



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

APOLLO 17
ALL LAUNCH DATES
BASIC
CSM
CONTINGENCY
CHECKLIST

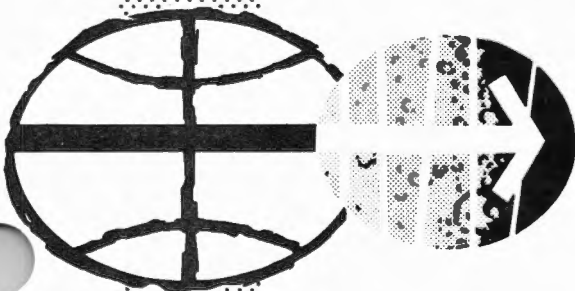
PREPARED BY

FLIGHT PROCEDURES BRANCH

CREW PROCEDURES DIVISION

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

AUGUST 29, 1972



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CSM CONTINGENCY CHECKLIST

August 29, 1972

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CSM CONTINGENCY CHECKLIST

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CSM POWER CRITICAL LUNAR ORBIT

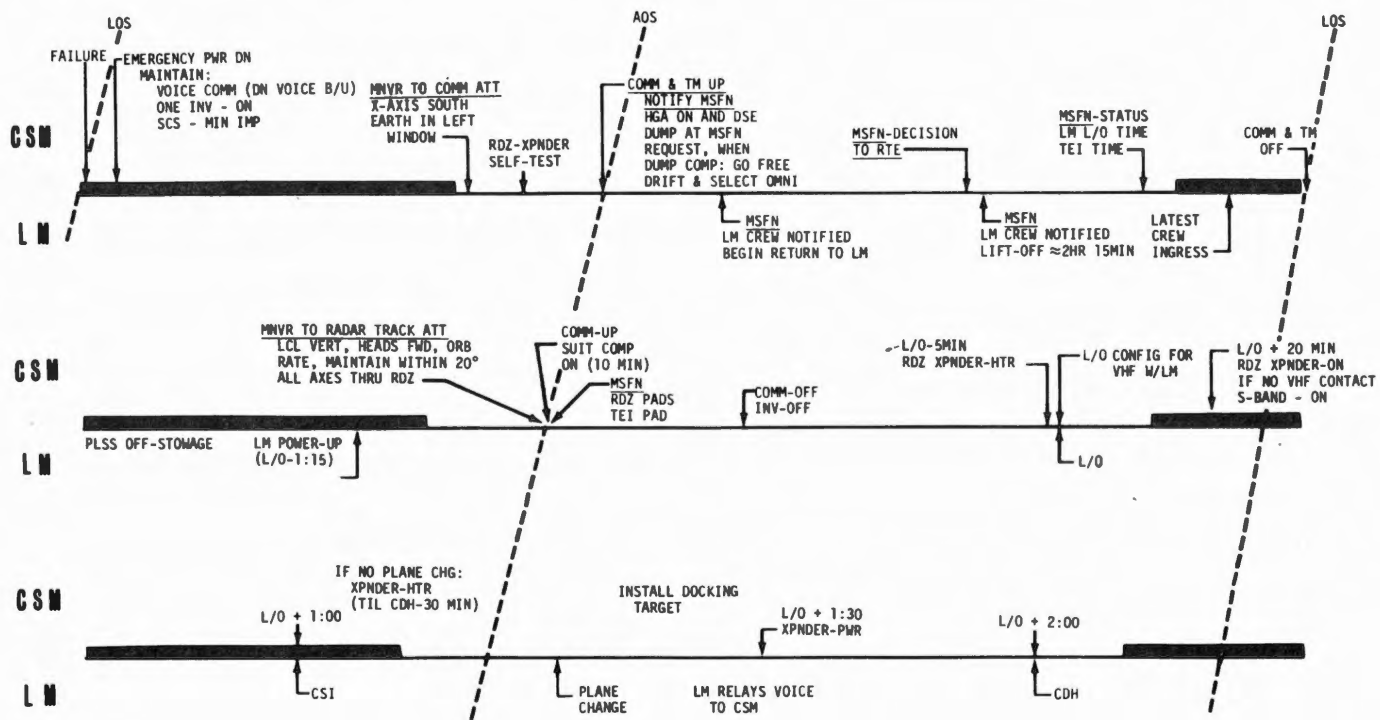
CSM POWER CRITICAL LUNAR ORBIT

BACK

COLOR

DATE 8/29/72

DATE 8/29/72



110

CSM POWER CRITICAL (LM ON SURFACE)

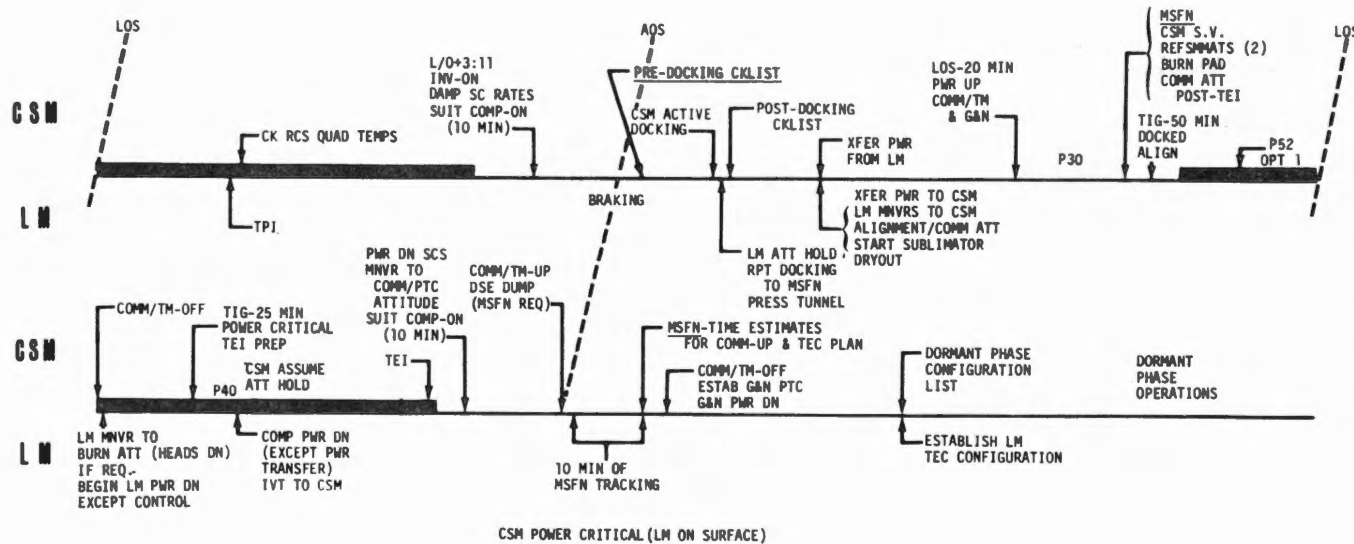
LM ON SURFACE

LM ON SURFACE

BACK

COLOR

1-2
C



DATE 8/29/72



C
1-3

CSM POWER CRITICAL LUNAR ORBIT
LM on Surface Rndz & TEI Prep

FAILURE Perform EMERG PWR DOWN, pg EMER/1-6

Verify power on MNB

AC BUS PWR UP

INV 2 - MNB

INV 2 AC1 & AC2 - on (up)

AC1 & AC2 RSET - RSET, on

Verify AC volts > 110 vac

ENABLE MIN IMPULSE (CMC or SCS)

If AC Inverter on for COMM,

* use SCS min impulse *

CMC MIN IMPULSE (~ 3 amp)

PRO, push (~ 5 sec)

