SCALE - 50/15
SPS P2,Y2 cb - open (for crit. burn)

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Basic Date
Changed

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Dec. 4, 1968
Basic Date
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58:00 (-02:00)

ΔV THRUST A&B - NORMAL
THC - ARMED
RHC (both) - ARMED
TAPE RCDR - RECORD/STOP/HBR/FWD

59:25 (-00:35)

DSKY BLANKS

59:30 (-00:30)

(AVE G ON)
FLT RCDR - RECORD
EMS MODE - AUTO

06 40 TFI,VG,ΔVM (min-sec,.1fps)
CHECK PIPA BIAS < 2fps for 5 sec

59:XX (-00:XX)

ULLAGE AS REQ

*IF NO ULLAGE
DIR ULLAGE PB - PUSH
*CONTROL ATT W/RHC *

MONITOR ΔVM (R3) COUNTING UP

59:55
(-00:05)
F 99 40 ENG ON ENABLE REQUEST
(AUTO IGN) PRO AT TFI ≥0 sec
(BYPASS IGN) ENTR to 24
~~V34E~~ - EXIT V37E 00E

22 00:00 IGN *If SCS - THRUST PB - PUSH*

06 40 TFC,VG,ΔVM (min-sec,.1fps,.1fps)
*F 97 40 SPS Thrust fail *
*~~(TERM) V34E EXIT~~ *
*(RESTART) PRO To IGN *
(RECYCLE) ENTR To TIG-05 sec
SPS THRUST LITE - ON
MONITOR THRUSTING
Pc 95-105 psia
EMS COUNTING DOWN
SPS INJ VLVS (4) - OPEN
SPS He VLVS tb - gray
SPS FUEL/OXID PRESS - 175-195 psia
PUGS - BALANCED
*PROG ALARM *
V5N9E 01407 VG INC
THC - CW, FLY MTVC
ECO
*EMER SPS CUTOFF: *
* ΔV THRUST A&B - OFF*

23 F 16 40 TFC(STATIC),VG,ΔVM (min-sec,.1fps)
ΔV THRUST A/B - OFF
VERIFY THRUST OFF
SPS INJ VLVS (4) - CLOSED
SPS He TB (2) - BP

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Changed 12/4/68

Basic Date 6, 1968
Changed 15, 1968

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SPS P2,Y2 cb - closed(verify)
TVC SERVO PWR 1&2 - OFF
FLT RCDR - OFF
~~MN BUS TIES (both) OFF~~
PRO

24 F 16 85 VG XYZ(CM) (.1fps)
NULL RESIDUALS
RECORD ΔV CTR & RESIDUALS
EMS FUNC - OFF
EMS MODE - STBY
BMAG MODE (3) - RATE 2
DEADBAND - MAX
TAPE RCDR - STOP
NONESS BUS - OFF
TRANS CONT PWR - OFF
PRO

25 F 37 V82E

26 F 16 44 HA,HP,TFF (.1nm,min-sec)
R3-59B59 HP >49.4 nm
PRO

27 F 37 00E

BURN STATUS REPORT

____	ATIC	____	VI
____	BT	____	HDOT
____	VGX	____	H
____	R	____	ΔVC
____	P	____	FUEL
____	Y	____	OXID
		____	UNBAL

REMARKS

EARTH ORBIT ENTRY

NORMAL DEORBIT

EARTH ORBIT ENTRY

1 **CM RCS ACTIVATION** (Norm Deorb Only)

SECS LOGIC(both) - on(up)
SECS ARM cb(both) - close
MSFN Confirm Go for PYRO ARM
SECS PYRO ARM (both) - ARM
CM RCS PRPLNT 1&2 - ON, tb-gray
CM RCS PRESS - ON
RCS Ind sw - CM1, Then 2
He PRESS 3300-3750 psia
FUEL & OX PRESS 285-302 psia

