Basic Date Feb. 1, 1969
Changed

ENTRY OPERATIONS

ENTRY OPERATIONS

SECTION 1 VEHICLE PREPARATION

SC POWER UP

SCS

CB PANEL 8 (NC)-closed
SC CONT - CMC
ΔV CG - as required
LOGIC PWR 2/3 - on (up)
SIG COND/DRIVER BIAS PWR (2) - AC1
SCS ELEC PWR - GDC/ECA (170 watts)
BMAG TEMP lt(2)-out(verify)
FDAI PWR - OFF
BMAG PWR (2) - ON (110 watts)
FDAI PWR - BOTH (104 watts)
AUTO RCS SELECT (16) - MNB
ROT CONT PWR NORMAL (2)-AC/DC

CMC

PRO (Hold until STBY lt out)
PROG,RESTART,TRACKER,CMC,ISS,PGNS,13777
F37-00E
RSET-CMC, RESTART out

IMU

1 Verify: LOGIC PWR 2/3 - ON
FDAI POWER - BOTH
FDAI SELECT - 1/2
CMC MODE - FREE

2 G/N IMU PWR - On
NO ATT lt - on (90 sec), TRACKER - off
NO ATT lt - out
RSET - PROG,ISS,PGNS out
Wait 20 sec

3 V37E 00E

SYSTEMS CHECKS

1 CMC SELF CHECK
2 DSKY LAMP TEST, V35
3 DAP ACTIVATION, V48,V46
4 ERASABLE DUMP, V74E
5 IN PLANE GDC ALIGN
6 FUEL CELL 02 PURGE (2:00)

CMP 3-9 (PG-70)

CMP 8-1 (PG-84)

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969
CSM 104

7 CRYO O2 & H2 FANS ON (3:00)
8 WASTE H2O DUMP (if QTY will be >85% at end of day)
9 CO2 CANISTER CHANGE
10 Activate Primary Evaporator
11 Obtain Consumables update from MSFN
12 VERIFY EVA STABILIZER STRUT DISCONNECTED

CMC SELF CHECK

1 V25 NO1E, 1365E
F 21 01 E,E,E

2 V15 NO1E, 1365E
F 15 01 R1 NUMBER OF ERRORS
R2 NUMBER OF TESTS STARTED
R3 NUMBER OF TESTS SUCCESSFUL

3 V21 N27E 10E SELF TEST, FIXED & ERASABLE
(4E SELF CHECKS ERASABLE
5E SELF CHECKS FIXED)

4 KEY RLSE
F 15 01 TEST SUCCESSFUL WHEN R2]3 (78 sec)
* IF PROG lt - on *
* V05 N09E 01102 SELF *
* TEST ERROR *
(TERM) V21 N27E 0E NO8-RCD FOR MSFN

IN-PLANE GDC ALIGNMENT
CMC - on
ISS - on
SCS - operating

1 V37E 52E
F 04 06 00001
Load R2-00002
PRO

2 F 06 34 GET ALIGN 0,0,0
PRO

3 F 06 22 R,P,Y

4 Set ATT SET dials to R,P,Y on DSKY

Basic Date Feb 1, 1969
Changed Feb. 20, 1969
CSM 104

5		FDAI SELECT - 1 ATT SET - GDC GDC ALIGN - push
6	V37E XXE	

CABIN COLD SOAK, LMP/2-11(CREW OPTION)

P51 - IMU ORIENTATION

BMAG MODE (3) - RATE 2
G/N PWR OPTICS - on
OPT ZERO - ZERO
OPT MODE - MAN

1	V37E 51E	
	F 50 25	00015 MNVR TO ACQ STARS (Coarse Align IMU To 0,0,0) - ENTR to 2 (BYPASS) PRO to 3
2	41 22	DESIRED GIMBAL ANGLES (0,0,0) NO ATT lt - on then off, to 1
3	F 51	PLEASE MARK OPT ZERO - OFF MARK
4	F 50 25	00016 TERMINATE MARKS PRO
5	F 01 71	0OODE STAR CODE Load desired code PRO to 3 after 1st MARK (to 6 if DE=00) to 7 after 2nd MARK (to 6 if DE=00)
6	F 06 88	CELESTIAL BODY VECTOR Load desired vector PRO to 3 after 1st MARK to 7 after 2nd MARK

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

P51

7 F 06 05 STAR ANGLE DIFFERENCE (.01°)
(RECYCLE) V32E to 1
(ACCEPT) PRO

8 F 37 XXE-OPT ZERO - ZERO

MNVR to DEORBIT ATT (approx)

INITIAL VEHICLE PREPARATION

T ECS CHECKS

A. O2 REPRESS BOTTLES REFILL (if necessary)
SURGE TK - ON
O2 PRESS IND sw - SURGE TANK

O2 PLSS vlv - FILL
O2 PRESS -> 865 psia
O2 PLSS vlv - OFF

B. PGA VERIFICATION CHECK(5.0 psia CAB PRESS)(If suited)
DIRECT O2 vlv - close (CW)
SUIT PRESS ind - 4.7-5.3 psia
O2 FLOW ind - 0.2-0.4 lb/hr
SUIT TEST vlv - PRESS
O2 FLOW ind - >1.0 lb/hr
O2 FLOW HI lt - on
MASTER ALARM pb/lt (3) - on, push
SUIT PRESS ind - 8.9-9.5 psia
PGA press ind (3) - 4.1-4.5 psig
O2 DEMAND REG vlv - OFF
O2 FLOW ind - <0.2 lb/hr
O2 FLOW HI lt - OFF
PGA press ind (3) - 0.5 psi/min
pressure decay
O2 DEMAND REG vlv - BOTH
SUIT TEST vlv - DEPRESS
O2 FLOW ind - 0.2-0.4 lb/hr
SUIT PRESS ind - slightly
CAB PRESS ind
SUIT TEST vlv - OFF

Basic Date Dec. 1, 1969
Changed Feb. 20, 1969

C. ECS MONITORING CHECK
SUIT CAB ΔP ind - -1.0 to -3.5 in. H2O
O2 FLOW ind - 0.2-0.45 lb/hr
O2 PRESS IND sw - SURGE TANK
CRYO TK 1 O2 PRESS ind - 865-935 psia
O2 PRESS IND sw - TANK 1
ECS RAD tb - gray
ECS IND sel - PRIM
ECS RAD PRIM IN TEMP ind 67-97° F
ECS RAD PRIM OUT TEMP ind -
-20 to +63° F
GLY EVAP PRIM OUT TEMP ind - 40-50.5° F
GLY EVAP PRIM STM PRESS ind -
0.10-0.15 psia (when boiling)
>0.16 psia (not boiling)
GLY DISCH PRIM PRESS ind - 40-52 psig
SUIT TEMP ind - 45-55° F
CAB TEMP ind - 70-80° F
SUIT PRESS ind - CAB PRESS
CAB PRESS ind - 4.7-5.3 psia
PART CO2 PRESS ind - <7.6 mm Hg
SUIT COMPR ΔP ind - 0.3-0.4 psi
ACCUM PRIM QTY ind - 30-70%
If quantity<30%
PRIM ACCUM FILL vlv - ON until
40-55% is reached
POT H2O QTY - 10-100%
WASTE H2O QTY - 90%