F37 00E

SC CONT - CMC/FREE

ROT CONTR PWR NORMAL 2 - AC/DC

AUTO RCS SELECT - single jet (MNB)

When min impulse not req'd:

AUTO RCS SELECT (a11) - OFF

ROT CONTR PWR NORMAL 2 - OFF

V37E 06E

PRO, push (~ 5 sec) until DSKY blanks

or SCS MIN IMPULSE (~ 1 amp)

INV 2 - MNB (~ 5 amp)

cb SCS LOGIC BUS (4) - close

SCS ELEC PWR - ECA

ROT CONTR PWR NORMAL 2 - AC/DC

SC CONT - SCS

MAN ATT (3) - MIN IMP

AUTO RCS SELECT - single jet (MNB)

When min impulse not req'd:

AUTO RCS SELECT (a11) - OFF

ROT CONTR PWR NORMAL 2 - OFF

cb SCS LOGIC BUS (4) - open

SCS ELEC PWR - OFF

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DATE

DATE



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C
1-4

MNVR TO COMM ATTITUDE

(+X south, earth out left
window, provides continuous
visual contact with surface
and continuous OMNI coverage)

Perform RNDZ XPNDR SELF-TEST, pg S/1-25
then RNDZ XPNDR - OFF

AOS 1
L.O. -02:08

COMM/TM PWR UP

cb INST ESS MNB - close
PWR AMP - HIGH
S-BD MODE PCM - PCM
S-BD AUX - DN VOICE BU
SCE PWR - NORM
PCM BIT RATE - LOW
TELCOM GRP 1 & 2 - AC2
Select best OMNI
Check Quad Temps

At MSFN request:

UP TLM CMD - NORM
HGA PWR - on (up) (~ 6 min)
P = 0°, Y = 290° (earth out left
window)

MSFN perform tape dump
HGA PWR - OFF
UP TLM CMD - OFF

LOS 1
L.O. -57 min

COMM/TM - OFF

INV 2 - OFF
PWR AMP - OFF
S-BD MODE PCM - OFF
SCE PWR - off (ctr)
TELCOM GRP 1 & 2 - OFF

cb INST ESS MNB - open
cb panel 5 ECS - all open

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C
1-5

AOS 2

MNVR TO RNDZ TRACK ATTITUDE

+X radially down at moon, head forward,
zero yaw. Establish orb rate & hold
att +20° (horizon ~ 20° below local
horizontal)

COMM PWR UP

INV 2 - MNB
TELCOM GRP 1 & 2 - AC2
Select best OMNI
PCM BIT RATE - HIGH
SUIT COMPRESSOR - ON (10 min)

COPY RNDZ & TEI PADS

VHF AM B - DUPLEX
Configure Audio Pnl for VHF,
Select VHF Antenna
Establish VHF with LM
INV 2 - OFF
TELCOM GRP 1 & 2 - OFF
SUIT COMPRESSOR - OFF

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L.O. -5 min	cb RNDZ XPNDR FLT BUS - close RNDZ XPNDR - HTR
L.O.	LM LIFT OFF
L.O. +20 min	RNDZ XPNDR - PWR *If no VHF contact with LM * * call MSFN on S-BD, pg C/1-4*
L.O. +50 min	RNDZ XPNDR - HTR *If plane change req'd, * * leave XPNDR on *
L.O. +01:00	LM CSI BURN
L.O. +01:30	RNDZ XPNDR - PWR
L.O. +02:00	LM CDH BURN

DATE

Install DOCKING TARGET



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C
1-6

CHECK RCS QUAD TEMPS

cb INST ESS MNB - close

If any Quad < 60°:

RCS HTR - on until > 60°

to heat B or D: FC2 MNA - on (up)

cb INST ESS MNB - open

Braking -10 min

L.O. + 03:11

DAMP SC RATES

INV 2 - MNB

SUIT COMPRESSOR - ON (10 min)

cb SCS LOGIC BUS (4) - close

SCS ELEC PWR - ECA

ROT CONTR PWR NORMAL 2 - AC/DC

FC 2 MNA - on (up)

BMAG PWR 1 - ON (wait 90 sec)

FDAI/GPI PWR - 1

BMAG MODE (3) - RATE 1

AUTO RCS SELECT (16) - MNA or MNB

PRE-DOCKING

BMAG PWR 2 - ON

(wait 90 sec)

BMAG MODE (3) - ATT 1/RATE 2

MAN ATT (3) - RATE CMD

TRANS CONTR PWR - on (up)

DOCKING TARGET - BRIGHT

cb DOCK PROBE (2) - close

PROBE RETR (2) - OFF (verify)

PROBE EXTD/REL - RETR

cb SECS ARM - close

SECS LOGIC (2) - on (up)

SECS PYRO ARM (2) - ARM

RNDZ XPNDR - OFF

DOCKING

At capture:

MAN ATT (3) - MIN IMP

DOCK PROBE RETRACT - SEC-1

DATE

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C
1-7

POST-DOCKING

SECS PYRO ARM (2) - SAFE
SECS LOGIC (2) - OFF
cb SECS ARM (2) - open
DOCKING TARGET - OFF
AUTO RCS SELECT (all) - OFF
RHC PWR NORMAL 2 - OFF
BMAG PWR (2) - OFF
FDAI/GPI PWR - OFF
SCS ELEC PWR - OFF
cb SCS LOGIC BUS (4) - open
INV 2 - OFF

Pressurize tunnel from LM
Open Hatch
VHF DUPLEX - OFF

AOS 4
L.O. +03:36

Report Docking from LM

LM TO CSM POWER TRANSFER
Connect LM/CSM Umbilicals

cb LM PWR 1 MNB - close
cb LM PWR 2 MNB - close
Verify total amperage < 25
After LM configured for PWR Transfer:
LM PWR - CSM

Note: LM/CSM Umbilical is "Hot"
Main Bus Voltage may be monitored by
selecting MNB

cb G/N IMU HTR (2) - close (verify)

LM MNVR TO CSM ALIGN/COMM ATT AND HOLD

LOS -20 MIN

COMM/TM PWR UP
INV 2 - MNB
TELCOM GRP 1 & 2 - AC2
Select best OMNI
S-BD MODE PCM - PCM
PCM BIT RATE - LOW
PWR AMP - HIGH

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C
1-8

COPY TEI PAD UPDATE

G&N PWR UP

PRO, push (~ 5 sec) until STBY Lt off
F37 OOE

Verify OMNI

UP TLM - CMD RSET, then NORM

UP TLM CM - ACCEPT (State Vector (V66),
Clock Increment;
Actual & Preferred (TEI)
REFSMAT, TEI Burn Pad)

(229) Perform P30 pg G/4-1
cb TIMERS (2) - close
Set DET

TIG -50 min cb IMU (2) - close
G/N PWR IMU - on (up) (wait 90 sec)
Perform DOCKED IMU ALIGN
 CM(OGA)r = 300° - LM OGA + $\Delta\theta$
 CM(IGA)p = LM IGA $\pm 180^\circ$
 CM(MGA)y = 360° - LM MGA

V41 N20E, OG____, IG____, MG____

V40E (free platform)

Set REFSMFLG:

V25 N7E, 77E, 10000E, 1E

Set DRIFTFLG:

