

APOLLO II	
ENTRY OPERATIONS CHECKLIST	
PART NO	S/N
SKB32100080-308	1001

APRIL 15, 1969

Basic Data

2000 07 8 CINDY

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Basic Date APRIL 15, 1969
Changed MAY 14, 1969

CSM 07 & SUBS

SAFETY
SIGHTS
SIGHTS
SIGHTS

SAFETY
SIGHTS
SIGHTS

SAFETY
SIGHTS
SIGHTS

SAFETY
SIGHTS
SIGHTS

L.H. EQUIPMENT BAY

ENTRY

L2

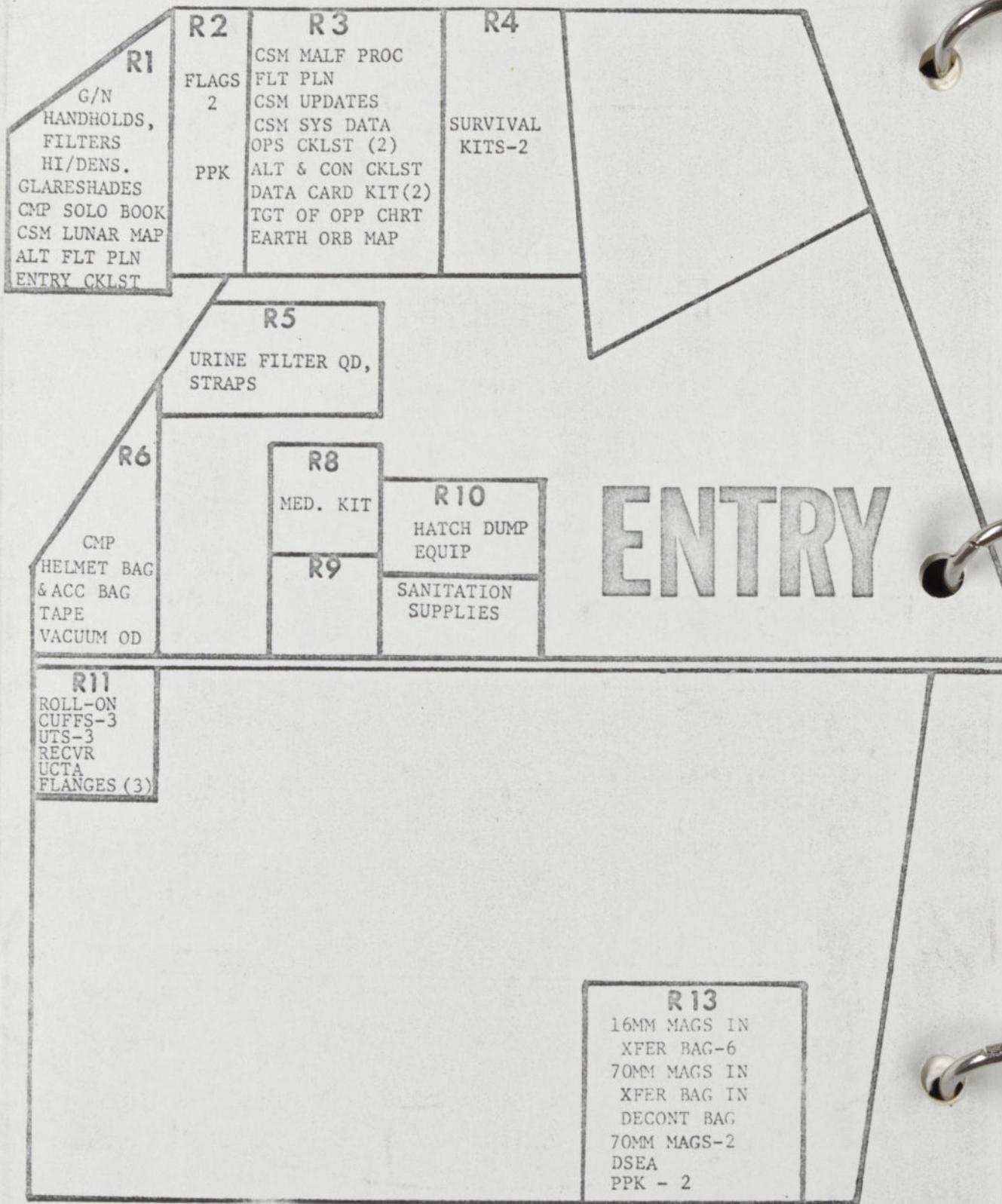
TOOL-E, CCU CABLE,
GROUNDING CABLE,
CCU CONTROL HEAD

L3

HELMET AND GLOVES W/
ACC & HELMET BAG
FOOD
FOOD RESTRAINING
POUCH & CONTING. FEEDING
VALVE ADAPTER

NOTE: HEAD PADS - ON COUCH
HEELCLIPS - ON CREW
CMP PGA, ELECT. COVER, HELMET, SHIELD,
AND GLOVES IN SLEEP RESTRAINT W/ROPE
UNDER R/H COUCH

R.H. EQUIPMENT BAY



AFT BULKHEAD

A3

CO₂ ABSORBERS (4)

BEEPER UNDER A3

A4

CO₂ ABSORBERS (4)

A5

SPOTMETER, TIMER
CSC CASSETTE W/
BAG,
70MM BATT

A6

CO₂ ABSORBERS-2
TV-CABLES-2
TV MONITOR&BRKT
URINE HOSE
(UNDER A6)