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

2 EPS CHECKS
A. D-C VOLTAGE-AMPERAGE CHECK
MN BUS TIE (2) - OFF
FC MNA tb - 1 & 2 gray, 3 bp
FC MNB tb - 1 bp, 2 & 3 gray
FC 1, 2, & 3 (RECORD AMPS)
MAIN BUS A, B, (26.5-31 vdc-RECORD)
BAT BUS A, B, & BAT C (34-38 vdc < 3 amp)
PYRO BAT A, B (37 VDC)
DC IND sel - MNB
SYS TEST 4B (BAT RLY BUS - 3.7-4.1 vdc)

B A-C VOLTS - 113 - 117 ALL PHASES

C CRYO O2 & H2 MAN FAN OPERATION
O2 & H2 FANS - ON (sequentially for one min each)

3 SPS MONITORING CHECK
SPS PRPLNT TK TEMP - +55° to +75°F
SPS PRPLNT TK PRESS:
He - 3900 psia max.
N2A - 2900 psia max.
N2B - 2900 psia max
SPS PRESS IND sw - He
FUEL PRESS - 170-195 psia
OXID PRESS - 170-195 psia
SPS ENG INJ VLVS (4) - CLOSE
SPS OX & FUEL QTY - record
SPS OXID QTY UNBAL - record
OXID FLOW VLV - PRIM
SPS He VLV (2) - AUTO (tb-bp)

4 RCS CHECKS
A. SM RCS CK:
SM RCS PRI & SEC PRPLNT tb (8) - gray
SM RCS He 1 & 2 tb (8) - gray
SM RCS SEC PRPLNT FUEL PRESS (4) - OPEN
RCS IND sel - SM A, B, C, D
PKG TEMP - 105-195°F
He PRESS - record
MANF PRESS - 178-192 psia
He TK TEMP - record
PRPLNT QTY - record

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

B. CM RCS CK:
CM RCS PRPLNT tb (2) - bp
RCS IND sw - CM 1,2
He TEMP - 60-90°F
He PRESS - 4000-4450 psia
MANIF PRESS - 25-105 psia

P52 IMU REALIGN

BMAG MODE (3) - RATE 2
G/N PWR OPTICS - on
CMC MODE - FREE
OPT ZERO - ZERO
OPT MODE - CMC

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

1 V37E 52E
F 04 06 R1 00001 IMU ALIGN OPTION
R2 00001 PREF PRO to 4
2 NOM PRO to 2
3 REFSMMAT PRO to 5
4 LDG SITE PRO to 2

2 F 06 34 GET ALIGN (0,0,0 initially) (hr,min,sec)
Load desired GET
TO SPECIFY PRESENT TIME - PRO on (0,0,0)
PRO (NOM go to 4)

3 F 06 89 LAT, LONG/2, ALT (.001°,.001°,.01nm)
Load ldg site coords
PRO

4 F 06 22 NEW ICDU ANGLES OG, IG, MG (.01°)
(IF MG>70°, MNVR) V32E - to 4
PRO NO ATT lt - on then off

5 F 50 25 00015 STAR SELECT
(MNVR If Necessary)
(PICAPAR) PRO
*F 05 09 00405 NO PAIR *
*(CREW SPECIFY) PRO to 6 *
*(PICAPAR) V32E to 5 *

(MAN ACQ) ENTR

6 F 01 70 00ODE STAR CODE
Load desired code
OPT MODE - CMC (verify)
OPT ZERO - OFF
PRO to 8 (to 7 if DE=00)
F 05 09 00404 (TA>90°)
*MNVR - PRO to 8 *

7 F 06 88 CELESTIAL BODY VECTOR
Load desired vector
PRO
F 05 09 00404 (TA>90°)
*MNVR - PRO to 8 *

8 06 92 SHAFT, TRUN (.01°,.001°)
PROG ALARM (TA>50°)
*V5N9E 00407 *
*KEY RLSE *
*MNVR till R2<49775 *

(MARK ROUTINE) OPTICS MODE - MAN

9 F 51 PLEASE MARK
MARK

10 F 50 25 00016 TERMINATE MARKS
PRO

11 F 01 71 00ODE STAR CODE
Load code (if necessary)
PRO to 6 after 1st MARK (to 12 if DE=00)
to 13 after 2nd MARK (to 12 if DE=00)

12 F 06 88 CELESTIAL BODY VECTOR
Load vector
PRO to 6 after 1st MARK
to 13 after 2nd MARK

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

13 F 06 05 STAR ANGLE DIFFERENCE (.01°)
(REJECT) V32E to 15
(ACCEPT) PRO

14 F 06 93 TORQUING ANGLES OG, IG, MG (.001°)
(TORQUE) PRO (CMC - FREE)
(BYPASS) V32E

15 F 50 25 00014 ALIGNMENT CHECK
(RECHECK) PRO To 5
(BYPASS) ENTR

16 F 37 OPT ZERO - ZERO
XXE

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

EMS DEORBIT CHECK

EMS FUNC - OFF
CB EMS (2) - close (verify)
EMS MODE - STBY
EMS FUNC - EMS TEST 1
Wait 5 secs
EMS MODE - AUTO (wait 10 sec)
Check ind lts - off
RANGE ind - 0.0
Slew scroll until hairline is superimposed on 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 after .05G lt)
Set RANGE counter to 58 NM $\pm$ 0.0
EMS FUNC - EMS TEST 4
.05G lt - on (all others out)
G-V trace within test pattern for 10 secs then stops at lower right corner at $\approx$9g
RANGE ind counts toward zero for 10 sec, then stops at 0 $\pm$ 0.2

EMS FUNC - EMS TEST 5
.05G lt - on
RSI upper lt - on (10 sec after .05G lt)
RANGE ind - 0.0
Scribe traces vertical line 9g to
0.22 ± 0.1 and stops within test pattern
ALIGN SCROLL TO ENTRY PATTERN (on 37K ft/sec line)

EMS FUNC - RNG SET
G-V scroll assy. traces vertical line
0.22g to ± 0.1 and stops. (Trace within
EMS FUNC - $\dot{V}o$ SET test pattern)
Slew G-V scroll assy to predicted inertial
entry velocity
EMS ΔV SET
Set ΔV ind to +1586.8
EMS FUNC (CW) - ΔV Test
SPS THRUST lt - on
ΔV ind decreases (10 secs)
SPS THRUST lt - out at -0.1 on ΔV ind
ΔV ind stops at -20.8 ± 20.7 fps
EMS MODE - STBY

C&WS Operational Check
C/W LAMP TEST - 1 (LH MA & 16 lts)
C/W LAMP TEST - 2 (RH MA & 23 lts)
C/W LAMP TEST - off (center)
C/W CSM - CM (CM RCS lt(2) - on)
C/W CSM - CSM RCS lt(2) - out)
C/W PWR - OFF (C/W lt - on)
C/W PWR - 1 (C/W lt - out)

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

P30

EMS FUNCT - ΔV SET
ΔV IND - - 100 FPS

MEASUREMENT AND LOADING OF PIPA BIAS & EMS DRIFT CK

EMS FUNCT - ΔV
EMS MODE - AUTO
(allow 10 FPS/100 sec)
PIPA BIAS (ground or pg CMP /3-9

DSKY COND lt test (V35E)

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

			P30 EXTERNAL ΔV V37E 30E	
1				
	F 06 33		GETI PRO	(hrs,min,.01secs)
2	F 06 81		ΔVXYZ(LV) PRO	(.1fps)
3	F 06 42		HA,HP,ΔV(Req) SET ΔV IND PRO	(.1nm,.1nm,.1fps)
4	F 16 45		M,TFI,MGA SET DET PRO	(0,min-sec,.01°)
5	F 37		00E	

FINAL PREPARATION

-1:00 (hrs,min)