V37E 51E, PRO, V37E OOE

DATE

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C
1-9

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*If G&N failed: *
*TIG-30 min *
*or sunset *
* SCS PWR UP *
* FC 2 MNA - on (up) *
* SCS LOGIC BUS (4) - close *
* SCS ELEC PWR - GDC/ECA *
* BMAG PWR (2) - ON *
* (wait 90 sec) *
* FDAI/GPI PWR - 1 *
* FDAI SELECT - 1 *
* *
* MNVR TO ALIGNMENT ATTITUDE *
* cb OPTICS (2) - close *
* G/N PWR - AC 2 *
* G/N PWR OPTICS - on (up) *
* *
* ALIGN GDC *
* (Use technique recommended by *
* MSFN) *
* G/N PWR (AC) - OFF *
* G/N PWR OPTICS - OFF *
*LOS *
* COMM/TM - OFF *
* PWR AMP - OFF *
* S-BD MODE PCM - OFF *
* SCE PWR - off (ctr) *
* TELCOM GRP 1 & 2 - OFF *
* *
*Go to SPS TEI (SCS w/G&N Failed), *
* pg C/1-25 *

```

DATE 8/29/72

DATE

Sunset

```

cb OPTICS (2) - close (verify)
G/N PWR - AC 2
G/N PWR OPTICS - on (up)
OPT ZERO - OFF
OPT ZERO - ZERO (15 sec)
OPT ZERO - OFF
Perform P52 (option 1)
MSFN supply optics angles for stars

G/N PWR OPTICS - OFF
G/N PWR (AC) - OFF

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C
1-10

LOS 4 TELCOM GRP 1 & 2 - OFF
 S-BD MODE PCM - OFF
 PWR AMP - OFF

LM MNVR TO BURN ATTITUDE
*If LM JETTISON req'd: *
* use LM JETT PROCEDURES, pg C/6-1*

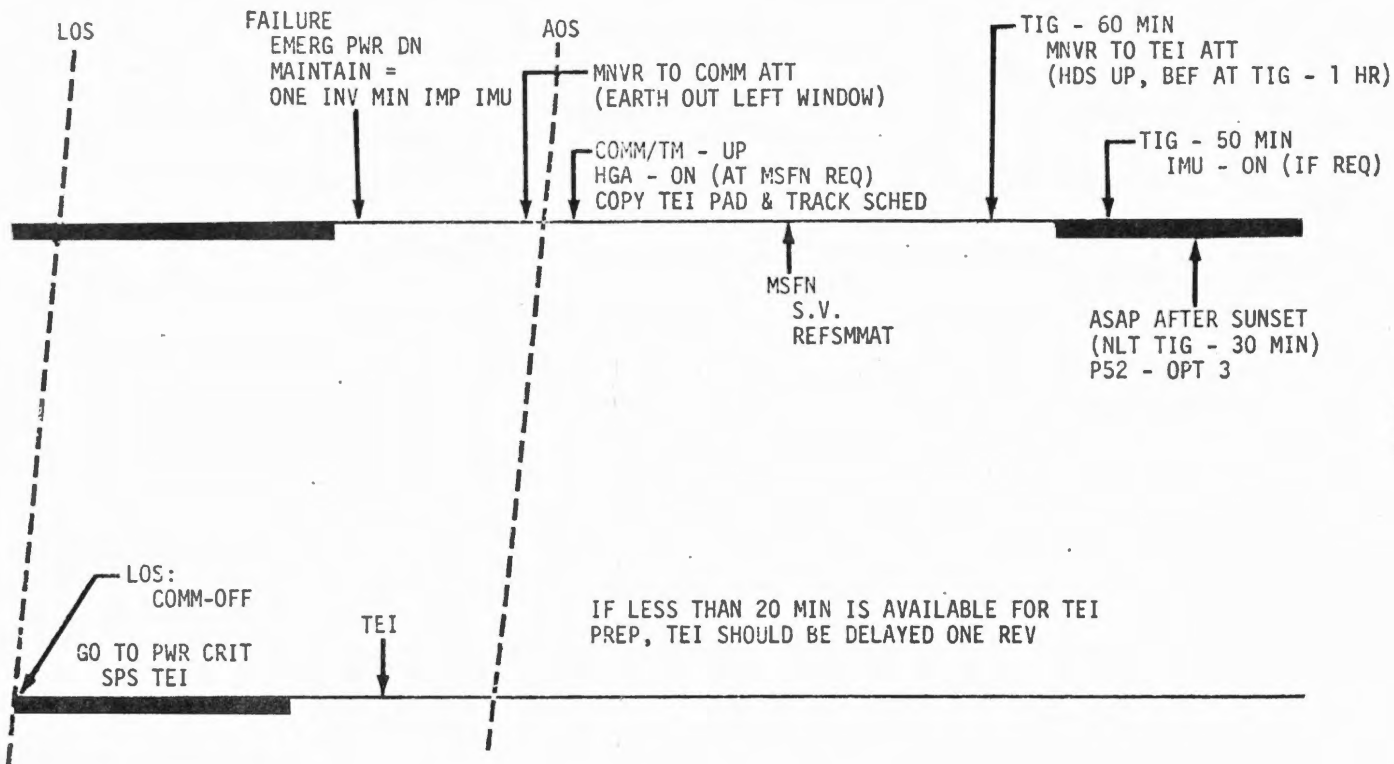
TIG -30 min DC IND SEL - MNA
 FC 2 MNA - on (up)
 DC volts > 26.5 vdc
 BMAG PWR 1 - WARMUP

Go to SPS TEI (G&N/SCS), pg C/1-17

DATE _____

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1-11
6

CSM POWER CRITICAL (POST LM JETTISON)

POST LM JETT

BACK

COLOR _____

C
1-12

POST LM JETT

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DATE 8/29/72

C
1-13

POST LM JETTISON - TEI PREP

FAILURE Perform EMERG PWR DOWN, pg EMER/1-6

Verify power on MNB

AC BUS PWR UP

INV 2 - MNB

INV 2 AC1 & AC2 - on (up)

AC1 & AC2 RSET - RSET, on

Verify AC volts > 110 vac

ENABLE MIN IMPULSE (CMC or SCS)

If AC Inverter on for COMM,

* use SCS min impulse *

CMC MIN IMPULSE (~ 3 amp)

PRO, push (~ 5 sec)

F37 00E

SC CONT - CMC/FREE

ROT CONTR PWR NORMAL 2 - AC/DC

AUTO RCS SELECT - single jet (MNB)

When min impulse not req'd:

AUTO RCS SELECT (all) - OFF

ROT CONTR PWR NORMAL 2 - OFF

V37E 06E

PRO, push (~ 5 sec) until DSKY blanks

or SCS MIN IMPULSE (~ 1 amp)

INV 2 - MNB (~ 5 amp)

cb SCS LOGIC BUS (4) - close

SCS ELEC PWR - ECA

ROT CONTR PWR NORMAL 2 - AC/DC

SC CONT - SCS

MAN ATT (3) - MIN IMP

AUTO RCS SELECT - single jet (MNB)

When min impulse not req'd:

AUTO RCS SELECT (all) - OFF

ROT CONTR PWR NORMAL 2 - OFF

cb SCS LOGIC BUS (4) - open

SCS ELEC PWR - OFF

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DATE

C
1-14

MNVR TO COMM ATTITUDE
(earth out left window)

AOS 1

COMM/TM PWR UP
cb INST ESS MNB - close
PWR AMP - HIGH
S-BD MODE PCM - PCM
S-BD AUX - DN VOICE BU
SCE PWR - NORM
PCM BIT RATE - LOW
TELCOM GRP 1 & 2 - AC2
Select best OMNI
Check Quad Temps

At MSFN request:

UP TLM CMD - NORM
HGA PWR - on (up) (~ 6 min)
P = 0°, Y = 290° (earth out left window)
MSFN perform tape dump
HGA PWR - OFF
UP TLM CMD - OFF

COPY TEI PAD & TRACKING SCHEDULE

G&N PWR UP
PRO, push (~ 5 sec)
F37 OOE
Verify OMNI
UP TLM - CMD RSET, then NORM
UP TLM CM - ACCEPT (State Vector (V66),
Clock Increment
Actual REFSMMAT,
TEI Burn Pad)