ENTRY

A7

TV CAMERA
RINGSIGHT

A1

70MM BRKT
AMPULES
TEMP STOWAGE BAGS (3)
O2 INTERCONNECTS (3)
PLV DUCTS
16MM MAG.
SEA WATER PUMP
SNAGLINE
PROBE STRAPS (2)
TISSUE DISPENSER (5)
TOWELS (3)
TOOL SET
PENLIGHTS-5
H₂ SEP. CIGARS
SHAVING EQUIPMENT

PGA BAG

O2 HOSE SCREEN CAPS-3
COUCH STRAPS-3
PGA ELECT. COVER
-2 ON PGA'S
UCTA CLAMP-3
PGA-(LMP&CDR)

A8

CWG ELECT. ADAPT.
70MM MAGS W/BAG-3
CWG's (3)
EXERCISER
FCS (2)
LCG'S (2)
LWHS (3)
EMU MAINT KIT
PPK(3)
LM PPK-4 (REPLACE
FOOD)

VACUUM BRUSH

U3

16MM BRKT
COAS BLBS
LM DOCK
TARGET

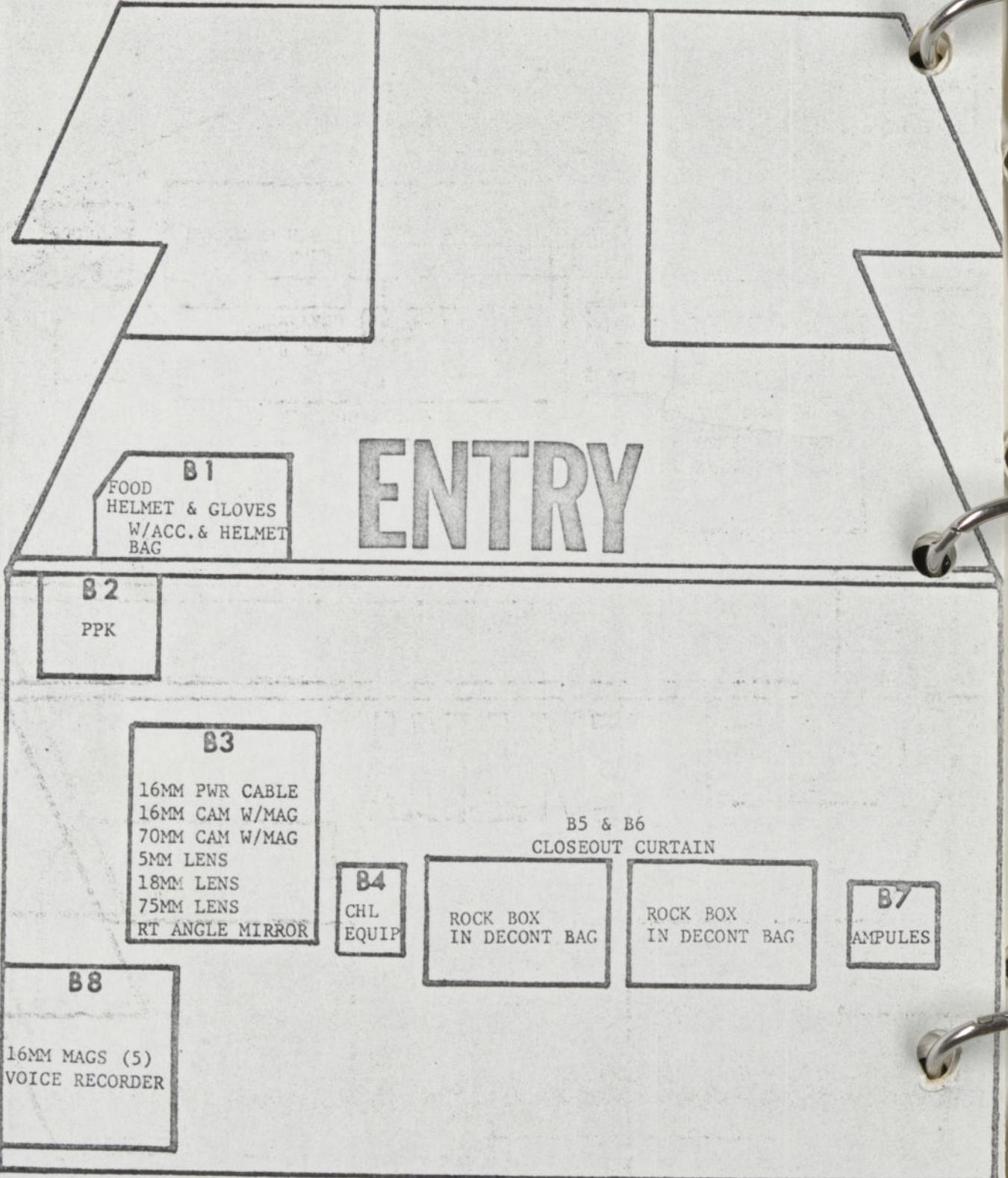
LH & CTR
SLEEPING BAG

WINDOW SHADE
O2 MASKS

U4

RECORDER
TAPE&BATT
INTERVOLOMETER
250MM LENS
MONOCULAR

LOWER EQUIPMENT BAY



April 15, 1969
27 1069

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Basic Date April 15, 1969
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CSM 10 SUBS