SUIT RET AIR VLV - pull (open)
EMERG CAB PRESS vlv - BOTH
CB RCS LOGIC (2) - close
CM RCS LOGIC - ON
CB CM HTRS (2) - close
UP TLM CM - BLOCK(verify before next step)
CM RCS HTRS - on for 20 min or until rdg>4.2
(Sys test 5c, d, 6a, b, c, d)
WASTE H2O DUMP-OFF
URINE DUMP HTR - OFF
CB WASTE H2O/UR DUMP (2) - open
Set RSI & REALIGN GDC
Set ORB RATE FDAI #2, Stow ORDEAL

-0:45 (min)

Dump & Rewind Tape rcdr (CRO) (MCCH)

-0:40 (min)

UP TLM-BLOCK (verify before next step)
RCS HTRS - OFF
CB PYRO A SEQ A - close (verify)
CB PYRO B SEQ B - close (verify)
Check PYRO BAT (DC VOLTS - 37.0-37.5)
DC IND sel - MNB

WARNING
If PYRO BAT A (B)<35 VDC,
CB PYRO A (B) SEQ A (B) - open
CB PYRO A (B) BAT BUS A (B) to PYRO TIE-close

CB MNA BAT C - close
CB MNB BAT C - close
Panel 8 - CB's all closed except:
PL VENT (1) & FLOAT BAGS (3) - open
CB CM HTRS (2) - open
CB EDS (3) - open
CB DOCK PROBE (2) - open

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

CM RCS ACTIVATION (MSFN contact)

CB SECS LOGIC (2) - close (verify)
CB SECS ARM (2) - close
SECS LOGIC (2) - on (up)
ELS - AUTO
ELS LOGIC - on (up)
MSFN confirm GO for PYRO ARM
ELS - MAN
ELS LOGIC - OFF
SECS PYRO ARM (2) - on (up)
CM RCS PRPLNT (2) - on(up)(2 tb gray)(Verify)
RCS IND sel - CM 1, 2
CM RCS PRESS - on (up)
  He PRESS - 3300-3750 psia
  MANIF PRESS - 287-302
CSM/LM FINAL SEP (2) - on(up)(verify)
SECS PYRO ARM (2) - SAFE
If No Cold Soak,
H2O FLOW CONT AUTO - SEC
SEC RAD BYPASS
SEC COOL LOOP PUMP - AC1
SEC COOL LOOP EVAP - EVAP

SPS DEORBIT & ENTRY, pg E/2-1
SM RCS DEORBIT & ENTRY, pg E/3-1
SM/CM RCS DEORBIT & ENTRY (HYBRID), pg E/4-1

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

SECTION 2. SPS DEORBIT

P40 - SPS THRUSTING

RCS DAP
11102
01111

1 V37E 40E

F 50 18 REQUEST MNVR TO FDAI RPY ANGLES (.01°)
(AUTO) BMAG MODE (3) - RATE 2
SC CONT - CMC
CMC MODE - AUTO

FOR 3 AXIS MANEUVER:
V37E 00E V49E
LOAD 06 22 (180,180,0)
PRO
AT COMPLETION P40
PRO

2 06 18 AUTO MNVR TO FDAI RPY ANGLES (.01°)
SPS He tb(2) - bp
SPS He v1v(2) - AUTO

3 F 50 18 ATTITUDE TRIM ENABLE (.01°)
BMAG MODE (3) - RATE 2
ALIGN SC IN ROLL
PRO to 2 or continue
CHECK BORE SIGHT STAR (OPTICS & COAS)
CHECK PNL 8 (OPTICS OFF & STOW)
A/C ROLL (4) - OFF
Set ΔV ind (verify)
EMS FUNCT - ΔV
MAN ATT - RATE CMD
ATT DB - MIN
RATE - LOW
TRANS CONT PWR - ON
SCS TVC(2)-RATE CMD
ΔV CG-CSM
TVC GMBL DRIVE P&Y - AUTO
S-BD ANT - OMNI A

TIG - 12 ORDEAL 180, 180, 0
TIG - 8 HORIZ $0^{o} \pm 3^{o}$

Basic Date Feb. 1, 1969
Changed Feb.20, 1969

CSM 104

-07:00 MN BUS TIES (2) - ON (sequentially)
TVC SERVO PWR 1 - AC1/MNA
TVC SERVO PWR 2 - AC2/MNB
ROT CONTR PWR NORMAL 2 - AC
ROT CONT PWR DIR (2) - OFF
BMAG MODE - ATT 1/RATE 2
SC CONT - SCS
RHC #2 - unlocked
Primary TVC Check HORIZ CK
-05:00 GMBL MOT PITCH 1 - START - ON 12° MARK
GMBL MOT YAW 1 - START - ON +3°
Verify Trim Control & Set
Verify MTVC
SCS Only: SCS TVC (2) - AUTO
****
THC-CW
Verify no MTVC
Secondary TVC Check
GMBL MOT Pitch 2 - START - ON
GMBL MOT YAW 2 - START - ON
VERIFY MTVC
CONFIRM & SET GPI TRIM
SC CONT - CMC (SCS)
THC - NEUTRAL
Verify no MTVC
PRO
ROT CONT PWR NORMAL - 2 AC/DC
ROT CONT PWR DIRECT(2)-MNA/MNB
ENTR

4 F 50 25 R1 00204 ENABLE ENG. GIMBAL TEST
(REJECT) ENTR
(ACCEPT) PRO
If SCS - Null Error Needles
PROG ALM - TIG SLIPPED
*RSET *
*or V5N9E 01703 *
* KEY RLSE to 5 *

-02:00
5 06 40 TF GETI,VG,ΔVM (min-sec,.1fps,.1fps)
FDAI SCALE - 5/5

Basic Date Feb. 1, 1969
Changed Feb.12, 1969

LIMIT CYCLE - OFF
UPDATE DET
ΔV THRUST A - NORMAL:
THC - armed
RHC (2) - armed
CB SPS P2 & Y2 - open

00:35 DSKY clears
00:30
06 40 Ave g on UP TLM CMD - RESET, OFF
TAPE RCDR - RECORD/HBR/FWD
CHECK PIPA BIAS ≤2 FPS in 5 sec
EMS MODE-AUTO
PERFORM ULLAGE (if req)
(BACKUP) DIRECT ULLAGE pb
CONTROL ATT w/RHC
MONITOR ΔVM COUNTING UP

-00:05
6 F 99 40 ENG ON ENABLE
(AUTO) PRO (IGN WHEN TFI≥:00 sec)
(BYPASS) ENTR to 9

00:00
7 IF SCS, THRUST ON pb - push for ignition
IGN 06 40 TFC, ΔVG, ΔVM (min-sec,.1fps,.1fps)
*SPS THRUST FAIL: *
*F 97 40 TFC,VG,ΔVM *
*(RESTART) ENTR to 6 *
*(CONTINUE) PRO *
*Poss Prog ALARM *
*Key V05 N09E *
* 01407(VG increasing)*
*Select MTVC *
SPS THRUST lt - on
Monitor thrusting:
Pc=95-105 psia
SPS ENG INJ vlvs - OPEN
SPS He VLV tb(2) - gray
SPS FUEL & OXID PRESS-170-195 psia
TIG +3 ΔV THRUST B - Normal
ECO
8 F 16 40 TFC(STATIC),VG,ΔVM (min-sec,.1fps,.1fps)