DATE

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DATE

(229) Perform P30 pg G/4-1
cb TIMERS (2) - close
Set DET



C
1-15

Before sunset MNVR TO APPROXIMATE TEI INERTIAL ATTITUDE
(Hds up, BEF ~ 1 hr before TIG)

TIG -50 min cb IMU (2) - close
 G/N PWR IMU - on (up) (wait 90 sec)

Set REFSMFLG:
 V25 N7E, 77E, 10000E, 1E
Set DRIFTFLG:
 V37E 51E, PRO, V37E 00E

- *If G&N failed: *
- *TIG -30 min *
- *or sunset *
- * SCS PWR UP *
- * FC 2 MNA - on (up) *
- * SCS LOGIC BUS (4) - close *
- * SCS ELEC PWR - GDC/ECA *
- * BMAG PWR (2) - ON *
- * (wait 90 sec) *
- * FDAI/GPI PWR - 1 *
- * FDAI SELECT - 1 *

- * MNVR TO ALIGNMENT ATTITUDE *
- * cb OPTICS (2) - close *
- * G/N PWR - AC 2 *
- * G/N PWR OPTICS - on (up) *

- * ALIGN GDC *
- * (Use technique recommended *
- * by STDN) *
- * G/N PWR (AC) - OFF *
- * G/N PWR OPTICS - OFF *

- *LOS *
- * COMM/TM - OFF *
- * PWR AMP - OFF *
- * S-BD MODE PCM - OFF *
- * SCE PWR - off (ctr) *
- * TELCOM GRP 1 & 2 - OFF *

- *Go to SPS TEI(SCS w/G&N failed),*
- * pg C/1-25 *

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C
1-16

LOS

PWR AMP - OFF
S-BD MODE PCM - OFF
SCE PWR - off (ctr)
TELCOM GRP 1 & 2 - OFF

cb INST ESS MNB - open

TIG -30 min
or sunset

DC IND SEL - MNA
FC 2 MNA - on (up)
DC volts > 26.5 vdc
BMAG PWR 1 - WARMUP
cb SCS LOGIC BUS (4) - close
FDAI/GPI PWR - 1

cb OPTICS (2) - close (verify)
G/N PWR - AC 2
G/N PWR OPTICS - on (up)
OPT ZERO - OFF
OPT ZERO - ZERO (15 sec)
OPT ZERO - OFF
Perform P52 (option 3)
(expect long gyro torque)
Repeat P52

G/N PWR OPTICS - OFF
G/N PWR (AC) - OFF

Go to SPS TEI (G&N/SCS), pg C/1-17

DATE

8/29/72
DATE

C
1-17

SPS TEI G&N/SCS

Assumes CSM POWER CRITICAL TEI PREP has
been performed

+35:00
(-25:00)

P40 - SPS THRUSTING

Prethrust Program Complete
FLOOD Lts - as req'd
CMC & ISS - on
TEST C/W LAMPS
SPS GAUGING - AC1
PUG MODE - NORM
OXID FLOW vlv - PRI
CMC MODE - FREE
AUTO RCS SELECT (16) - as req'd
LOAD DAP (check roll jets)
(A=1 & total mass in R1 of N47)
ROT CONTR PWR NORM (2) - AC/DC
Set DET
V37E 00E

LM GO TO FREE
SC CONT - CMC/AUTO

DATE 8/29/72

1

MNVR TO PAD BURN ATT
V49E

2

SXT STAR CHECK
G/N PWR OPTICS - on (up)
G/N PWR - AC2
OPT ZERO - OFF, then ZERO (15 sec)
OPT ZERO - OFF
OPT MODE - CMC
CHECK SXT STAR (V41 N91E)
OPT ZERO - ZERO
G/N PWR OPTICS - OFF
G/N PWR (AC) - OFF

3

V37E 40E
(TFI available via N40, N45 or N35)

SPS TEI - G&N/SCS

BACK

COLOR _____

C
1-18

4 F 50 18 REQUEST MNVR TO FDAI RPY ANGLES (.01°)
(AUTO) SC CONT - CMC/AUTO
PRO

5 06 18 AUTO MNVR TO FDAI RPY ANGLES (.01°)

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

+50:00m
(-10:00)

cb INV PWR 1 MNA - close
cb INV CONT 1 - close
INV 1 - MNA
INV 2 AC1 - OFF
INV 1 AC1 - on (up)
cb SCS LOGIC BUS (4) - close
SCS ELEC PWR - GDC/ECA
BMAG PWR (2) - ON
FDAI/GPI PWR - BOTH
GDC ALIGN

TVC CHECK & PREP

(8) cb STAB CONT SYS (all) - close
cb SPS (12) - close
Perform EMS ΔV TEST & NULL BIAS
CHECK, pg G/2-5, if desired
Set ΔVC
EMS FUNC - ΔV
MAN ATT (3) - RATE CMD
ATT DB - MIN
RATE - LOW
SCS TVC (2) - RATE CMD
ΔV CG - CSM (with or without A/S)
TVC GMBL DRIVE P&Y - AUTO

+54:00m
(-06:00)

(275) cb MNA BAT BUS A - close (verify)
cb MNB BAT C - close
cb MNB BAT BUS B - close (verify)
cb BAT CHGR BAT A & B (2)-close(verify)
(5) MN BUS TIE (2) - ON
SPS He vlv (2) - AUTO (verify)
Check N2A and N2B
FC 2 MNB - OFF
TVC SERVO PWR #1 - AC1/MNA
TVC SERVO PWR #2 - AC2/MNB

SPS TEI - G&N/SCS

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C
1-19

ROT CONTR PWR NORMAL (2) - AC
ROT CONT PWR DIRECT (2) - OFF
BMAG MODE (3) - ATT1/RATE 2
SC CONT - SCS
RHC #2 - ARMED

55:00m
(-05:00)

PRIMARY TVC CHECK

GMBL MOT P1-Y1 - START/ON (LMP Cnfrm)
Verify TRIM CONTROL & SET
Verify MTVC
IF SCS: SCS TVC (2) - AUTO
SC CONT - CMC (SCS)
THC - CW
Verify NO MTVC

SEC TVC CHECK

GMBL MOT P2-Y2 - START/ON (LMP Cnfrm)
Set GPI TRIM
Verify MTVC
THC NEUTRAL
Verify NO MTVC
Verify GPI returns to 0,0(CMC)
or trim (SCS)
ROT CONT PWR NORM (2) - AC/DC
ROT CONT PWR DIRECT (2) - MNA/MNB
BMAG MODE (3) - RATE 2
PRO
BMAG MODE (3) - ATT1/RATE 2
ENTR

(TRIM)

DATE 8/29/72

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

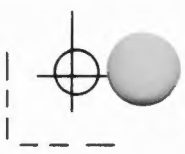
DATE

Monitor GPI Response:
00,02,-02,00,02,-02,00, Trim

*TEST FAIL: *
*SC CONT - SCS *
SCS TVC (2) - AUTO



(TRIM FRONT PAGE ON SOLID CROP MARKS: BACK PAGE ON DASH CROP MARKS.)