2 **Verify CM/SM SEP ATT**

R _____(180°)
P _____
Y _____(0°) (Yaw later)

2A **EMS INITIALIZATION**

EMS FUNC - RNG SET
SET RNG TO PAD DATA RNG
EMS FUNC - Vo SET
Slew scroll to pad data VIO
EMS FUNC - ENTRY

2B **RSI ALIGNMENT**

FDAI SOURCE - ATT SET
ATT SET - GDC
EMS ROLL - on(up)
GDC ALIGN PB - PUSH & HOLD
YAW TW - POSITION RSI THRU 45° & BACK TO LIFT UP
GDC ALIGN PB - RELEASE
EMS ROLL - OFF
R,P,Y TW (3) - RESET (GDC) TO PRESENT GMBL ANGLES
GDC ALIGN PB - PUSH

Changed

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2C **PWR REDUCT** (Norm Deorb Only)

HI GAIN ANT PWR - OFF
FC Pumps (3) - OFF
Verify single suit compr oper, loads balanced
FC 2 MN A&B - OFF, tb-bp
S-BD PWR AMP - LOW
ECS RAD CONT/HTR cb(both) - open
STM/UR DUCT HTR cb (both) - open
HTRS OVLD cb (both) - open
POT H2O HTR - OFF
SEC COOL LOOP EVAP - RESET
PUMP - OFF
CAB FAN (both) - OFF
GLY EVAP TEMP IN - MAN

P61 - ENTRY PREP

3 V37E 61E

05 09 01427 - IMU REVERSED
*05 09 01426 - IMU UNSAT *

4 F 06 61 IMPACT LAT, LONG, HDS UP/DN(+/-)
(.01°,.01°,±00001)

PAD VALUES
LAT _____
LONG _____
HDS UP/DN _____
PRO

5 F 06 60 GMAX,V400K,GAMMA EI (.01G,fps,.01°)
Record
GMAX _____
V400K _____
GAMMA EI _____
PRO

6 F 06 63 RTOGO (.1nm) _____ PAD _____
VIO (fps) _____ PAD _____
TFE(min-sec) _____
Compare with MSFN for PGNS GO/NO GO
NO COMM, set RTOGO & VIO in EMS
& initialize

(ACCEPT) PRO
(RECALC V32E to 6

P62 - CM/SM SEP & PRE-ENTRY MNVR

7 F 50 25 00041 REQUEST CM/SM SEP
SC CONT - SCS
CMC MODE - FREE
YAW 45° out-of-plane (left for RCS, Rt for SPS)
RATE - HIGH
DEADBAND - MIN
MAN ATT(3)-RATE CMD
BMAG MODE (3)-ATT 1/RATE 2
PRIM GLY to RAD - BYPASS (verify)

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EARTH ORBIT ENTRY

(__:__:__) CM RCS LOGIC - on(up) (verify)
MN BUS TIES(both) - ON (verify)
CM/SM SEP (both) - on(up)
C&W MODE - CM
RCS TRANS - CM
CM RCS FUEL PRESS - 285-302 psia
OX PRESS - 285-302 psia
CM RCS LOGIC - OFF
Monitor Vm A/B:
If <25vdc go to EMERG
POWERDOWN Pg EMG-3
When Vm A/B>25vdc:
SEC COOL LOOP PUMP - AC 1(2)
EVAP - EVAP
AUTO RCS SEL A/C ROLL (4) - OFF
AUTO RCS SEL CM 2(6) - OFF
AUTO RCS SEL CM 1(6) - MNA or MNB
YAW back to 0°
PITCH TO ENTRY ATT
ROLL 0° (LIFT UP)
PITCH - HORIZ on 31.7° MARK (400K)
YAW 0°
DEADBAND - MAX
MAN ATT (PITCH) - ACCEL CMD
EMS DATA - Verify
EMS FUNC - ENTRY (verify)
EMS MODE - AUTO
MAINTAIN HORIZ TRK
PRO (Act ENTRY DAP)