E

1-1

SECTION 1. VEHICLE PREPARATION

For deorbits perform steps with "*"; timeline is for
Lunar Return

- 1 *INITIAL STOWAGE COMPLETED
- 2 *CMC & ISS START UP pg F/2-1
- 3 *SCS POWER UP pg F/9-1
- 4 *P51 - IMU ORIENTATION pg F/6-1
- 5 *LOAD DAP
V48E 11102, 01111, PRO, PRO, PRO
- 6 -06:00h LAST MCC DECISION
- 7 -05:35h NO COMM - P52 & NAV SIGHTINGS
- 8 *DON MAE WESTS & FOOT RESTRAINTS
- 9 ACTIVATE VHF FOR COMM CHECKS
- 10 -04:30h *P27 (SV, REFSMMAT), MNVR
& ENTRY PAD UPDATES
- 11 -04:15h P52 - IMU REALIGN pg F/6-2
(OPTION 1)
- 12 P37 (NO COMM ONLY)
- 13 *CABIN COLD SOAK (CREW OPTION) pg F/10-12
- 14 *ECS CKS
O2 SUPPLY REFILL pg F/10-7
PGA verification, (if suited) F/10-10
ECS Monitor Ck pg F/10-4
(382) EVAP H2O CONT PRI vlv - AUTO
EVAP H2O CONT SEC vlv - AUTO
SUIT HEAT EXCH SEC GLY - FLOW
- 15 *EPS CKS #1, 3, 4 (5 if req'd) pg F/10-2

1. VEH PREP

2. SUPERCRIC ENTRY

7. ENTRY RMDP

1. VEH PREP

E
1-2

- 16 *SPS CK (If req'd) pg F/10-1
- 17 *RCS CKS
 SM RCS Monit Ck pg F/10-1
 CM RCS Monit Ck pg F/10-1
- 18 *C&W SYS CK pg F/10-15
- 19 *CMC SELF CK pg F/2-2
- 20 *DSKY COND LT TEST pg F/8-1
- 21 -03:45h MIDCOURSE MANEUVER
 P30 - EXT ΔV
-03:15h P40/41 - SPS/RCS THRUSTING
-03:00h MIDCOURSE (#7) BURN
 Key V66E
- 02:00h *LOGIC SEQUENCE CK
 (8) cb SECS LOGIC (2) - close (verify)
 cb SECS ARM (2) - close
 cb ELS (2) - close
 ELS LOGIC - on (up)
 ELS - AUTO
 Coordinate next 3 steps with MSFN
 SECS LOGIC (2) - on (up)
 MSFN confirm GO for PYRO ARM as req'd
 SECS LOGIC (2) - OFF
 cb SECS ARM (2) - open
 ELS LOGIC - OFF
 ELS - MAN
 cb ELS (2) - open
- 22 NO COMM NAV SIGHTINGS
- 23 OMNI - C
 MNVR TO SUPERCIRCULAR ENTRY ATT _____ ° PITCH
 V62E
- 23A V49E
- 23B F 06 22 DESIRED FINAL GMBL ANGLES (.01°)
 LOAD ENTRY ATT PAD ANGLES
 PRO

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CSM 1 Subs

23C 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 23E

23D 06 18 AUTO MNVR TO FDAI RPY ANGLES (.01°)

23E F 50 18 REQUEST TRIM (.01°)
 (TRIM) Go to 23C
 (BYPASS) ENTR

SBD ANT - OMNI C

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

V41 N91E

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

41 OPTICS DRIVE

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

25 -01:35h *P52 - IMU REALIGN pg F/6-2 (OPTION 3)
 Record gyro torquing angles

R _____

P _____

Y _____

If $>1^\circ$, recycle P52

If confirmed, use SCS for EMS entry
 OPTICS PWR - OFF

26(____:____:____) *GDC ALIGN
 If drift $>10^\circ/\text{hr}$, change rate source

Change Date April 15, 1969
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CSM 107 & Subs

27 -01:15h

*EMS ENTRY CHECK

EMS FUNC - OFF

(8) cb EMS (2) - close

EMS MODE - STBY

EMS FUNC - EMS TEST 1 (wait 5 sec)

EMS MODE - NORMAL (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 nm₀^{+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}^{+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}^{+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}^{+0.1}

EMS MODE - STBY

28

*EMS ΔV TEST (DEORBIT ONLY)

EMS FUNCT - ΔV SET/VHF RNG

Set ΔV ind to 1586.8 fps

EMS MODE - NORMAL

EMS FUNCT - ΔV TEST

SPS THRUST lt - on/off (10 sec)

ΔV ind stops at - 0.1 to -41.5

EMS MODE - STBY

29

*PRIMARY WATER EVAP ACTIVATION

GLY EVAP H2O FLOW - AUTO
 GLY EVAP STM PRESS - AUTO
 PRI ECS GLY PUMP - AC1

~~(300) PRI GLY TO RAD vlv BYPASS (pull)~~

30

*SEC WATER EVAP ACTIVATION (if NO cold soak)

ECS IND sel - SEC
 SEC COOL LOOP PUMP - AC2
 GLY DISCH SEC PRESS - 39-51 psig
 SEC COOL LOOP EVAP - EVAP
 SEC GLY EVAP OUT TEMP - 40 - 50.5°F
 SUIT CKT HT EXCH - BYPASS 20 sec, OFF
 ECS IND sel - PRIM

31

-01:10h *CM RCS PREHEAT

Note: If sys test mtr 5c,d,6a,b,c,d all read 3.9 vdc (28°F) or more, omit preheat

- (8) cb RCS LOGIC (2) - close
 CM RCS LOGIC - on(up)
 UP TLM CM - BLOCK (verify)
- (8) cb CM RCS HTRS (2) - close
- (101) CM RCS HTRS - ON (LMP Confirm)
 (20 min or til lowest rdg is 3.9 vdc) (Monitor Manf press for press drop)

32

*FINAL STOWAGE

OPTICS (except for deorbits)
 ORDEAL

- (377) GLY TO RAD SEC vlv - BYPASS (verify)
 Verify COUCH STRUT disengaged
- (382) Cool pn1 installed
 Y-Y struts (2) extended
 Stow Data Box R-12
 Attach both strut unlock lanyards