C
1-20

(REJECT) ENTR

8 06 40 TFI, VG, ΔVM (min-sec,.1fps)
PROG ALARM - TIG Slipped
*V5N9E 01703 *
*KEY RLSE TO 8 *

FDAI SCALE - 5/1
RATE - HIGH
UPDATE DET

59:00
(-01:00)

EMS MODE - NORMAL
TRANS CONT PWR - ON
ΔV THRUST A(B) - NORMAL
THC - ARMED
RHC (2) - ARMED
(5) cb INST ESS (2) - close
SCE PWR - NORM
TELCOM GRP 1 & 2 - AC2
TAPE RCDR - HBR/RCD/FWD/CMD RESET

59:25
(-00:35)

DSKY BLANKS

59:30
(-00:30)

(AVE G ON)

06 40

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

59:XX
(-00:XX)

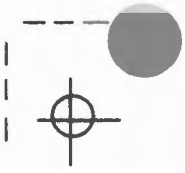
ULLAGE

*If no ULLAGE: *
* DIR ULLAGE PB - PUSH*
* Control Att with RHC*

MONITOR ΔVM (R3) COUNTING UP

DATE

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(TRIM FRONT PAGE ON SOLID CROP MARKS: BACK PAGE ON DASH CROP MARKS.)

C
1-21

59:55
(-00:05)

F 99 40 ENG ON ENABLE REQUEST
(AUTO IGN) PRO AT TFI > 0 Sec
(BYPASS IGN) ENTR to 11 (perform switching in 10)
EXIT - V37E 00E

9 00:00 IGN *IF SCS: THRUST PB - PUSH*

06 40 TFC, VG, ΔVM (min-sec,.1fps,.1fps)

*F 97 40 SPS Thrust fail *
*ΔV THRUST B(A) - NORMAL *
*(CONT GUID) PRO to 06 40 *
(RECYCLE) ENTR to TIG-05sec

00:03 SPS THRUST Lt - ON
ΔV THRUST B(A) - NORMAL
IF SCS: +X & THRUST PB - PUSH

MONITOR THRUSTING
Pc 95-105 psia
EMS COUNTING DOWN
SPS INJ VLVS (4) - OPEN
SPS He vlvs tb - gray
SPS FUEL/OXID PRESS - 170-195 psia
PUGS - BALANCED

XX:XX ECO

10 16 40 TFC (STATIC), VG, ΔVM (min-sec,.1fps)
ΔV THRUST A&B - OFF

VERIFY THRUST OFF
SPS INJ VLVS (4) - CLOSED
SPS He vlvs tb (2) - bp
GMBL MTRS (4) - OFF (LMP Confirm)
TVC SERVO PWR 1&2 - OFF

PRO

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DATE

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C
1-22

11 F 16 85 VG XYZ (CM) (.1fps)

NULL RESIDUALS
RHC & THC - LOCKED
TRANS CONT PWR - OFF
ROT CONTR PWR DIRECT (2) - OFF
cb DIRECT ULLAGE (2) - open
cb SPS P1 & Y1 - open
RECORD ΔV COUNTER & RESIDUALS ΔVC _____
EMS FUNC - OFF VGX _____
EMS MODE - STBY VGY _____
PRO VGZ _____
ATT DB - MAX
BMAG MODE (3) - RATE 2
FC 2 MNB - on (up)
(275) cb MNA BAT BUS A - open
cb MNB BAT C - open
cb MNB BAT BUS B - open
PCM BIT RATE - LOW
TAPE RCDR - off (ctr)

12 F 37 V82E

13 F 16 44 HA,HP,TFF (.1nm,min-sec)

PRO

14 F 37 00E

When COMP ACTY 1t out:
V66E

DATE _____

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C
1-23

INV 1 AC1 - OFF
INV 2 AC1 - on (up)
INV 1 - OFF

SUIT COMPRESSORS - ON (10 min each hr)

MNVR TO COMM/PTC ATT

V49E
Load GMBL angles, PRO
PRO (start mnvr)
V16 N20E (monitor mnvr)
KEY REL
ENTR (completion of mnvr)

Perform EMERG PWR DOWN, Pg EMER/1-6:
except COMM & G&N

AUTO RCS SELECT - single jet
(allow rates to damp for 20 min)

AOS

COMM/TM PWR UP (10 min track)

PWR AMP - HIGH
S-BD MODE PCM - PCM
S-BD AUX - DN VOICE BU

At MSFN request:

UP TLM CMD - NORM
HGA PWR - on (up) (~ 6 min)
MSFN perform tape dump
HGA PWR - OFF
UP TLM CMD - OFF

COMM/TM - OFF

INV 2 - OFF
SCE PWR - off (ctr)
TELCOM GRP 1 & 2 - OFF
PWR AMP - OFF

Set up G/N PTC

Complete EMERG PWR DOWN, Pg EMER/1-6

Establish DORMANT CONFIGURATION, Pg C/2-1

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C
1-24

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C
1-25

SPS TEI-SCS w/G&N FAILED

Assumes TEI PREP
has been performed

MNVR TO BURN ATTITUDE

FLOOD LTS - as req'd

50:00
(-10:00)

POWER UP 2nd INVERTER

INV 1 - MNA
INV 2 AC1 - OFF
INV 1 AC1 - on (up)

Perform EMS ΔV TEST & NULL BIAS
CHECK, pg G/2-5, if desired
Set ΔVC
EMS FUNC - ΔV

TVC CHECK & PREP

- (8) cb STAB CONT SYS (all) - close
- cb SPS (12) - close
- MAN ATT (3) - RATE CMD
- LIMIT CYCLE - on (up)
- ATT DB - MIN
- RATE - LOW
- BMAG MODE (3) - ATT 1/RATE 2
- SCS TVC (2) - RATE CMD
- ΔV CG - CSM (with or without A/S)
- TVC GMBL DRIVE P&Y - AUTO
- AUTO RCS SEL (RING 2) - MNB
- (275) cb MNA BAT BUS A - close (verify)
- cb MNB BAT C - close
- cb MNB BAT BUS B - close (verify)
- (5) cb BAT CHGR A&B (2) - close (verify)

DATE 8/29/72

SCS w/G&N FAILED

BACK

COLOR _____

C
1-26

54:00
(-06:00)

MN BUS TIE (2) - ON
FC 2 MNB - OFF
SPS He vlv (2) - AUTO (verify)
Check N2A and N2B
TVC SERVO PWR #1 - AC1/MNA
TVC SERVO PWR #2 - AC2/MNB
ROT CONTR PWR NORMAL (2) - AC
ROT CONT PWR DIRECT (2) - OFF
RHC #2 - ARMED

55:00
(-05:00)

PRIMARY TVC CHECK
GMBL MOT P1-Y1 - START/ON (LMP Cnfrm)
Verify TRIM CONTROL & SET
Verify MTVC
SCS TVC (2) - AUTO
THC - CW
Verify NO MTVC

SEC TVC CHECK
GMBL MOT P2-Y2 - START/ON (LMP Cnfrm)
Set GPI TRIM
Verify MTVC
THC NEUTRAL
Verify GPI returns to trim
Verify NO MTVC
ROT CONT PWR NORMAL (2) - AC/DC
ROT CONT PWR DIRECT (2) - MNA/MNB
FDAI SCALE - 5/1
LIMIT CYCLE - OFF
UPDATE DET

59:00
(-01:00)

EMS MODE - NORMAL
TRANS CONT PWR - ON
 Δ V THRUST A (B) - NORMAL
THC - ARMED
RHC (2) - ARMED
(5) cb INST ESS (2) - close
SCE PWR - NORM
TELCOM GRP 1&2 - AC2
TAPE RCDR - HBR/RCD/FWD/CMD RESET

DATE 8/29/72

SCS w/G&N FAILED

(TRIM FRONT PAGE ON SOLID CROP MARKS: BACK PAGE ON DASH CROP MARKS.)