Basic Date Changed — Feb. 1, 1969 Feb. 20, 1969

CSM 104

P40,61

ECO+1 sec — ΔV THRUST (2) - OFF
VERIFY ALL THRUST OFF CUES
FC 2 NMA&B - OFF (tb-bp)

ECO+10 sec
PRO

9 F 16 85 — VG XYZ (.1fps)
(A/C or B/D ROLL - ON) Vc _____
NULL OUT VG COMPONENTS VG x YZ _____
EMS MODE - STBY _____
GIVE GROUND RESIDUALS _____
RECORD ΔV COUNTER
PRO ΔT____ +tE _____

10 F 37 — 00E
V82E

11 F 16 44 — HA,HP,TFF (.1nm,.1nm,min-sec)
IF HP>49.4 NM R3=-59B59
PRO

P61 - MNVR TO CM/SM SEP ATT
Key V37E 61E
~~EMS FUNC - OFF~~
THC - locked
THC PWR - OFF
SC CONT - SCS
RATE - HIGH
Yaw right 45° (SEP ATT)
RATE - LOW
MAN ATT (3) - MIN IMP
RCS TRNFR - CM
Test Thrusters
RCS TRNFR-SM
MAN ATT (3) - RATE CMD
PRIM GLY TO RAD - pull to bypass
GLY RSVR IN vlv - OPEN
GLY RSVR BYPASS vlv - CLOSE
GLY RSVR OUT vlv - OPEN
02 PLSS vlv - PLSS
02 SM SUPPLY vlv - OFF
CAB PRESS REL vlv - (2)-BOOST/ENTRY
50 K If Unsuited

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

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

2 F 06 60 GMAX,VPRED,GAMMA EI (.01G,fps,.01°)
PRO

3 F 06 63 RTGO,VIO,TFE (.1nm,fps,min-sec)
RECORD & COMPARE WITH MSFN
PRO
CMC DISPLAYS P62 (or Key V37E 62E)
(no extended verbs in P62)

Basic Date Feb. 1, 1969
Changed Feb 20, 1969

4 F 50 25 R1 00041 (PERFORM SEP X-LIST)
VHF AM (2) - OFF
S BAND ANT - OMNI C
S-BD vol - increase
SM RCS PRIM & SEC PROP(4)-on(8 tb qray
SEC FUEL PRESS 4 -on (verify)
ABORT SYS PRPLNT - RCS CMD (verify)
FC PUMPS (3) - OFF
HI GAIN ANT PWR -OFF
Verify single suit compr oper
S-BD PWR AMP - LOW
CB ECS RAD CONT/HTR(2)-open
CB HTRS OVLD (2) - open
POT H2O HTR-OFF
CAB FANS (2)-OFF
GLY EVAP TEMP IN - MAN
CM RCS LOGIC -on(up)(verify)
SECS PYRO ARM(2)-on(up)
ATT DB-MAX
RATE-HIGH

CSM 104

5 TFF >9 min CM/SM SEP (2) -on(up)
MAN ATT (3) - MIN IMP
BMAG MODE (3) - RATE 2
C/W MODE -CM
RCS TRNFR - CM
CM RCS LOGIC-OFF

P61,63,64

Monitor Vm A/B
If <25 vdc go to EMERG
POWERDOWN pg
AUTO RCS SEL CM 1(6)-MNB
AUTO RCS SEL CM 2(6)-OFF
AUTO RCS SEL A/C ROLL (4) - OFF
PRO

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

7 F 06 22 FLY TO GMBL ANGS AT EI RPY (.01°)
MNVR TO ENTY ATT (0,37,0)
EMS MODE - STBY
EMS FCN - CW TO RNG SET
SET RANGE
EMS FCN-Vo SET
ALIGN SCROLL Vo to display index
EMS FCN - ENTRY
FDAI SCALE - as desired

8 P63 AUTO

9 06 64 G,VI,RTGO (+ overshoot)
V82 to monitor TFF, then N64 for g
Start EMS manually at RET .05g

10 .05g P64 (AUTO)
06 68 BETA,VI,HDOT (monitor)
SC CONT - CMC
.05 g lt - on
MAN ATT (3)-RATE CMD
.05 g sw - on (up)
EMS ROLL - on (up)

Basic Date Feb. 1, 1969
Changed Feb.20, 1969

CSM 104

11 P67 (AUTO AT .2G)

06 66 BETA, CRS ERR, DWN ERR (monitor)
Key VERB
Compare chart DRE with R3 for G&N acceptance
DRE +100,MAN ATT ROLL-ACCL CMD
BETA When DRE -6 To 0
Fly BBA & EMS
CM RCS: Change Rings At He TK
Press - 1150

12 V82E

F 16 44 HA, HP, TFF
N 64 E G, VI, RTGO
N 68 E BETA, VI, HDOT

13 F 16 67 MON RTGO, PRES LAT, LONG (.1nm,.01° .01°)
At VI = 5000, Check STM PRESS
(AT VI = 2300 fps, 65K)
IF RTGO=-,LIFT UP
=+,LIFT DOWN
EMS RTGO [ ]
EMS MODE - STBY
EMS FCN - OFF
MONITOR ALTIMETER

16 67 [ ]

EARTH LANDING, pg E/5-1

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

SECTION 3. SM RCS DEORBIT

Obtain new maneuver & entry update from MFSN

P30 EXTERNAL ΔV

1		V37E30E	NOTE: COMPUTE TIG	
	F 06 33	GETI	TFP _____	(N32)
		PRO	+ 43+00	
			GIVES TIG _____	
2	F 06 81	ΔVXYZ(LV)		
		PRO		
3	F 06 42	HA,HP,ΔV(Req)		
		SET ΔV ind		
		PRO		
4	F 16 45	M,TFI,MGA		
		SET DET		
		PRO		
5	F 37	00E		
		SEC FUEL PRESS (4) - ON(Up)		

P41 - RCS THRUST

1		V37E 41E	
	F 50 18	REQUEST MNVR TO FDAI RPY ANGLES	(.01°)
	(AUTO)	BMAG MODE (3) - RATE 2	
		PRO	
	(MAN)	ENTR to 3	
2	06 18	AUTO MNVR TO FDAI RPY ANGLES	(.01°)
3	F 50 18	ATT TRIM ENABLE RPY	(.01°)
		ALIGN SC in ROLL	
		ENTR to 4	
		PRO (TRIM to 2)	
4	06 85	VGX,VGY,VGZ	(.1fps)
		CHECK BORESIGHT STAR (COAS & OPTICS)	
		MAN ATT (3) - RATE CMD	

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

CSM 104

ATT DB - MIN
RATE - LOW

-00:35 DSKY clears

-00:30 THC PWR - ON
BMAG MODE (3) - ATT1/RATE 2

5 16 85 VGXYZ (Ave g on) (.1fps)
HAND CONTROLLERS - armed
LIMIT CYCLE - OFF
UP TLM CMD - RSET, NORMAL
TAPE RCDR motion - STOP (center)
00:00 EMS MODE - AUTO

6 F 16 85 VGXYZ (.1fps)
NULL OUT COMPONENTS
BURN COMPLETE
PRO
~~EMS FUNC - OFF~~
EMS MODE - STBY
RECORD ΔV COUNTER/COMPONENTS
TAPE RCDR motion - STOP (center)
TRANS CONTR PWR - OFF
THC - neutral, locked

7 F 37 Key 00E
V82E

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

EI-27:00 MN BUS TIES (2) - on (up)