8 F 06 61 IMPACT LAT,LONG,HDS/DN (.01°,.01°,-00001)
PRO

9 POSS 06 22 FINAL ATT DISP, RPY (.01°)
(Only if X-axis beyond 45° of Vel vector)

NORMAL DEORBIT

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CSM 103

EARTH LANDING

P63 - ENTRY INIT

10 06 64 G,VI,RTOGO (.01G,fps,.1nm)
FDAI SCALE - 50/15
ROT CONTR PWR DIR (both) - MNA/MNB
TAPE RCDR - HBR/RCD/FWD
FLT RCDR - ON
HORIZ CK
Pitch error needle goes toward
error approaching .05G time
MAN ATT ~~(PITCH)~~ - RATE CMD (3)
If CMC is GO:
BMAG MODE (3) - RATE 2
SC CONT - CMC
CMC MODE - AUTO
*If DAP NO GO: *
* SC CONT - SCS*
* FLY BETA *
*If CMC NO GO: *
* SC CONT - SCS*
* FLY EMS *
RCS Deorb: Roll HDS UP
Trunk horiz with 29° window mark

P64 - ENTRY POST .05G

11 RTOGO AT .05G AGREES WITH EMS-verify
.05G time
(+0__:__:__) EMS - MAN

Horiz Ck
Compare Pitch ATT @ .05G with PAD DATA ____

RCS board:
Roll Hdz up

.05G sw - on(up)
EMS ROLL - on(up)
06 68 BETA, VI, HDOT (.01°,fps,fps)
Compare RSI & FDAI
If CMC or PAD cmds Lift DN,
MNVR Lift DN
EMS GO/NO GO
G-V Plot within limits
Rng ctr dwn 40+10 during 10sec period
Monitor G-meter for
convergence with pad data (Do)
(V<27K fps) Go To 15

EARTH ORBIT ENTRY

P65 - ENTRY - UP CONT (V>27K fps)

12 F 16 69 BETA (.01°) _____ PAD _____
DL (.01G) _____ PAD _____
VL (fps) _____ PAD _____
IF NO AGREEMENT:
*SC CONT - SCS *
*FLY EMS *
PRO

13 06 68 BETA, VI, HDOT (.01°,fps,fps)
(V<VL +500 fps & RDOT Neg) Go To 15

P66 - ENTRY - BALLISTIC (D<DL)

14 06 22 DESIRED GMBL ANGLES RPY (.01°)
Monitor horiz ±12° of 31.7° mark

P67 - ENTRY - FINAL PHASE (0.2G)

15 06 66 BETA,CRSRNG ERR.DNRNG ERR
(.01°,.1nm,.1nm)
KEY VERB
Record DNRNG ERR_____
KEY RLSE
Limit: ± 100nm from Pad DRE
Monitor lift vector on RSI & FDAI

F 16 67 RTOGO,LAT,LONG (Vrel=1000 fps)
(.1nm,.01°,.01°)
RTOGO NEG - LIFT UP
RTOGO POS - LIFT DOWN
Monitor altimeter

Go to EARTHLANDING pg E-35

NORMAL DEORBIT

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90K' STEAM PRESS-PEGGED
40K' CABIN PRESS REL vlv (both)-BOOST/ENTRY(Unsuited)
(90K+63S)
* CM UNSTABLE *
* RCS CMD - OFF *
* 40K' APEX COVER JETT PB-PUSH *
* DROGUE DEPLOY PB - PUSH (2 sec*
* after apex cover jett) *

30K' ELS LOGIC - ON(up)
ELS - AUTO

24K' RCS disable (auto)
(90k+92s)
* RCS CMD - OFF *

Apex cover jett (auto)
* APEX COVER JETT PB - PUSH *
(WAIT 2 SECS)