C
1-27

59:XX
(-00:XX)

ULLAGE

00:00

THRUST ON PB - PUSH
SPS THRUST Lt - ON

00:03

ΔV THRUST B (A) - NORMAL
ULLAGE & THRUST ON PB - PUSH

XX:XX

ECO

ΔV THRUST A&B - OFF
GMBL MTRS (4) - OFF (LMP Confirm)
TVC SERVO PWR 1&2 - OFF
TRANS CONT PWR - OFF
ROT CONTR PWR DIRECT (2) - OFF
RECORD ΔVC _____
EMS FUNC - OFF
EMS MODE - STBY
ATT DB - MAX
BMAG MODE (3) - RATE 2
FC 2 MNB - on (up)
cb MNA BAT BUS A - open
cb MNB BAT C - open
cb MNB BAT BUS B - open
PCM BIT RATE - LOW
TAPE RCDR - off (ctr)

INV 1 AC1 - OFF
INV 2 AC1 - on (up)
INV 1 - OFF

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DATE

C
1-28

SUIT COMPRESSORS - ON (10 min ea hr)

MNVR TO COMM/PTC ATT

Perform EMERG PWR DOWN, Pg EMER/1-6:
except COMM & SCS

AUTO RCS SELECT - single jet
(allow rates to damp for 20 min)

AOS

COMM/TM PWR UP (10 min track)

PWR AMP - HIGH

S-BD MODE PCM - PCM

S-BD AUX - DN VOICE BU

At MSFN request:

UP TLM CMD - NORM

HGA PWR - on (up) (~ 6 min)

MSFN perform tape dump

HGA PWR - OFF

UP TLM CMD - OFF

COMM/TM - OFF

INV 2 - OFF

SCE PWR - off (ctr)

TELCOM GRP 1&2 - OFF

PWR AMP - OFF

Set up SCS PTC, pg G/8-3
(use couples for roll rate)

Complete EMERG PWR DOWN,
pg EMER/1-6

Establish DORMANT CONFIGURATION,
pg C/2-1

DATE

8/29/72

DATE

Post Before Page C/2-1

DATE 8/29/72

CSM POWER CRITICAL COASTING

CSM POWER CRITICAL COASTING

BACK

COLOR _____

DATE 8/29/72

C
2-1

CSM POWER CRITICAL COASTING

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44

DORMANT CONFIGURATION LIST

PANEL 13 (ORDEAL)

FDAI sw (2) - INRTL
EARTH/LUNAR - PWR OFF
ALT SET - 60
LTG - OFF
MODE - HOLD/FAST

PANEL 15

COAS PWR - OFF
UTIL PWR - OFF
PL BCN LT - off (center)
PL VENT - OFF

PANEL 325

CAB PRESS RELF vlv (2) - NORMAL
PRIM GLY TO RAD vlv - BYPASS (pull)

PANEL 326

REPRESS PKG vlv - OFF
SM O2 SUPPLY vlv - OPEN
SURGE TK O2 vlv - OFF
GLY RSVR IN vlv - CLOSE
GLY RSVR BYPASS vlv - OPEN
GLY RSVR OUT vlv - CLOSE

PANEL 380

O2 DEMAND REG vlv - OFF
SUIT TEST vlv - OFF
SUIT CKT RET vlv - open (pull)

PANEL 7

EDS PWR - OFF
SCS TVC SERVO PWR #1 & #2 (2) - OFF
FDAI/GPI PWR - OFF
LOGIC 2/3 PWR - on (up)
SCS ELEC PWR - OFF
SCS SIG CONDR/DR BIAS 1 & 2 (2) - OFF
BMAG PWR (2) - OFF
DIRECT O2 vlv - close (CW)

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DORMANT CONFIG LIST

BACK

COLOR _____

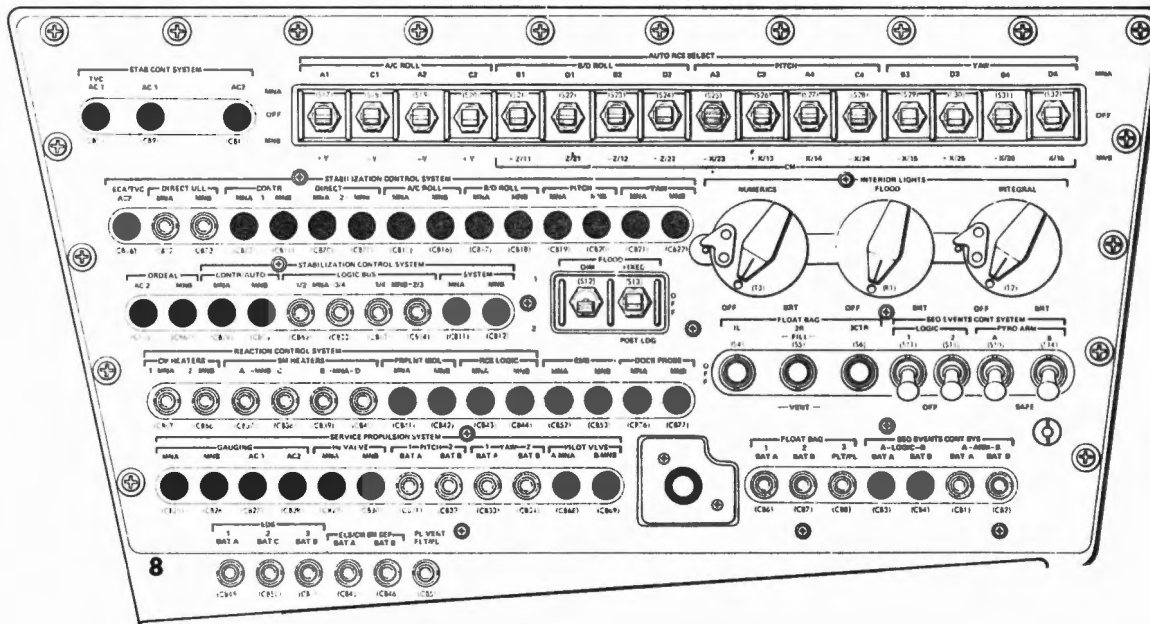
C
2-2

DORMANT CONFIG LIST

- 1 PANEL 8
- 2 cb Panel 8 - see diagram C/2-3
- 3 AUTO RCS SEL (16) - OFF
- 4 INT NUM LT - OFF
- 5 INT INTGL LT - OFF
- 6 INT FLOOD LT - OFF
- 7 FLOOD LTS DIM - 1
- 8 FLOOD LTS FIXED - OFF
- 9 FLOAT BAG (3) - OFF (locked)
- 10 SECS LOGIC (2) - OFF (locked)
- 11 SECS PYRO ARM (2) - SAFE (locked)
- 12
- 13 PANEL 9, 6, 10
- 14 MODE (3) - INTERCOM/PTT
- 15 PAD COMM (3) - OFF
- 16 S BD (3) - T/R
- 17 PWR (3) - OFF
- 18 INTERCOM (3) - T/R
- 19 VHF AM (3) - T/R
- 20 AUDIO CONT (3) - NORM
- 21 SUIT PWR (3) - OFF
- 22
- 23 PANEL 1
- 24 EMS FUNC sel - OFF
- 25 EMS MODE - STBY
- 26 CMC ATT - IMU
- 27 FDAI SCALE - 5/1
- 28 FDAI SEL - 1/2
- 29 FDAI SOURCE - ATT SET
- 30 ATT SET - GDC
- 31 MAN ATT ROLL, PITCH & YAW (3) - MIN IMP
- 32 LIM CYCLE - on (up)
- 33 ATT DBD - MAX
- 34 RATE - LOW
- 35 TRANS CONTR PWR - OFF
- 36 RHC PWR NORM (2) - OFF
- 37 RHC PWR DIR (2) - OFF
- 38 SC CONT - SCS
- 39 CMC MODE - FREE
- 40 BMAG MODE ROLL, PITCH & YAW (3) - RATE 2
- 41 SPS THRUST - NORMAL (lock)
- 42 Δ V THRUST (2) - OFF (down) (guarded)
- 43 SCS TVC PITCH & YAW (2) - RATE CMD
- 44