EI-25:00 TVC SERVO PWR 1 - AC1/MNA
TVC SERVO PWR 2 - AC2/MNB
GMBL MTRS (4) - START
PRIM GLY TO RAD - pull to bypass
GLY RSVR IN vlv - OPEN
GLY RSVR BYPASS vlv - CLOSE
GLY RSVR OUT vlv - OPEN
O2 PLSS vlv - ON
O2 SM SUPPLY vlv - OFF
CAB PRESS REL vlv - (2)-BOOST/ENTRY
50K IF Unsuited

Basic Date Feb. 1, 1969
Changed Feb.20, 1969

CSM 104

EI-23:00 FC 2 MNA&B - OFF (tb-bp)

EI - 15:00 P61 - MNVR TO CM/SM SEP ATT
Key V37E 61E
~~EMS FUNC - OFF~~
THC - locked
THC PWR - OFF
SC CONT - SCS
RATE - HIGH
Yaw left 45° ROLL 180 To L DWN
RATE - LOW (SEP ATT)
MAN ATT (3) - MIN IMP
RCS TRANS - CM
Test Thrusters
RCS TRANS - SM
MAN ATT (3) - RATE CMD

1 F 06 61 IMPACT LAT,LONG,HDS UP
(.01°,.01°,+ 00001)
PRO

2 F 06 60 GMAX,VPRED,GAMMA EI (.01G,fps,.01°)
PRO

3 F 06 63 RTGO,VIO,TFE (.1nm,fps,min-sec)
RECORD & COMPARE WITH MSFN
PRO
CMC DISPLAYS P62 (or Key V37E 62E)
(no extended verbs in P 62)

4 F 50 25 R1 00041 (PERFORM SEP X-LIST)
VHF AM (2) - OFF
S BAND ANT - OMNI C , Volume Up
SM RCS PRIM & SEC PROP(4)-on (8 tb gray)
(verify)
SEC FUEL PRESS (4) - on
ABORT SYS PRPLNT - RCS CMD (verify)
FC PUMPS (3) - OFF
HI GAIN ANT PWR - OFF
Verify single suit compr oper
S-BD PWR AMP - LOW
CB ECS RAD CONT/HTR (2)-open

Basic Date Feb. 1, 1969
Changed Feb.20, 1969

CSM 104

P61,63

CAB FANS (2) - OFF
GLY EVAP TEMP IN - MAN
CM RCS LOGIC - on (up)(verify)
SECS LOGIC (2)-on(up)(verify)
SECS PYRO ARM (2) - on (up)
ATT DB - MAX
RATE - HIGH
TAPE RCDR - FWD

5 CM/SM SEP (2) - on (up)
MAN ATT (3) - MIN IMP
BMAG MODE (3) - RATE 2
C/W MODE - CM
RCS TRANS - CM
CM RCS LOGIC - OFF
Monitor VmA/C
If < 25 vdc go to EMERG POWERDOWN, pg ____
AUTO RCS SEL CM 1 (6) - MNB
AUTO RCS SEL CM 2 (6) - OFF
AUTO RCS SEL A/C ROLL (4) - OFF
PRO

6 F 06 61 IMPACT LAT, LONG, HDS UP (.01°,.01°,+00001)
PRO

7 F 06 22 FLY TO GMBL ANGS AT EI RPY (.01°)
MNVR TO ENTRY ATT (180,52,0)
EMS MODE - STBY
EMS FCN - CW TO RNG SET
SET RNG COUNTER FOR RTGO
EMS FCN - Vo SET
ALIGN SCROLL Vo to display index
EMS FCN - ENTRY
ATT DEADBAND - MAX
RATE - HIGH
FDAI SCALE - as desired

8 P63 AUTO

Basic Date Feb. 1, 1969
Changed Feb.20, 1969

P63,64,67

9 06 64 G,VI,RTGO (+ overshoot)
V82 to monitor TFF, then N64 for g
Start EMS manually at RET .05g

10 .05g P64 AUTO
06 68 BETA, VI HDOT (monitor)
.05g lt - on
.05g sw - on (Up)
EMS ROLL - on (up)

11 P67 AUTO AT .2G
06 68 BETA, CRS ERR, DWN, ERR (monitor)
Key VERB
Compare chart DRE with R3 for G&N acceptance
DRE > + 100, MAN ATT ROLL-ACCL CMD
BETA When DRE -6 To 0
FLy BBA & EMS
CM RCS: Change Rings When He TK Press -1150
1 g SC CONT -CMC
MAN ATT (3) - RATE CMD

12 V82E
F 16 44 HA,HP,TFF
N 64 E G, VI, RTGO
N 68 E BETA, VI, HDOT

13 F 16 67 MON RTGO,PRES LAT,LONG(.1nm,.01°, .01°)
At VI = 5000, Check STM PRESS
(AT VI = 2300 fps, 65K)
IF RTGO =-,LIFT UP
=+,LIFT DOWN
EMS RTGO [redacted]
EMS MODE - STBY
EMS FCN - OFF
MONITOR ALTIMETER
16 67 [redacted]
EARTH LANDING,
pg E/5-1

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

P30,41

SECTION 4 - SM/CM RCS DEORBIT (HYBRID)

Obtain new maneuver and entry update from MFSN

P30 EXTERNAL ΔV

1		V37E 30E
	F 06 33	TIG
		PRO
2	F 06 81	ΔV XYZ(LV)
		PRO
3	F 06 42	HA,HP,ΔV
		EMS ΔV to DESIRED ΔV
		PRO
4	F 16 45	N,TFI,MGA
		Set Det
		RSI to Lift Down
		PRO
5	F 37	
		41 E (RCS Thrusting)
6	F 50 18	Request man.
		BMAG MODE (3) - RATE 2
		PRO
7	06 18	AUTO MANEUVER
8	F 50 18	ATT TRIM ENABLE
		ALIGN SC IN ROLL 0°
		PRO (TRIM to 7)
		ENTR to 9
9	06 85	VGX,VGY,VGZ
		CHECK BORESIGHT STAR (COAS & OPTICS)
		VERIFY THRUSTING ATT & HOLD
		V25 N17E
		LOAD FDAI R,P,Y FOR CM RCS
		ADD 110° TO SM RCS PITCH ATT.
		KEY V23, N40E, + 00000E

NOTE: COMPUTE TIG
TFP _____ (N32)
\+ 43+00
GIVES TIG _____

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

CSM 104

P41

10 TIG-10:00	CM/SM PRE-SEPARATION
	CB RCS LOGIC-closed(verify)
	MN BUS TIE(2)-on (up)
	PRIM GLY TO RAD - pull to bypass
	GLY RSVR IN vlv - OPEN
	GLY RSVR BYPASS vlv - CLOSE
	GLY RSVR OUT vlv - OPEN
	O2 PLSS vlv - PLSS
	O2 SM SUPPLY vlv - OFF
	CAB PRESS REL vlv (2) - BOOST/FNTRY
	50 K If Unsuited
	VHF AM (2) - OFF
	S-BAND ANT - C
	Increase SBD vol
	SM RCS PRIM & SEC PROP (4) - OPEN
	ABORT SYS PRPLNT - RCS CMD (verify)
	TVC SERVO PWR 1 - AC1/MNA
	TVC SERVO PWR 2 - AC2/MNB
TIG - 5 min	SPS GIMB MOT (4) - START/ON
	FC 2 MN BUS A&B (2) - OFF (tb-bp)
	FC PUMPS (3) - OFF
	HI GAIN ANT PWR - OFF
	Verify single suit compr oper
	S-BD PWR AMP - LOW
	CB ECS RAD CONT/HTR (2) - open
	CB HTRS OVLD (2) - open
	POT H2O HTR - OFF
	CAB FANS (2) - OFF
	GLY EVAP TEMP IN - MAN
	CM RCS LOGIC - on(up)(verify)
	SECS LOGIC (2) - on (up)(verify)
	AUTO RCS SELECT (16) - MNB
	ROT CONTR PWR NORMAL (2) - AC/DC
	ROT CONT PWR DIRECT (2) MNA/MNB
	MAN ATT (3) - RATE CMD
	LIMIT CYCLE - OFF
	ATT DBD - MIN
	RATE - LOW
-00:35	TRANS CONTR PWR - ON
	DSKY clears