Drogue parachutes deployed (auto)
* DROGUE DEPLOY PB - PUSH *

If Drogues Fail:
X ELS-MAN X
X RCS CMD-ON X
X Stabilize CM X
X 5k' MAIN DPLY PB-PUSH X
X ELS-AUTO X

23.5K' Cabin Pressure increasing (DROG +50s)
* If not increasing by 17K': *
* CABIN PRESS REL vlv (RH) - DUMP *

10K' Main parachutes deployed
(Pc = 10) MAIN DEPLOY PB - PUSH (within 1 sec)
FLOAT BAG 3 cb - close
VHF ANT - RECY
VHF AM(A) - SIMPLEX
VHF BCN - ON
PL BCN LT - ON HIGH STRUT LOCKS (both) - UNLOCK
Remove SIDE HATCH JACK SCREWS
CABIN PRESS RBL vlv(both)-CLOSE
DIRECT O2 - OPEN(CCW)
CM RCS LOGIC - ON(up)
CM PRPLNT - DUMP(burn audible)

MONITOR CM RCS 1&2 for He press decrease
* NO BURN or PRESS DECREASE *
* USE BOTH RHC's *
* DO NOT FIRE PITCH JETS *
CM PRPLNT-PURGE (to zero He press)
* CM RCS He DUMP PB - PUSH *
* RHC (both) - 30 secs *
* NO PITCH *
CABIN PRESS REL v1v (both) -BOOST/ENTRY
STRUT LOCKS (both) - UNLOCK

FLT & PL BAT BUS A,B,&BAT C cb(3)-CLOSE
FLT & PL MNA & B cb (2) - OPEN

3K' CABIN PRESS REL v1v(RH) - DUMP
FLOOD POST LDG
CM RCS PRPLNT (both) - OFF
ROT CONTR PWR DIRECT - OFF

800' CAB PRESS RELV v1v - CLOSE (latch off)
MN BUS TIES (both) - OFF

+00:18m LANDING
MAIN REL PYRO cb (both) - close
MAIN RELEASE - on(up)

Go to POSTLANDING

Basic Date Nov 6, 1968
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POSTLANDING

STABILIZATION, VENTILATION, COMMUNICATIONS

1 Remove helmets
DIRECT 02 - CLOSE (CW)

2 Stabilization after landing
ELS - AUTO (verify)
MAIN REL PYRO cb (both) - close (verify)
MAIN RELEASE - on (up) (verify)
SECS PYRO (both) - SAFE
SECS LOGIC (both) - OFF
BAT RLY BUS cb (2) - OPEN
*No contact: *
*VHF AM A&B - OFF *
VHF AM RCV only - A
PL VENT cb - close
FLOAT BAG cb (3) - Close
UPRIGHT SYS COMPRESS cb(both)-close
If Stable II:
FLOAT BAG (3)- Fill Till 2 min after upright, then - OFF
VHF AM A/B & BCN-OFF while inverted
IF stabe I:
After 10 min Cooling Period
FLOAT BAG(3)-Fill 7 min, then OFF

3 Post Stabilization and Ventilation

PL VENT v1v - UNLOCK (Pull)
Remove PL VENT Exh Cover
PL VENT - HIGH or LOW
PL DYE MARKER - ON (swimmer comm)
Release footstraps and restraints
MNA BAT BUS A & BAT C cb (2) - open
MNB BAT BUS B & BAT C cb (2) - open
FLT & PL BAT C cb - open

PYRO A SEQ A cb - OPEN
PYRO B SEQ B cb - OPEN
* EACH HR - CHECK D-C VOLTS 27.5 V *
* If Not: *
* FLT & PL-BAT BUS A&B cb (2) -OPEN*
* FLT & PL BAT C cb (2) - OPEN *
* GO TO LOW POWER CHECKLIST pg E-38*
Unstow and install PLV DISTRIB DUCT
Deploy grappling hook and line if req.