CHECK FOR WATER
 IN TUNNEL AREA

33 -00:50m

*TERM. CM RCS PREHEAT

- UP TLM CM - BLOCK (verify)
- (101) CM RCS HTRS - OFF
 CM RCS LOGIC - OFF
- (8) cb CM RCS HTR (2) - open

34

*SYSTEMS TEST PANEL CONFIGURATION

SYS TEST METER - 4B (BAT RLY BUS
 3.4-4.1 vdc)

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CSM 101 SUBS

2. SUPERCIRC ENTRY

7. ENTRY EMERG

LUNAR ENTRY PAD

E
1-6

- (101) CM RCS HTRS - OFF (verify)
 WASTE H₂O DUMP HTR - OFF
 (101) URINE DUMP HTR - OFF
- 35 (100) LEB FLOOD & INTGL LIGHTING - OFF

- 36 *PYRO BATT CK
- (250) CB PYRO A SEQ A - close (verify)
 CB PRYD B SEQ B - close (verify)
 DC IND - PYRO BAT A(B)
 *If PYRO BAT A(B) < 35 vdc *
- (250) *cb PYRO A(B) seq A(B) - open*
- ~~cb~~ *PYRO A(B)BAT BUS A(B)TO PYRO*
 * ~~BUS TIE~~ - close *
- (275) cb MNA BAT C - close
 cb MNB BAT C - close
 DC IND - MNB
 PNL 8 - All cb's closed except:
 EDS BAT (3) - open (verify)
 PL VENT - open (verify)
 FLOAT BAG (3) - open (verify)
 SPS P&Y (4) - open (verify)
 CM RCS HTRS (2) - open (verify)
 DOCKING PROBE (2) - open (verify)
 DIRECT ULLAGE (2) - open

- 37 (____:____:____) *FINAL GDC DRIFT CK (If req'd)
 If drift >10°/hr, Suspect GDC. Do not
 use RSI & FDAI #2

- 38 *CM RCS ACTIVATION
- (8) SECS LOGIC (2) - on(up)
 MSFN confirm GO for PYRO ARM(if poss)
 SECS PYRO ARM (2) - ARM
 CM RCS PRPLNT 1&2 - ON
 CM RCS PRESS - ON

E
1-7/8

RCS IND sw - CM1, then 2
He PRESS stabilizes at 3300 - 3500
psia after 15 minutes
MANF PRESS 287-302 psia
SECS PYRO ARM (2) - SAFE

39 -00:45m

P27 & ENTRY PAD UPDATE

SUPERCIRCULAR ENTRY, pg E/2-1
SPS DEORBIT , pg E/4-1
SM RCS/HYBRID DEORBIT, pg E/3-1

LUNAR ENTRY PAD

2. SUPERCIRC ENTRY

7. ENTRY EMERG

Change date 16, 1969
Basic Date 15, 1969

CSM 100 § Subs

DATA FILE

1-28

0000 - 0000 - 0000 - 0000 - 0000
0000 - 0000 - 0000 - 0000 - 0000
0000 - 0000 - 0000 - 0000 - 0000
0000 - 0000 - 0000 - 0000 - 0000
0000 - 0000 - 0000 - 0000 - 0000

0000 - 0000 - 0000 - 0000 - 0000
0000 - 0000 - 0000 - 0000 - 0000

0000 - 0000 - 0000 - 0000 - 0000
0000 - 0000 - 0000 - 0000 - 0000
0000 - 0000 - 0000 - 0000 - 0000

DATA FILE

Basic Date Jul 5, 1969 Rev I
Changed

E/1-13

LUNAR ENTRY

X	X	X			
X	X	X			
X	X	X			
			•	•	
X	X	X			
0			•		
			•		
X	X	X			•
+					
-	0	0		•	
+					
+					•
			•	•	
X	X				
+	0	0		•	
+	0	0		•	
+					
+					
X	X	X			
X	X				
X	X				
X	X				
X	X				
X	X	X	X		
+					0
+					0 0
X	X	X			
X	X				
X	X	X			
X	X	X			
X	X	X			
X	X	X			
X	X	X	X		

					AREA
X	X	X			R 0.05 G
X	X	X			P 0.05 G
X	X	X			Y 0.05 G
			•	•	GET HOR
					CK
X	X	X			P
0			•		LAT N61
			•		LONG
X	X	X			MAX G
+					V _{400K} ^{N60}
-	0	0		•	Y _{400K}
+					RTGO EMS
+					VIO
			•	•	RRT
X	X				RET 0.05 G
+	0	0		•	DL MAX
+	0	0		•	N69
+	0	0		•	DL MIN
+					V _L MAX
+					VL MIN
X	X	X		•	DO
X	X			•	RET V _{CIRC}
X	X			•	RETBBO
X	X			•	RETEBO
X	X			•	RETDRO
X	X	X	X		SXTS
+				0	SFT
+				0 0	TRN
X	X	X			BSS
X	X				SPA
X	X	X			SXP
X	X	X	X		LIFT VECTOR

LUNAR ENTRY PAD

2. SUPER CIRC ENTRY

7 ENTRV TMEDC

LUNAR ENTRY PAD

E/1-14

X	X	X
X	X	X
X	X	X
X	X	X
	0	
X	X	X
+		
+	-	0
+		0
+		
X	X	
+	0	0
+	0	0
+		
X	X	
X	X	
X	X	
X	X	
X	X	
X	X	X X
+		0
+		0 0
X	X	
X	X	
X	X	
X	X	
X	X	