Basic Date Feb. 1, 1969
Changed Feb.20, 1969

CSM 10

-00:30
11 16 85 VG XYZ (AVE g ON)
HAND CONTROLLERS - armed
UP TLM CMD - RSET, NORMAL
TAPE RCDR - RCD/HBR/FWD
EMS MODE - AUTO
BMAG MODE (3) - ATT1/RATE 2

12 00:00
F 16 85 BURN EMS ΔV CNTR TO ZERO
SECS PYRO ARM (2)-on (up)
CM/SM SEP (2) - on (up)
C/W MODE - CM
RCS TRNFR - CM
CM RCS LOGIC - OFF

13 SC CONT - SCS
MAN ATT PITCH - ACCEL CMD
KEY V63E
PITCH-UP TO CM RCS DE-ORBIT ATT

V16 N40E

14 SM RCS CUT-OFF +1:00
RHC #1 PITCH DOWN
RHC #2 MODULATE PITCH TO NULL ERROR NEEDLES

15 N40(R3) to MONITOR ΔVM
V82E to MONITOR HP
RECORD HP
Vc = _____ for CO

16 BURN COMPLETION
PRO (to terminate V82)
PRO

17 F 37 Key 00E
TAPE RCDR - OFF

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

P41,61,63

18 Monitor Vm A/B
If 25 vdc go to EMERG
POWERDOWN, pg
AUTO RCS SELECT CM 2 (6) - OFF
AUTO RCS SELECT A/C ROLL(4)-OFF
MAN ATT (3) - MIN IMP
BMAG MODE (3)-RATE 2 F
TAPE RCDR-FWD

EI-15:00 Key 37E 61E

19 F 06 61 Load LAT,LONG,HDS UP (.01°,.01°,+00001)
PRO

20 F 06 60 GMAX,VPRED,GAMMA EI (.01G,fps,.01°)
PRO

21 F 06 63 RTGO,VIO,TFE (.1nm,fps,min-sec)
RECORD & COMPARE WITH MSFN
PRO
CMC DISPLAYS P62 (or Key V37E 62E)
(No extended verbs in P62)

22 F 50 25 R1 00041 (SEP)
PRO

23 F 06 61 IMPACT LAT,LONG,HDS UP
(.01°,.01°,+00001)
PRO

24 F 06 22 FLY TO GMBL ANGS AT EI RPY (.01°)
MNVR TO ENTRY ATT (180,52,0)
EMS MODE - STBY
EMS FCN - CW TO RNG SET
SET RNG COUNTER FOR RTGO
EMS FCN - Vo SET
ALIGN SCROLL Vo to display index
EMS FCN - ENTRY
ATT DEADBAND - MAX
RATE - HIGH
FDAI SCALE - as desired

25 P63 AUTO

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

26 06 64 G,VI,RTGO (+ overshoot)
V82 to monitor TFF, then N64 for g
Start EMS manually at RET .05g

27 .05g P64 AUTO
06 68 BETA, VI HDOT (monitor)
.05g lt - on
.05g sw - on (Up)
EMS ROLL - on (up)

28 P67 AUTO AT .2G
06 68 BETA, CRS ERR, DWN, ERR (monitor)
Key VERB
Compare chart DRE with R3 for G&N acceptance
DRE > + 100, MAN ATT ROLL-ACCL CMD
BETA When DRE -6 To 0
FLy BBA & EMS
CM RCS: Change Rings When He TK Press -1150
1 g SC CONT -CMC
MAN ATT (3) - RATE CMD

29 V82E
F 16 44 HA,HP,TFF
N 64 E G, VI, RTGO
N 68 E BETA, VI, HDOT

30 F 16 67 MON RTGO,PRES LAT,LONG(.1nm,.01°,.01°)
At VI = 5000, Check STM PRESS
(AT VI = 2300 fps, 65K)
IF RTGO =-,LIFT UP
=+,LIFT DOWN
EMS RTGO [redacted]
EMS MODE - STBY
EMS FCN - OFF
MONITOR ALTIMETER
16 67 [redacted]
EARTH LANDING,
pg E/5-1

Basic Date Feb. 1, 1969
Changed Feb 20, 1969

SECTION 5. EARTH LANDING

50K' CAB PRESS REL vlv(2) - BOOST/ENTRY

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
x CM UNSTABLE x
RCS CMD - OFF
<40K' APEX COVER JETT pb - push
DROGUE DEPLOY pb - push
x (2 sec after apex cover jett) x
xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

40K' SECS LOGIC (2) - on(up) (verify)
SECS PYRO ARM (2) - on(up) (verify)
ELS LOGIC - on
ELS - AUTO

24K' SCS RCS disable . . . . . (RCS CMD - OFF)
Apex cover jett . . . . . (APEX COVER pb)
(WAIT 2 SECS)
Drogues deployed . . . . . (DROGUE pb)

23.5K' CAB PRESS increasing (IF NO INCR BY 17K,
CAB PRESS REL vlvs (2) - DUMP)

10K' Mains deployed . . . . . (MAIN DEPLOY pb)
VHF ANT - RECY
VHF AM - SIMPLEX A, BCN - ON
VOICE REPORT
CAB PRESS REL vlv (2) - close
DIRECT O2 - OPEN (CCW)
CM RCS LOGIC - on (up)
CM PRPLNT DUMP - on (burn audible)
No burn, use both RHC's
(DO NOT FIRE PITCH JETS)
CM PRPLNT PURGE - PURGE (to Zero He press)
CM RCS He DUMP pb-push
No decrease, use both RHC's
(DO NOT FIRE PITCH JETS)
CAB PRESS REL vlv (2) - BOOST/ENTRY
Strut lock - unlock
CB FLT & PL BAT BUS A,B,&BAT C (3) - close
CB FLT & PL MNA & B (2) - open
FLOOD POST LDG
CB SPS GIMB MOT (4)-open
CM RCS PRPLNT (2) - OFF

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

CSM 104

3K'

≤1000

CAB PRESS REL vlv - DUMP
ROT CONT PWR DIRECT (2) - OFF
CAB PRESS REL vlv (2) - CLOSE
MN BUS TIES (2) - OFF
Postlanding check ng E/6-1

DIRECT O2 - OPEN (CCW)

Basic Date Feb. 1, 1969
Changed Feb. 5, 1969

SECTION 6. POST LANDING

1. TOUCHDOWN AND STABILIZATION
ELS AUTO - AUTO (verify)
CB MAIN RELEASE PYRO (2) - closed
DIRECT O2 - closed (CW)
ELS LOGIC - ON (verify)
MAIN RELEASE - on (up)
SECS PYRO ARM (2) - SAFE
SECS LOGIC (2) - OFF
CB BAT RELAY BUS (2) OPEN
VHF AM B - OFF (center)
CB UPRT COMPR (2)-close
CB FLT/PL VENT - close
CB FLOAT BAG (3) - close
If Stable II
FLOAT BAG (3) - FILL till 2 min after upright, then OFF
VHF AM A & BCN - OFF while inverted