4 Post Landing Communications
VHF ANT-RECY (verify)
VHF BCN - ON (verify)
If no contact with recovery forces
perform VHF BEACON Check
MONITOR VHF BEACON transmission
with Survival Transceiver
* VHF Beacon not operating *
* connect Survival Transceiver to ANT*
* Cable and place radio in BCN mode *

LOW POWER CHECKLIST
VHF BCN - OFF
VHF (3) - RCV
FLOOD FIXED - OFF
VHF AM A&B - OFF (center)
VHF AM REC ONLY - A (verify)
COUCH LIGHTS - OFF
POSTLANDING VENT SYS: minimize use
SURV RADIO - plug into VHF BCN ANT cable
CONN & turn radio on in BCN mode

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EGRESS PROCEDURES

STABLE I

Disconnect umbilicals
Neck dam on
CMP — Center couch - 270° position
CDR,LMP — Armrests folded
CDR — Connect raft to S/C, if desired, with green lanyard
Connect raft white lanyards to suits & inflate water wings when exiting
Hatch piston press vlv - Press (Inbd)
CMP — Side Hatch opened
CDR — PL VENT-OFF
CMP — Pnl 250 cbs (all)-open
LMP — Egress with liferaft
Put hardware kit out
LMP, CDR or C. — Egress

STABLE II

LMP — CB CREW STA AUDIO (3) - open
ALL — PWR (3) - OFF
SUIT PWR (3) - OFF
Remove helmets
Disconnect umbilicals
Release footstraps
Release restraint harness
CMP — Couch seat pans (3) - 170° position
Arm rests folded
CDR — Survival kits removed from stowage
CMP — Connect liferaft mainline to CDR or S/C
Connect first white lanyard from liferaft to suit
CDR — Connect third white lanyard from liferaft to suit
LMP — Connect rucksacks together to yellow lanyard on raft bag
CMP — PRESSURE EQUALIZATION vlv - OPEN
CMP,LMP — Remove and stow fwd hatch
CMP — Exit feet first with rucksacks; when clear of S/C inflate water wings and raft
LMP — Exit feet first; when clear of S/C inflate water wings
CDR — Exit feet first; when clear of S/C inflate water wings

Basic Date Changed

FIRE/SMOKE IN CM DURING ENTRY

1 CABIN FANS - OFF

2 Monitor EPS indicators for excessive current.
Immediately remove power from affected bus.

3 ROT CONTR PWR DIRECT (both) - MNA/MNB
& maintain attitude if required.

4 If affected bus is:

MNA

AC INV 1 AC BUS 1 - OFF
AC INV 2 AC BUS 1 - ON
Set up for CM/RCS sys 2
AUTO RCS SEL A/C ROLL (4) - OFF
CM 1(6) - OFF
CM 2(6) - MNB
~~Follow normal~~ RCS dump ~~procedure~~ is fuel rich ~~using TBD deviations for a fuel rich dump~~.

MNB:

AC INV 2 AC BUS 2 - OFF
AC INV 1 AC BUS 2 - ON
~~Follow normal~~ RCS dump ~~procedure~~ is oxid rich ~~using TBD deviations for an oxidizer rich dump~~.

5 CAB PRESS RELF vlv (RH) - DUMP

6 Continue ENTRY

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CSM 103

Contamination in CM

1 Don 02 masks and/or PGA's immediately

2 Evaluate contamination level (isolate & correct source of contamination if possible) and proceed with one of the following steps:

a. Retain 02 masks or remain in suit and accept contamination level in cabin.

CAUTION

If in PGA's, adjust DIRECT 02 to maintain suit to cabin ΔP 0.38 psi.

b. Retain 02 masks and scrub cabin atmosphere through suit loop. If initially suited, establish partially suited or shirtsleeve configuration and don 02 masks.