X	X	X
X	X	X
X	X	X
X	X	X
X	X	
	0	
X	X	
+		
+	-	0
+		0
+		
X	X	
+	0	0
+	0	0
+		
X	X	
X	X	
X	X	
X	X	
X	X	
X	X	X X X X
+		0
+		0 0
X	X	
X	X	
X	X	
X	X	
X	X	

Basic Date _____
Changed _____

11 15 1060

AREA
R 0.05 G
P 0.05 G
Y 0.05 G
GET HOR
P CK
LAT N61
LONG
MAX G
V 400K N60
γ 400K
RTGO EMS
VIO
RRT
RET 0.05 G
DL MAX N69
DL MIN
VL MAX
VL MIN
Do
RET VCIRC
RETBBO
RETERO
RETDRO
SXTS
SFT
TRN
BSS
SPA
SXP
LIFT VECTOR

Changed _____
Basic Date April 15, 1969
Changed the 27, 1969

CSM 07 & Subs

E

2-1

SECTION 2. SUPERCIRCULAR ENTRY

1

Set DET (up, to EI)

2

EMS INITIALIZATION

- * Scroll not on 37K: *
- * EMS FUNCT - TEST 5 *
- * Slew scroll to 37K *

EMS FUNCT - RNG SET

EMS MODE - NORMAL

SET RNG TO PAD DATA RNG

EMS FUNC - Vo SET

Slew Scroll to Pad Data VIO
Do not go thru TEST 3 or 5

EMS MODE - STBY ~~(up)~~

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

Align GDC to IMU

4

CM RCS CHECK

AUTO RCS A/C ROLL (4) - OFF (Verify)

(8) cb RCS LOGIC (2)-close (verify)

SC CONT - SCS

RCS TRANSFER - CM

AUTO RCS SEL (RING 1) - OFF

AUTO RCS SEL (RING 2) - MNB

TEST RING 2 THRUSTERS

AUTO RCS SEL (RING 2) - OFF

AUTO RCS SEL (RING 1) - MNA

TEST RING 1 THRUSTERS

AUTO RCS SEL (RING 2) - MNB

RCS TRANS - SM

5 30:00m
(-30:00)

MN BUS TIE (2) - ON

TAPE RCDR - REWIND

E
2-2

- 6 35:00m SEPARATION CK LIST
 (-25:00) (8) cb ELS BAT (2) - close (verify)
 (326) REPRESS PKG vlv - FILL
 O2 SM SUPPLY vlv - OFF
 SURGE TK - ON (verify)
 REPRESS PKG vlv - ON
 (325) CAB PRESS REL vlv (2) - NORM
 ABORT SYS PRPLNT - RCS CMD (verify)
 SM RCS SEC PRPLNT FUEL PRESS (4)-OPEN
 VHF AM A&B - off (ctr)
 HI GAIN ANT PWR - OFF
 (5) FC PUMPS (3) - OFF
 FC 2 MN A&B - OFF
 Verify Loads Balanced
 S BD PWR AMP - LOW
 S BD ANT OMNI - best
 (5) cb ECS RAD CONT/HTR (2) - open
 cb WASTE H2O/URINE DUMP HTR (2) - open
 cb RAD HTRS OVLD (2) - open
 POT H2O HTR - OFF
 GLY EVAP TEMP IN - MAN

(380) PRI GLY TO RAD vlv - BYPASS (PULL)MNVR TO CM/SM SEP R,P,Y ATT

SC CONT - SCS
 CMC MODE - FREE
 MNVR TO PAD ATT
 R _____ (0°)
 P _____ (265°)
 Y _____ (0°)

7

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

1 V37E 61E

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

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

3 F 06 60 GMAX, V400K, GAMMA EI (.01G, fps, .01°)

CSM 10 Subs

Basic Date April 15, 1969
 Changed June 27, 1969

Changed
Basic Date April 15, 1969
Changed
Subs CSM 107 &
S

E
2-3

Record
GMAX _____
V400K _____
GAMMA EI _____
PRO

4 F 06 63 RTOGO (.1nm) _____ PAD _____
VIO (fps) _____ PAD _____
TFE(min-sec) _____
If NO COMM, Set RTOGO & VIO in EMS
& initialize
(ACCEPT) PRO
(UPDATE TFE) V32E to 4

P62 - CM/SM SEP & PRE-ENTRY MNVR

5 F 50 25 00041 REQUEST CM/SM SEP
SC CONT - SCS/FREE
43:00m COMPARE PITCH ATT WITH PAD DATA
(within 5°)
(-17:00) If not $+5^\circ$, G&N NO GO
YAW - 45° OUT-OF-PLANE (LEFT) (315°)
RATE-HIGH
ATT DB-MIN
MAN ATT(3)-RATE CMD
BMAG MODE (3) - ATT1/RATE 2
MN BUS TIE (2) - ON (verify)
PRIM GLY TO RAD - BYPASS (verify)
EMS MODE-STBY (verify)
CM RCS LOGIC - on (up)
SECS LOGIC (2)-on(up)(verify)
SECS PYRO ARM (2) - on (up)
CM/SM SEP (2) - ON
45:00m (-15:00) If docking ring still on:
CSM/LM FNL SEP (2) - on(up)(verify)
MAN ATT (3) - MIN IMP
BMAG MODE (3) - RATE 2
C&W MODE - CM
(258°P) RCS TRNFR - CM
CM RCS MANF PRESS - 287-302 psia
CM RCS LOGIC - OFF
SECS PYRO ARM (2)-SAFE

6. EARTH/POST I.D.C

7. ENTRY EMERG

Monitor VMA/B:

If <25 vdc go to EMERG
POWERDOWN pg E/7-1

50:00m AUTO RCS SEL A/C ROLL (4) - OFF

(-10:00) AUTO RCS SEL CM 2(6)-OFF

(236°P) AUTO RCS SEL CM 1(6)-MNA

YAW back to 0°

PITCH TO HORIZ TRACK ATT
ROLL - 0° (LIFT UP)

PITCH - 400K Horiz Mark (31.7°)

YAW - 0°

ATT DB - MAX

EMS DATA - Verify

EMS FUNC - ENTRY (verify)

EMS MODE - NORMAL

MAINT HORIZ TRK

MAN ATT (3) - RATE CMD

PRO (Act ENTRY DAP)

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

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

P63 - ENTRY INIT

8 06 64 G, VI, RTOGO (.01G, fps, .1nm)

FDAI SCALE - 5/5

ROT CONTR PWR DIR (2) - MNA/MNB

TAPE RCDR - HBR/FWD

HORIZ CHECK

Pitch error needle goes toward
zero approaching .05G time

If CMC is GO:

SC CONT - CMC/AUTO

* If DAP NO GO: *

* SC CONT - SCS *

* FLY BETA *

* If CMC NO GO: *

* SC CONT - SCS *

* FLY EMS *

CSM 10 Subs

Basic Date April 15, 1969
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Basic Date April 18, 1969
Changed June 1, 1969

CSM 107 & Sabs

E
2-5

P64 - ENTRY POST .05G
(If no P64 at .05G +5 sec, GNCS NO GO)

9 (158°P) AT 400K' RTOGO AT .05G AGREES WITH EMS-verify
(RRT=0:00) HORIZ CHECK
.05G lt - on (EMS START)

.05G time
(+0 : :) * No EMS START within 3 sec: *
(: : :) * EMS MODE - BACKUP/VHF RNG *

(152°) AT .05 G .05G sw - on (up)
06 74 BETA, VI, G EMS ROLL - on (up) (.01°, fps, .01G)
NOTE: To monitor N68,
Key V16 N68E
Compare RSI & FDAI
If CMC or PAD cmds Lift DN,
MNVR Lift DN
EMS GO/NO GO
G-V Plot within limits
Monitor G-meter for
convergence with pad data (Do)
CMC is NO GO if commanding constant
90° command when g < 5.4
Go to 13 (P67)
or continue

P65 - ENTRY - UP CONT (VL>18K fps)

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

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

PRO

11 06 74 BETA, VI, G (.01°, fps, .01G)
(V<VL+500 fps & RDOT Neg) Go to 13

6. EARTH/POST LDG

7. ENTRY EMERG

E
2-6P66 - ENTRY - BALLISTIC (D<DL)

12 06 22 DESIRED GMBL ANGLES RPY (.01°)
 Monitor horiz $\pm 12^\circ$ of 31.7° mark

P67 - ENTRY - FINAL PHASE (AUTO AT .2G)

13 06 66 BETA, CRSRNG ERR, DNRNG ERR (.01°, .1nm, .1nm)
 BETA will be $\pm 15^\circ$ until DN RNG ERR <-9nm
 Monitor lift vector on RSI & FDAI
 CM RCS: change rings when HE PRESS <1150 psia

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

SC CONT - SCS
 RTOGO NEG - LIFT UP
 RTOGO POS - LIFT DOWN
 Monitor altimeter
 Record LAT, LONG & VOICE TO RECY at 10K'
 Record EMS RTGO
 EMS MODE - STBY
 EMS FUNCT - OFF

Go To EARTH LANDING pg E/6-1

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SECTION 6. EARTH/POST LANDING

07:20

~~36~~

RRT (06:52)

50K' (07:52)

~~32~~

08:16

Start watch

STEAM PRESS - pegged at 90K(0:00)

CABIN PRESS REL vlv (2) - BOOST/ENTRY(~~01:00~~)

SECS PYRO ARM (2) - ARM

00:56

40K' (08:07)

~~07:46~~

08:30

* CM UNSTABLE

(01:~~15~~) *

*RCS CMD - OFF

*

* 40K' APEX COVER JETT PB-PUSH *

DROGUE DEPLOY PB - PUSH (2 sec)

*after apex cover jett)

10

30K' ELS LOGIC - on (up)

ELS - AUTO

09:02

24K' (08:30) RCS disable (auto)

(01:~~15~~)

~~15~~ *RCS CMD - OFF*

42

Apex cover jett (auto)

APEX COVER JETT PB - PUSH

(WAIT 2 SECS)

Drogue parachutes deployed (auto)

DROGUE DEPLOY PB - PUSH

If Both Drogues Fail:

*ELS - MAN *

*Stabilize CM *

5K' MAIN DPLY PB - PUSH

*ELS - AUTO *

23.5K' Cabin Pressure increasing (Drogues + 50s)

*If not increasing by 17K': *

CABIN PRESS REL vlv (RH) - DUMP

09:51

~~07~~

10K' (09:52) Main parachutes deployed (02:31)

MAIN DEPLOY PB - PUSH (within 1 sec)

VHF ANT - RECY

VHF AM A - SIMPLEX

VHF BCN - ON

DIRECT O2 - ON (if suited)

SURGE TANK VALVE OFF

REPRESS PKG VACUUM-OFF
DIRECT O2 VALVE - OPEN FULL

6. EARTH/POST LDG

7. ENTRY EMERG

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CABIN PRESS REL vlv (2) - CLOSE
 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 (2) - 30 secs *

* NO PITCH *

STRUT LOCKS (4) - UNLOCK

If night landing:

(8) cb FLOAT BAG #3, FLT/PL (1 cb)-close
 PL BCN LT - HIGH

(275) cb FLT & PL BAT BUS A,B,&BAT C (3)-close
 cb FLT & PL MNA & B (2) - open

(5) cb RAD HTR OVLD (2) - open (verify)