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DATE 8/29/72



- - CLOSE
- ⊙ - OPEN

DATE _____

2-3
C

C
2-4

- 1 SPS GMBL MOT PITCH & YAW (4) - OFF
- 2 ΔV CG - CSM
- 3 ELS LOGIC - OFF (down) (guarded)
- 4 ELS AUTO - MAN
- 5 CM RCS LOGIC - OFF
- 6 CM PRPLNT DUMP - OFF (down) (guarded)
- 7 CM PRPLNT PURG - off (down) (guarded)
- 8 EMS ROLL - OFF
- 9 .05G sw - OFF
- 10 α/Pc IND sw - Pc
- 11 LV/SPS IND - GPI
- 12 TVC GMBL DR PITCH & YAW (2) - AUTO
- 13 EVNT TMR STRT - STOP
- 14
- 15 PANEL 2
- 16 PRPLNT DUMP - RCS CMD
- 17 EDS AUTO - OFF
- 18 SM RCS HTRS (4) - OFF
- 19 UP TLM CM - BLOCK
- 20 PROBE EXTD/REL - OFF (guarded)
- 21 DOCK PROBE RETR PRIM & SEC (2) - OFF
- 22 EXT RUN/EVA LT - OFF
- 23 EXT RNDZ LT - off (center)
- 24 TUNL LT - OFF
- 25 LM PWR - OFF
- 26 PL VENT vlv - push (lock)
- 27 C/W NORM - ACK
- 28 C/W CSM - CSM
- 29 C/W PWR - 1
- 30 MSN TMR - STOP
- 31 CAB FANS - OFF
- 32 CRYO PRESS IND - SRG/3
- 33 O2 QTY IND - 3
- 34 H2 HTRS (2) - OFF
- 35 O2 HTRS (3) - OFF
- 36 H2 FANS (3) - OFF
- 37 ECS RAD FLOW AUTO CONT - AUTO
- 38 ECS RAD FLOW CONT PWR - off (center)
- 39 ECS RAD MAN SEL - RAD 1
- 40
- 41
- 42
- 43
- 44

DATE

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DATE

C
2-5

- 1 ECS RAD PRIM HTR - off (center)
- 2 ECS RAD SEC HTR - OFF
- 3 POT H2O HTR - OFF
- 4 SUIT CKT H2O ACCUM AUTO - OFF
- 5 SUIT CKT HT EXCH - off (center)
- 6 SEC COOL LOOP EVAP - off (center)
- 7 SEC COOL LOOP PUMP - off (center)
- 8 GLY EVAP TEMP IN - MAN
- 9 GLY EVAP STM PRESS AUTO - MAN
- 10 GLY EVAP H2O FLOW - off (center)
- 11 CAB TEMP - MAN
- 12 HI GAIN ANT TRACK - MAN
- 13 HI GAIN ANT BEAM - WIDE
- 14 HI GAIN ANT PWR - OFF
- 15 HI GAIN ANT SERVO ELECT - PRIM
- 16
- 17 PANEL 3
- 18 FC HTRS (3) - OFF
- 19 SPS QTY TEST - off (center)
- 20 OXID FLOW VLV INCR - as desired
- 21 OXID FLOW VLV PRIM - PRIM
- 22 PUG MODE - PRIM
- 23 FC PURG (3) - OFF
- 24 FC 1, 2 & 3 MN BUS A (3) - OFF
- 25 MN BUS A & B RSET (2) - OFF
- 26 FC 1, 2 & 3 MN BUS B (3) - OFF
- 27 SPS PRESS IND sw - He
- 28 SPS LINE HTRS - off (center)
- 29 SPS He vlv (2) - AUTO
- 30 S BD XPNDR - PRIM
- 31 S BD PWR AMPL PRIM - PRIM
- 32 S BD PWR AMPL HI - off (center)
- 33 S BD MODE VOICE - VOICE
- 34 S BD MODE PCM - off (center)
- 35 S BD MODE RNG - RNG
- 36 S BD AUX TAPE - DN VOICE BU
- 37 S BD AUX TV - off (center)
- 38 UP TLM DATA - DATA
- 39 UP TLM CMD - OFF
- 40 S BD SQUELCH - OFF
- 41 VHF RNG - OFF
- 42 VHF BCN - OFF
- 43 VHF AM RCV ONLY - off (center)
- 44