CAUTION

Change LiOH cartridges after scrub completed.

c. Retain PGA's or don PGA's
Verify suit integrity (visually)
Perform Cabin Dump
Perform Cabin Repress

Contamination In Suit

1 SUIT COMPR 2 - AC1

2 SUIT COMPR 1 - OFF

3 DIRECT 02 vlv - OPEN (CCW) for 1 minute then close (cw)

If condition persists:

4 SUIT COMPR 2 - OFF

5 DIRECT 02 vlv - OFF

6 Doff helmet

7 Don emergency 02 masks

EMERGENCY EARTH LANDING

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CS 103

EMERGENCY POWERDOWN

(After DC powerdown preceding CM/SM separation) NOTE: Use only after FC or BAT loss, no short verified, & main bus voltage <26.0 VDC

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Powerdown the following components until bus voltage ≥26.5 VDC

O_2 HTRS (both)-OFF	11.0amp
NON ESS BUS-OFF	4.9
FLT QUAL RCDR-OFF	.74
GMBL MTRS(4) - OFF	
ECS RAD HTRS(both)-OFF	17.3
SM RCS HTRS A,B,C,D-OFF	2.86ea
H2 HTRS(both)-OFF	1.44
SPS LINE HTR-OFF	1.03
LIGHTS-Min reqd	-
CMC to STBY	2.0
V48E	
F04 46 Load 0 Left digit R1	
PRO,PRO,PRO, V46E	
F 50 25 00062 CMC PWR DN	
PRO-HOLD Until STBY Lt On	
G&N PWR-OFF	1.5
IMU PWR DN(STBY)	5.7
CMC MODE-FREE	
G&N IMU PWR-OFF	
S-Bd PWR AMP-OFF	3.53
TAPE RCDR - OFF	1.82
Power SCE-OFF	.65
TELECOM GRP 1&2-OFF	2.2
Configure for single inverter oper	
INSTRUM ESS MN A&B cb(both)-Open	5.54
SUIT COMPR-OFF	
DIR 02-ON(If Suited)	
GLY EVAP STM PRESS - MAN	
STM PRESS - INCR (58sec)	
H20 FLOW - OFF (ctr)	
ECS GLY PUMPS - OFF	

SMS RCS THRUSTER FAILED-ON

1 SC CONT To Alternate Source
2 ROT CONTR PWR DIRECT(both)-MN A/B
(control rates in direct)
3 AUTO RCS SEL-OFF (in affected axis)
4 DIRECT Ullage cb(both)-Open
5 If vehicle rates are still uncontrolled:
a. AUTO RCS SEL (16)-On
b. MAN ATT (3)-ACCEL CMD
c. ROT CONTR PWR DIRECT(both)-OFF
6 If rates are still uncontrolled:
SMS RCS Prplnt-OFF

CM RCS THRUSTER FAILED-ON

1 RCS CMD-OFF
2 If Thruster is still on:
a. CM AUTO RCS SEL 1-OFF
b. CM AUTO RCS SEL 2-ON
c. RCS CMD-ON
3 If Thruster is still on:ROT CONTR PWR DIRECT(2)-OFF
4 If Thruster is still on: CM RCS Prplnt 1-OFF
5 If Thruster is still on: CM RCS Prplnt 1-ON
CM RCS Prplnt 2-OFF

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CM RCS FAILS TO PRESSURIZE OR FEED PRPLNT

1 Verify Electrical power for pressurization
a. EPS BAT BUS A/B(both)cb-Close (Pnl 229)
b. PYRO A/B SEQ A/B cb(both)-Close (Pnl 250)
c. SECS ARM cb(both)-Close(Pnl 8)
d. SEC PYRO ARM(both)-ARM
e. SECS LOGIC(both) - ON
2 Cycle CM RCS - PRES
3 Verify ELEC PWR To CM RCS Prplnt vlvs
a. EPS GRP 1 & 3 cb-Close
b. RCS SM HTR - A & B cb-Close(Pnl8)
c. RCS Prplnt Isol cb(both)-Close(Pnl 8)
4 Cycle CM RCS Prplnt (2)-ON
5 OPEN He and Prplnt X-Feed
a. EPS GRP 5 cb-Close (Pnl 229)
b. RCS LOGIC cb-Close (Pnl 8)
c. CM RCS LOGIC - On(Up)
6 CM Prplnt - Dump momentarily then Off.