(8) cb SPS P&Y (4) - open (verify)

(5) cb BAT RELAY BUS (2) - open

3K' CABIN PRESS REL vlv (RH) - DUMP (after purge
 ELS-AUTO (verify) completed)
 ELS LOGIC-ON (verify)
 FLOOD Lts - POST LDG
 CM RCS PRPLNT (2) - OFF

800' CAB PRESS RELF vlv - CLOSE (latch off)
 MN BUS TIE (2) - OFF

POSTLANDING

STABILIZATION, VENTILATION, COMMUNICATIONS

1 Stabilization after landing

(229) cb MAIN REL PYRO (2) - close

MAIN RELEASE - on (up)

SECS PYRO ARM (2) - SAFE

SECS LOGIC (2) - OFF

~~DIRECT O2 - OFF (verify)~~

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- *No contact with recovery forces*
- *VHF AM A&B - off (ctr) *
- *VHF AM RCV ONLY - A *
- (8) cb PL VENT - close
- cb FLOAT BAG (3) - close
- (278) cb UPRIGHT SYS COMPRESS (2) - close
- If Stable II:
FLOAT BAG(3)-FILL till 2 min after upright, then - OFF
VHF AM A/B & BCN - OFF while inverted
- If Stable I:
After 10 Min Cooling Period,
FLOAT BAG (3) - FILL 7 min, then OFF

2

Post Stabilization And Ventilation

- (15) PL BCN LT - BCN LT LOW
PL VENT vlv - UNLOCK (Pull)
Remove PL VENT Exh Cover
- (15) PL VENT - HIGH or LOW
PL DYE MARKER - ON (swimmer comm)
Release footstraps and restraints
- (275) cb MNA BAT BUS A & BAT C (2) - open
cb MNB BAT BUS B & BAT C (2) - open
cb FLT & PL BAT C - open
- (250) cb PYRO A SEQ A - open
cb PYRO B SEQ B - open
*EACH HR - CHECK DC VOLTS \geq 27.5 V *
- If Not:
*(275) * cb FLT & PL-BAT BUS A&B (2) -open*
* cb FLT & PL BAT C (1) - close *
* GO TO LOW POWER CHECKLIST *
- Unstow and install PLV DISTRIB DUCT
Deploy grappling hook and line if req.

EGRESS PROCEDURES

- | | |
|-----|-------------------------|
| CMP | PL VENT - OFF (15) |
| LMP | cb Pnl 250 (all) - open |

STABLE I

- ALL Disconnect umbilicals
- Neck dam on (if suited)
- CMP Center couch - 270° position

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7. ENTRY EMRG

CDR, LMP Armrests stowed
 CDR Connect raft to S/C, if desired, with green lanyard
 Connect raft white lanyards to suits
 inflate water wings when exiting
 CMP GN2 RATCHET HNDL - CW
 GN2 VLV HNDL - UNLATCH & PUSH (Outbd)
 Side Hatch opened
 ACTR HNDL SEL - N
 Egress with liferaft
 LMP Put hardware kit out
 LMP, CDR Egress

or C. STABLE II

LMP cb CREW STA AUDIO (3) - open
 ALL Disconnect umbilicals
 Couch seat pans (3) - 170° position
 Neck dam on (if suited)
 CMP Arm rests stowed
 Survival kits removed from stowage
 CDR Connect life raft mainline to CDR or S/C
 CMP Connect first raft white lanyard to suit
 CDR Connect third raft white lanyard to suit
 CMP PRESSURE EQUALIZATION vlv - OPEN
 CMP, LMP Remove and stow 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

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

VHF AM B Rcvr and/or Survival Transceiver

*VHF Beacon not operating *

connect Survival Transceiver to ant

cable behind VHF ant access pnl and

*place radio in BCN mode *

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LOW POWER CHECKLIST

VHF BCN - OFF
VHF AM (3) - RCV
FLOOD LTS - OFF
VHF AM A&B - off (ctr)
VHF AM RCV ONLY - A (verify)
COUCH LIGHTS - OFF
POSTLANDING VENT SYS: minimize use
SURV RADIO - plug into VHF BCN ANT cable
conn behind VHF ant access pnl & turn
radio on in BCN mode

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7. ENTRY EMERG

LUNAR ENTRY PAD

EARTH/POST LDG

8-210

FOR NUMBER CHARTER

AIR BOX - QTB

700 - 27300000

300 - 27300000

100 - 27300000

(100) - 27300000

100 - 27300000

100 - 27300000

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SECTION 7. ENTRY EMERGENCY PROCEDURES

CM RCS FAILS TO PRESSURIZE OR FEED PRPLNT

1. Verify electrical power for pressurization
 - cb EPS BAT BUS (2) - close (Pn1 229)
 - cb PYRO A/B SEQ A/B (2) - close (Pn1 250)
 - cb SECS ARM (2) - close (Pn1 8)
 - SECS PYRO ARM (2) - ARM
 - SECS LOGIC (2) - on (up)
2. Cycle CM RCS - PRESS (Pn1 2)
3. Verify electrical power to CM RCS prplnt vlv
 - cb EPS GRP 1&3 - close (Pn1 229)
 - cb SM RCS HTR A&B - close (Pn1 8)
 - cb RCS PRPLNT ISOL (2) - close
4. Cycle CM RCS PRPLNT 1&2 - on (up) (Pn1 2)
5. Open He & PRPLNT Crossfeed
 - cb EPS GRP 5 - close (Pn1 229)
 - cb RCS LOGIC (2) - close (Pn1 8)
 - CM RCS LOGIC - on (up) (Pn1 1)
 - CM PRPLNT - DUMP (momentarily, then OFF)