If STABLE I
After 10 min Cooling Period,
FLOAT BAG (3) - FILL 7 min
FLOAT BAG (3) - OFF

2. POST STABILIZATION AND VENTILATION
CB MNA BAT BUS A AND BAT C (2) - open
CB MNB BAT BUS B AND BAT C (2) - open
CB FLT/PL BAT C - open
CB PYRO A SEQ A - open
CB PYRO B SEQ B - open
PL DUCT COVER - remove
PL VENT VLV handle - pull
PL VENT - HIGH or LOW
PL BCN LT & DYE MARKER - ON (swimmer COMM)
INTERCOM (3) - ~~REC~~ T/R
DEPLOY GRAPPLING HOOK if required
Install directional air flow ducts
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
EACH HR - CHECK DC VOLTS > 27.5 V
If Not:
CB FLT & PL BAT BUS A&B (2) - open
CB FLT & PL BAT C - close
GO TO LOW POWER CHECKLIST
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

3. POSTLANDING COMMUNICATIONS
VHF ANT-RECY (verify)
VHF BCN - ON (verify)
If no contact with recovery forces
MONITOR VHF BEACON Transmission with survival radi
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
X VHF Beacon not operating: X
Connect survival transceiver to ant
cable and place radio in BCN mode
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

4 LOW POWER CHECKLIST
VHF BCN - OFF
VHF (3) - RCV
FLOOD FIXED - OFF
VHF AM 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

5. STABLE I EGRESS
CB BAT A, B, C PWR ENT/PL (3) - open
CONNECT SURVIVAL RUCKSACKS TOGETHER
CONNECT RAFT WHITE LANYARDS TO SUITS
CONNECT RAFT GREEN LANYARD TO CM
OPEN HATCH - INFLATE RAFT
INFLATE WATER WINGS AND EGRESS

6. STABLE II EGRESS
RECONFIGURE COUCH
CONNECT RAFT TO CM WITH GREEN LANYARD
CONNECT RAFT WHITE LANYARDS TO "H2O" WINGS
VERIFY CABIN PRESSURE RELIEF VALVES (2) - closed
PRESSURE EQUILIZATION VALVE - open
REMOVE AND STOW FWD PRESSURE HATCH
WHEN TUNNEL HAS FLOODED
CB BAT A, B, C PWR ENT/PL (3) - open
REMOVE & STOW ABLATIVE HATCH
DROP HARDWARE RUCKSACK DOWN TUNNEL, EXIT FEET
FIRST WITH RAFT: WHEN CLEAR OF CM INFLATE
WATER WINGS AND RAFT

Basic Date . 1, 1969
Changed

CSM 1

SECTION 7. ENTRY EMERGENCY PROCEDURES

FIRE/SMOKE IN CM DURING ENTRY

1 CABIN FANS (2) - OFF

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
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 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 procedures using TBD deviations for an oxidizer rich dump.

5 CAB PRESS RELF vlv (RH) - DUMP

6 Continue ENTRY

Contamination in CM

1 Don O2 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 O2 masks or remain in suit and accept contamination level in cabin.

Basic Date Feb. 1, 1969
Changed
CSM 104

CAUTION
If in PGA's, adjust DIRECT O2 to maintain suit to cabin ΔP > .38 psi.

b. Retain O2 masks and scrub cabin atmosphere through suit loop. If initially suited, establish partially suited or shirtsleeve configuration and don O2 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 - ACl

2 SUIT COMPR 1 - OFF

3 DIRECT O2 vlv - OPEN (CCW) for 1 minute then close (cw)

If condition persists:

4 SUIT COMPR 2 - OFF

5 DIRECT O2 vlv - OFF

6 Doff helmet

7 Don emergency O2 masks

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

CM RCS FAILS TO PRESSURIZE OR FEED PRPLNT

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

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

BUS LOST RECONFIGURATION

A. Loss of Main Bus A
   1. Pre CM/SM Sep
      a. FC 2 - Main B only
      b. FC 1 - Off (Main A&B) (On line for de-orbit burn)
      c. Inverter 3 - Main B,AC 1
      d. CB Main A Bat Bus A - Open
      e. CB Main A Bat C - Open
      f. CB Main B Bat C - Closed
      g. CB Bat C Bat Bus A - Closed
      h. Auto RCS Select (16) - MNB
      i. FDAI Select -2
      j. ROT Control PWR Direct 2 - Main B
      k. BMAG Mode (3) - Rate 2

Prior to CM/SM Sep

1. Auto RCS Select SW - Ring 2 - MNB; all others - Off

2. Post CM/SM Sep
   a. CB Main A Bat C - Open
   b. CM Main A Bat Bus A - Open
   c. Inverter 3-Main B, AC 1
   d. FDAI Select - 2
   e. Auto RCS Pitch, Yaw & B/D Roll (12) - Main B (as required)
   f. ROT Control Pwr Direct 2 - MNB

NOTE

If necessary to tie Bat A & C to Main B, perform the following:

(a) CB Bat A Pwr Entry/Post Landing CLOSED (Verify)
(b) CB Bat C Pwr Entry/Post Landing CLOSED (Verify)
(c) CB Bat C to Bat Bus A - CLOSED

B. Loss of Main Bus B

1. Pre CM/SM Sep
   a. FC 2 - Main A only
   b. FC 3 - Off (Main A&B) (On line for de-orbit burn)
   c. Inverter 3 - MNA, AC 2
   d. CB Main B Bat C - Open
   e. CB Main B Bat Bus B - Open
   f. CB Bat C Bat Bus B - C osed
   g. CB Main A Bat C - Closed
   h. Auto RCS Select (16) - MNA
   i. ROT Control Pwr Direct 1 - MNA
   j. SCS Electronics Pwr SW - ECA
   k. BMAG Mode (3) - Rate 1

Basic Date Dec. 1, 1969
Changed Feb. 20, 1969

Prior to CM/SM Sep

1. Auto RCS Select SW - Ring 1 - MNA;
   all others - Off

2. Post CM/SM Sep

   a. CB Main B Bat C - Open
   b. CB Main B Bat Bus B - Open
   c. Inverter 3 - MNA, AC 2
   d. Auto RCS Pitch, Yaw and B/D Roll (12)-MNA
   e. ROT Control Pwr Direct 1 - MNA

NOTE

If necessary to tie Bat B & C to Main A, perform the following:

(1) CB Bat B Pwr Entry/Post Landing-CLOSED (Verify)
(2) CB Bat C Pwr Entry/Post Landing-CLOSED (Verify)
(3) CB Bat C to Bat Bus B - CLOSED

   f. BMAG MODE(3)-RATE 1

C. Loss of Bat Bus A

1. Pre CM/SM Sep

   a. Prepare for two battery entry
   b. Auto RCS Select SW - Ring 2 - MNB;
      all others - Off
   c. After CM/SM Sep
      (1) RCS Trnfr - CM - Center
   d. At Apex Jett
      (1) SCS Contr/Auto MNA & B - Open

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

2. Post CM/SM Sep

   a. Perform two battery entry power down
   b. At Apex Jett
      (1) SCS Contr/Auto MNA & B - Open

D. Loss of Bat Bus B

1. Pre CM/SM Sep (Entry)
   a. Prepare for two battery entry
   b. Auto RCS Select SW - Ring 1 - MNA; all others - Off
   c. After CM/SM Sep
      (1) RCS Trnfr - CM - Center
   d. At Apex Jett
      (1) SCS Contr/Auto MNA & B - Open