SPS ENGINE DOES NOT SHUT DOWN AUTOMATICALLY

1 ΔV THRUST A&B - OFF
2 THC - CW
3 CHECK SPS DIRECT ON - OFF
4 SPS PILOT vlv (2) CB's - OPEN (PNL 8)
5 EPS Group 5 CB's - OPEN (PNL 229)

MN BUS A(B) UNDERVOLTAGE LITE ON

1 CK MN Bus Voltage
2 If only one bus low with High FC Current, isolate and reconfig
3 If both busses low:
a. Use powerdown CKlist Pg.S EMG-5 if DC PRW reduct prior to sep has <u>not</u> been accomplished.
b. After DC PWR reduct use powerdown CKlist Pg. E EMG-3.

AC BUS 1(2) LIGHT ON WITH MN BUS A(B) UNDERVOLT AND/OR AC BUS 1(2) OVERLOAD

1 Turn OFF associated inverter within 5 sec.

CABIN PRES DECREASING

1 Cabin Relief Valve - Close
2 Cabin Relief Valve - Boost/Entry After Drogue Deployment

O_2 FLOW Hi LIGHT ON

1 Verify Hi Flow
2 If Cabin Pres is not decreasing:
  Surge Tank - OFF
  PLSS Fill vlv - OFF

SUIT COMPRESSOR FAILS WHILE SUITED

1 Select Redund Suit COMPR On Alternate Bus
2 Direct O_2 vlv - ON
3 When Feasible Remove Helmets

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EMERGENCY SAFE OF APEX COVER JETT

If No MSFN GO For Pyro Arm Indicates Apex Cover Jettision,
  SECS LOGIC (2)-OFF
  cb ELS (2)-open
  SECS LOGIC (2)-On
If MSFN GO, Go To Step A
If Still Apex Cover Jettision,
  cb SECS LOGIC A - open
If MSFN GO, Go To Step B
If Still Apex Cover Jettision,
  cb SECS LOGIC A - close
  cb SECS LOGIC B - open
If MSFN GO, Go To Step C
If Still Apex Cover Jettision,
  ELS-MAN
  ELS LOGIC - OFF
  SECS LOGIC (2) -OFF
  cb SECS LOGIC (2) - open
  cb SECS ARM (2) - open
    CMP To LEB
  cb SEQ A&B PYRO A&B(2) - open (pnl 250)
  Verify Pyro bus A&B voltage 0
  Use Tool E, (5/32 allen head) to remove closeout panel located beneath panels 276 & 277 (approx 10 fasteners on panel)
  Remove, or cut all wires to, connector marked "cut" with white tag (P545). Tape ends of any wires cut. Replace closeout panel.
  cb SEQ A&B PYRO A&B - Close
  Verify PYRO Bus A&B voltage >35 vdc
  cb ELS (2)-Close
  cb SECS LOGIC (2)-Close
  cb SECS ARM (2)-open(verify)
  DO NOT ARM PYRO BUSES

Continue Normal Entry Except,

Perform CM RCS pressurization & CM/SM Separation together at which time ARM PYRO's in the following manner:
SECS PYRO ARM (B)-SAFE (verify)
SECS PYRO ARM (A)-ARM

To Jettision Apex Cover At 24K':
SECS PYRO ARM (B) - ARM

STEP A
cb ELS(2) - open (verify), close at or after apex cover jettision at 24K'
Continue Normal Entry

STEP B
cb SECS LOGIC A - open (verify), close at or after apex cover jettision at 24K'
Continue Normal Entry

STEP C
cb SECS LOGIC B - open(verify), close at or after apex cover jettision at 24K'
Continue Normal Entry

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