EMERGENCY POWERDOWN

(MN BUS voltage <26.0 vdc, no short verified)

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	Amps
S BD PWR AMP - off (ctr)	4.35
SEC COOL EVAP - RESET for 58 sec, then OFF	4.26
SEC COOL PUMP - OFF	
SUIT COMPR (2) - OFF	8.44
DIRECT O2 vlv - ON (if suited)	
TAPE RCDR FWD - off (ctr)	1.69
POT H2O HTR - OFF	1.62
LIGHTS - (min req'd)	
cb G&N OPT (2) - open	3.1
ECS GLY PUMPS (2) - OFF	2.76 per pump
PWR SCE - off (ctr)	0.70
TELECOM GRP 1&2 - OFF	1.8
cb INSTR ESS (2) - open	1.10

Note: After 0.05G, cb G&N (all 10) - open

BUS LOST RECONFIGURATION

- A. Loss of MN BUS A
FC 2 - MNB only
FC 1 (MNA&B) - off (ctr) (on line
for deorbit burn)
INV 3 - MNB, AC1
cb MNA BAT BUS A - open
cb MNA BAT C - open
cb MNB BAT C - closed
cb BAT C BAT BUS A - closed
AUTO RCS SEL (desired thrusters) - MNB
FDAI SEL - 2
RHC PWR DIR (2) - MNB
BMAG MODE (3) - RATE 2
- B. Loss of MN BUS B
FC 2 - MNA only
FC 3 (MNA&B) - off (ctr)(on line for
deorbit burn)
INV 3 - MNA, AC2
cb MNB BAT C - open
cb MNB BAT BUS B - open
cb BAT C BAT BUS B - closed
cb MNA BAT C - closed
AUTO RCS SEL (desired thrusters) - MNA
FDAI SEL - 1
RHC PWR DIR 1 - MNA
SCS ELEC PWR - ECA
BMAG MODE (3) - RATE 1
- C. Loss of BAT BUS A
Prepare for two battery entry
AUTO RCS SEL (desired thrusters) - MNB
After CM/SM SEP
 RCS TRNFR - CM (mom)
At APEX COVER JETT
 cb SCS CONTR/AUTO (2) - open
- D. Loss of BAT BUS B
Prepare for two battery entry
AUTO RCS SEL (desired thrusters) - MNA

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After CM/SM SEP
RCS TRNFR - CM (mom)
At APEX COVER JETT
cb SCS CONTR/AUTO (2) - open

E. Loss of AC BUS 1

AC INV 1 MNA - OFF
BMAG MODE (3) - RATE 2
FDAI SEL - 2
SUIT COMPR 2 - AC2
S BD NORM XPNDR - SEC
S BD NORM PWR AMP - SEC
ECS GLY PUMP 2 - AC 2
G&N PWR - AC2

F. Loss of AC BUS 2

AC INV 2 MNB - OFF
FC PUMP 2&3 - AC1
FDAI SEL - 1
BMAG MODE (3) - RATE 1
G/N PWR - AC1
S BD NORM XPNDR - PRI
S BD NORM PWR AMP - PRI

EMERGENCY SAFE OF APEX COVER JETT

If MSFN NO GO For Pyro Arm Indicates Apex Cover Jettison,

SECS LOGIC (2) - OFF
cb ELS (2) - open
SECS LOGIC (2) - ON

If MSFN GO, Go To Step A

If Still Apex Cover Jettison,
cb SECS LOGIC A - open

If MSFN GO, Go To Step B

If Still Apex Cover Jettison,
cb SECS LOGIC A - close
cb SECS LOGIC B - open

If MSFN GO, Go To Step C

If Still Apex Cover Jettison,
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 (Pn1 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 Jettison Apex Cover At 24K':

SECS PYRO ARM (B) - ARM

STEP A

cb ELS (2) - open (verify), close
at or after apex cover jettison
at 24K'

Continue normal entry

STEP B

cb SECS LOGIC A - open (verify),
close at or after apex cover jettison
at 24K'

Continue normal entry

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STEP C

cb SECS LOGIC B - open (verify), close
at or after apex cover jettison
at 24K'

Continue normal entry

FIRE/SMOKE IN CM DURING ENTRY

WARNING: CM water must not be used
to extinguish fire

- 1 CABIN FAN (2) - OFF (verify)
- 2 Monitor EPS indicators for excessive current.
Immediately remove power from affected bus.
- 3 ROT CONTR PWR DIRECT (2) - 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 (up)
Set up for CM/RCS sys 2
AUTO RCS SEL A/C ROLL (4) - OFF
AUTO RCS SEL CM 1(6) - OFF
AUTO RCS SEL CM 2(6) - MNB
RCS dump is fuel rich
 - MNB
AC INV 2 AC BUS 2 - OFF
AC INV 1 AC BUS 2 - on (up)
RCS dump is oxidizer rich
- 5 CAB PRESS REL vlv (RH) - DUMP
- 6 Continue ENTRY

LUNAR ENTRY PAD

7 ENTRV FMFRG

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LUNAR ENTRY PAD

7 ENTR Y F M E R C

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LUNAR ENTRY PAD

7 ENTR Y EMERG

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LUNAR ENTRY PAD

7 - ENTR Y EMERG

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TIME	REMARKS	TIME

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LUNAR ENTRY PAD

7. ENTRY EMERG

TIME	REMARKS

Basic Date _____
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Basic Date _____

LUNAR ENTRY PAD

FADTU / DOCUMENT TWO

ENTRY FORM NO. 7

TIME	REMARKS

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