2. Post CM/SM Sep
   a. Perform two battery entry power down
   b. At Apex Jett
      (1) SCS Contr/Auto A & B - Open

E. Loss Of AC Bus 1

1. Pre CM/SM Sep
   a. AC Inverter 1 MNA - Off
   b. BMAG Mode (3) - Rate 2
   c. FDAI Select - 2
   d. Suit Compressor 2 - AC 2
   e. S-Band Normal Xponder - SEC
   f. S-Band Normal Pwr Amp - SEC
   g. ECS Glycol Pump 2 - AC 2

2. Post CM/SM Sep
   a. AC Inverter 1 MNA - Off
   b. BMAG Mode (3) - Rate 2
   c. FDAI Select - 2
   d. S-Band Normal Xponder - SEC
   e. S-Band Normal Pwr Amp - SEC
   f. Suit Compressor 2 - AC 2

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

F. Loss of AC Bus 2

1. Pre CM/SM Sep
   a. AC Inverter 2 Main B - Off
   b. Fuel Cell Pump 2,3 - AC 1
   c. FDAI Select - 1
   d. BMAG Mode (3) - Rate 1
   e. G&N Power - AC 1
   f. S-Band Normal Pwr Amp - PRI
   g. S-Band Normal Xponder - PRI

2. Post CM/SM Sep
   a. If Bus not previously lost, perform:
      (1) AC Inverter 2 Main B - Off
      (2) FDAI Select - 1
      (3) BMAG Mode (3) - Rate 1
      (4) S-Band Normal Pwr Amp - PRI
      (5) S-Band Normal Xponder - PRI

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

MN BUS VOLTAGE < 26.0, NO SHORT PWR DOWN

	CURRENT- AMPS
1. Power Amp - Off	3.53
2. Cabin Fans (both) - Off	1.94
3. Sec Coolant Loop - Reset For 58 SEC. Then Off Sec. Glycol Pump (both) - Off	4.26
4. If Unsuited Suit Compressor both - Off	8.4 (og')
5. Tape Recorder Fwd/Rwd - Off	1.82
6. Potable H2O Heater - Off	1.6
7. Lights (as required)	
8. Optics Power (Pnl 5 optics MN A & B CB) - Open	6.5
9. Pri Glycol Pump (both) - Off	2.77 Per Pump
10. Power SCE - Off	0.65
11. Telecom Group 1 & 2 - Off	2.2
12. Instrumentation ESS Main A/B CB - Open	4.7

Note: After 0.05g, Guidance and Navigation CB (8) Open

CONTINGENCY POWER-ENTRY CONFIGURATION

The following studies indicate the equipment which must be powered down for an entry, where either one or two entry batteries have been lost;

A. Two Battery Entry Configuration

B. One Battery Entry Configuration with Comm. and W/O G&N

C. One Battery Entry Configuration with SCS and G&N Powered and no Comm.

A. Two Battery Entry Configuration

1. Tie one battery to each Main Bus/Battery Bus.
2. Perform a G&N Burn with 3 FC and 2 batteries.
3. Prior to CM/SM SEP power down the following equipment:

Equipment	Watts DC
Tape Recorder Fwd/Rewind-OFF	48.3
ECS Glycol Pumps - OFF	77.2
Glycol Evap H_2O Flow - OFF	4.1
Glycol Evap Steam Press - MAN	49.2
Glycol Evap Steam Press INCR/DECR-INCR (For 58 sec.	
Sec Coolant Loop - Reset (For 58 sec then Off)	44.9
Sec Coolant Pump - Off	74.3
	298.0 WDC

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

This will reduce the entry loads to approximately 42.6 amps; post sep Main Bus Voltages (S/C 103 data) should be approximately 27.2 VDC.

B. One Battery Entry Configuration with Communications (TLM/Voice/Ranging) and without G&N.

1. Tie remaining battery to both Battery/ Main Buses.
2. Perform G&N burn with 3 FC and 1 battery.
3. Prior to CM/SM SEP power down the following equipment:

Equipment	Watts DC
G&N CB's (10) MDC-5-Open	295.6 (CMC, IMU, & Misc. Lights)
Tape Recorder Fwd/Rewind-OFF	48.3
ECS Glycol Pumps - OFF	77.2
Glycol Evap H_2O	4.1
Glycol Evap Steam Press - MAN	49.2
Sec Coolant Loop - Reset(for 58 sec then OFF)	44.9
Sec Coolant Pump - OFF	74.3
Glycol Evap Temp In - MAN	11.6
Glycol Evap Steam Press INCR/DECR-INCR (For 58 Sec. if time allows)	
	605.2

This should reduce the entry load to approximately 31.6amps with a main bus voltage of 26.4 VDC.

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

If the main bus voltage is < 25.5 VDC at sep, power down the following additional equipment:

Power SCE - OFF	18.2 WDC
Telecom PCM TLM CB (2)-OPEN	27.7 WDC
Instrumentation ESS Main A/B CB (2) - OPEN	30.8 WDC
	76.7 WDC

This will decrease the total spacecraft load to approximately 28.9 amps with a resulting gain of 0.3 volts to the main buses.

C. One Battery Entry Configuration with SCS and G&N Powered and no Communications (No TLM/Voice/Ranging).

1. Tie remaining battery to both Battery/ Main Buses

2. Perform G&N burn with 3 FC and 1 battery

3. Prior to CM/SM sep power down the following equipment:

Equipment	Watts DC
ECS Glycol Pumps - OFF	77.2
Glycol Evap H2O Flow - OFF	4.1
Glycol Evap Steam Press - MAN	49.2
Sec Coolant Loop - Reset (for 58 sec then OFF)	44.9
Sec Coolant Pump - OFF	74.3
Glycol Evap Temp In - MAN	11.6
Glycol Evap Steam Press INCR/DECR-INCR(For 58 sec. if time allows)	

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969

Equipment	Watts DC
Instrumentation ESS Main A/B- OFF	30.8
BMAG 2 - OFF	72.8
EMS - OFF	54.6
Select One Inverter Operation	112.0
FLT Bus Mn A/B - OPEN	
PMP	8.7
Xponder	1.1
SCE	18.2
DSE (DC)	2.8
Telecomm Group 1 & 2 - OFF	
Pwr Ampl	98.6
Xponder	23.8
PCM TLM	27.8
DSE (AC)	48.3
	777.4

This should reduce the entry loads to approximately 26.5 amps with the main bus voltage 26.8 VDC (S/C 103 data).

MN BUS VOLTAGE 26.0, NO SHORT PWR DOWN

	CURRENT - AMPS
1. Power Amp - Off	3.53
2. Cabin Fans (both)-Off	1.94
3. Sec Coolant Loop - Reset For 58 sec. Then Off	4.26
4. If Unsuited Suit Compressor both - Off	8.4(og')
5. Tape Recorder Fwd/Rwd-Off	1.82
6. Potable H2O Heater - Off	1.6
7. Lights (as required)	
8. Optics Power (Pnl 5 optics Mn A & B CB)-Open	6.5
9. Pri Glycol Pump (both)-Off	2.77Per Pump
10. Power SCE - Off	0.65
11. Telecom Group 1 & 2-Off	2.2
12. Instrumentation ESS Main A/B CB -Open	4.7

NOTE: After 0.5g,Guidance and Navigation CB(8) Open

Basic Date Feb. 1, 1969
Changed Feb. 20, 1969