DATE 8/29/72

DATE

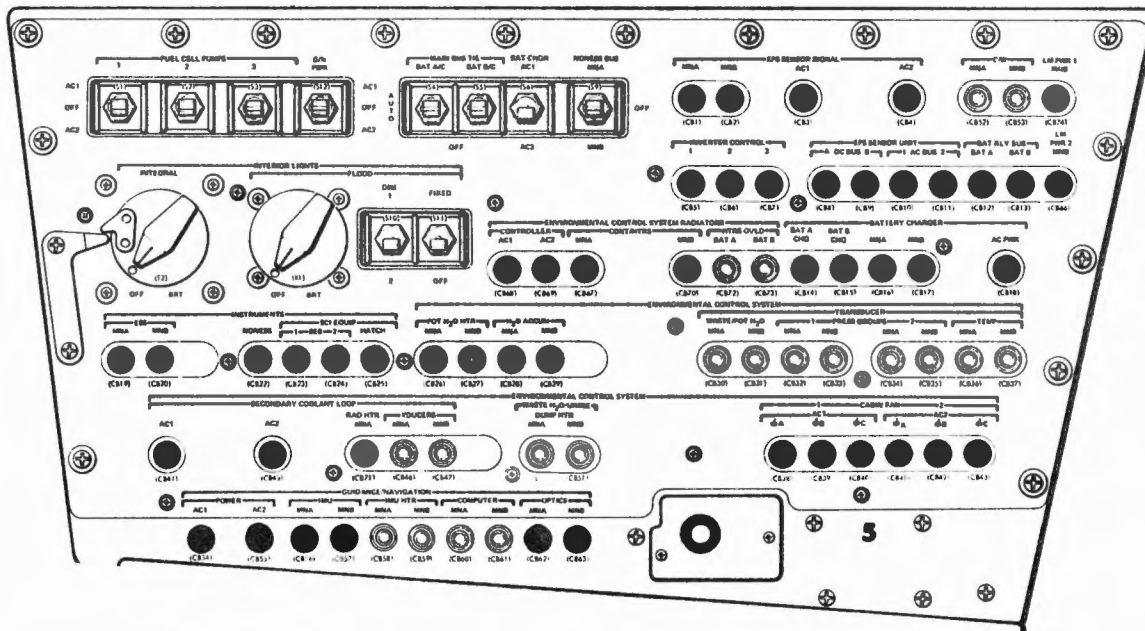
C
2-6

- 1 VHF AM A & B (2) - off (center)
- 2 FC REACS vlv - NORMAL
- 3 H2 PURG LINE HTR - OFF
- 4 TAPE RCDR PCM - PCM/ANLG
- 5 TAPE RCDR RCD - off (center)
- 6 TAPE RCDR FWD - off (center)
- 7 SCE PWR - off (center)
- 8 PMP PWR - off (center)
- 9 PCM BIT RATE - LOW
- 10 AC INV (9) - OFF
- 11 AC 1 & 2 RSET (2) - OFF
- 12 DC IND sel - FC 2
- 13 BAT CHARGE sel - OFF
- 14
- 15 PANEL 16
- 16 DOCK TRGT - OFF
- 17 UTIL PWR - OFF
- 18 COAS PWR - OFF
- 19
- 20 PANEL 5
- 21 FC 1, 2 & 3 PUMPS (3) - OFF
- 22 G/N PWR - OFF
- 23 MN BUS TIE BAT A/C - BAT A/C
- 24 MN BUS TIE BAT B/C - BAT B/C
- 25 BAT CHGR - AC 1
- 26 NONESS BUS - OFF
- 27 INT INTGL LT - OFF
- 28 INT FLOOD LT - OFF
- 29 INT FLOOD LT DIM - 1
- 30 INT FLOOD LT FIXED - OFF
- 31 cb Panel 5 - see diagram C/2-7
- 32
- 33 PANEL 4
- 34 SPS GAUGING - OFF
- 35 TELCOM GRP 1 & 2 (2) - OFF
- 36 GLY PUMPS - OFF
- 37 SUIT COMPR 1 & 2 (2) - OFF
- 38 cb Panel 4 - all closed
- 39
- 40 PANEL 278
- 41 cb Panel 278 - all open
- 42 SM PWR SOURCE - (center) (if AUX BAT configured)
- 43 EXPERIMENT COVERS (3) - off (center)
- 44

DATE

8/29/72
DATE

DATE 8/29/72



- - CLOSE
- ⊙ - OPEN

DATE _____

C
2-7

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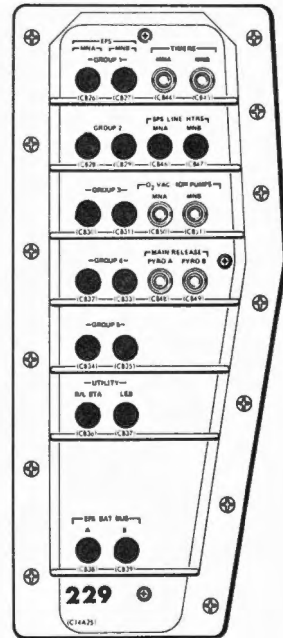
C
2-8

- 1 PANEL 277
- 2 cb Panel 277 - all open
- 3 SPS PRESS FUEL IND - 1
- 4 SPS PRESS OXID IND - 1
- 5
- 6 PANEL 276
- 7 cb Panel 276 - all open
- 8
- 9 PANEL 275
- 10 cb Panel 275 - all open except:
- 11 cb FLIGHT/PL MN A & MN B (2) - close
- 12

- 13 PANEL 229
- 14 cb Panel 229 all closed except:
- 15 cb MAIN REL PYRO (2) - open
- 16 cb O2 VAC ION PUMPS (2) - open
- 17 cb TIMERS MNA & MNB (2) - open
- 18

- 19 PANEL 230
- 20 MAP CAMERA ON - OFF
- 21 MAP CAMERA TRACK - off (center)
- 22 MAP CAMERA IMAGE MTN - OFF
- 23 LASER ALTR - OFF
- 24 DATA SYS ON - OFF
- 25 IR - OFF
- 26 LUNAR SOUNDER OPERATE - STBY
- 27 LUNAR SOUNDER HF ANT (2) - ctr
- 28 LUNAR SOUNDER RCDR - off (center)
- 29 LUNAR SOUNDER RADAR - OFF
- 30 LUNAR SOUNDER MODE - HF
- 31 PAN CAMERA MODE - STBY
- 32 PAN CAMERA SELF TEST - off (center)
- 33 PAN CAMERA PWR - off (center)
- 34 PAN CAMERA - MONO
- 35 PAN CAMERA V/h OVRD - off (center)
- 36 UV SPECT - OFF
- 37

- 38 PANEL 225
- 39 cb Panel 225 - all closed except:
- 40 cb FLT BUS MNA & MNB (2) - open
- 41 cb CTE (2) - open
- 42
- 43
- 44



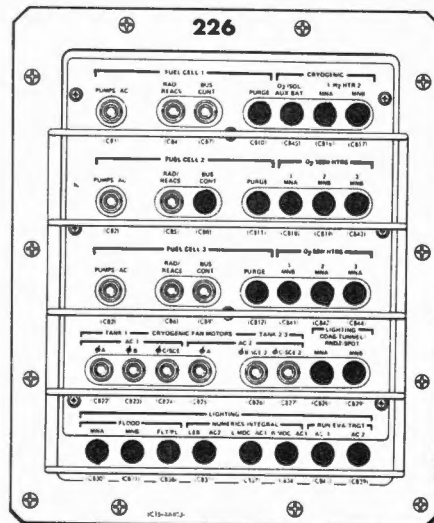
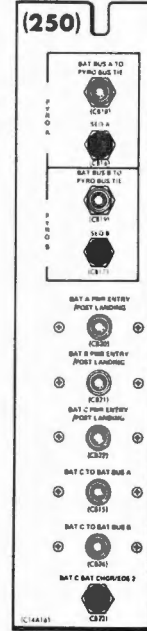
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C
2-9

- 1 PANEL 226, 250
- 2 cb Panel 226 & 250 - see diagrams right
- 3
- 4 PANEL 251
- 5 WASTE MGMT OVBD DRAIN vlv - OFF
- 6
- 7 PANEL 252
- 8 BAT VENT vlv - CLOSED
- 9 WASTE STOWAGE VENT vlv - CLOSED
- 10
- 11 PANEL 181
- 12 cb Panel 181 - all open
- 13 CRYO 3 AC PWR - OFF
- 14 SM/AC PWR - OFF
- 15 DOOR JETT - OFF (down) (guarded)
- 16 LOGIC PWR (2) - OFF
- 17
- 18 PANEL 201
- 19 AC UTIL PWR - OFF
- 20
- 21 PANEL 12
- 22 LM TUNL VENT vlv - OFF
- 23
- 24 PANEL 300, 301, 302
- 25 SUIT FLOW vlv (3) - FULL FLOW
- 26
- 27 PANEL 304
- 28 DRNK H2O SUPPLY vlv - OFF
- 29
- 30 PANEL 306
- 31 MSN TMR - STOP
- 32 EVNT TMR STRT - STOP
- 33
- 34 PANEL 101
- 35 CM RCS HTRS - OFF
- 36 WASTE H2O DUMP - OFF
- 37 UR DUMP - OFF
- 38
- 39
- 40
- 41
- 42
- 43
- 44



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DATE

C
2-10

- 1 PANEL 100
- 2 UTIL PWR - OFF
- 3 FLOOD LTS DIM - 1
- 4 FLOOD LTS FIXED - OFF
- 5 OPT PWR - OFF
- 6 IMU PWR - OFF
- 7 RNDZ XPNDR - OFF
- 8 NUMERICS LT - OFF
- 9 FLOOD LTS - OFF
- 10 INTGL LT - OFF
- 11
- 12 PANEL 122
- 13 OPT ZERO - ZERO
- 14 OPT TELTRUN - SLAVE TO SXT
- 15 OPT COUPLING - RSLV
- 16 OPT MODE - MAN
- 17 OPT SPEED - LO
- 18 COND LAMPS - OFF
- 19 UP TLM - ACCEPT
- 20
- 21 PANEL 352
- 22 WASTE TK SERVICING vlv - CLOSE
- 23 PRESS RELF vlv - 2
- 24 POT TK IN vlv - OPEN
- 25 WASTE TK IN vlv - AUTO
- 26
- 27 PANEL 351
- 28 MAIN REG vlv (2) - close
- 29 H2O/GLY TK PRESS REG vlv - OFF
- 30 EMER CAB PRESS vlv - BOTH
- 31
- 32 PANEL 382
- 33 SUIT HT EXCH PRIM GLY vlv - FLOW (CCW)
- 34 SUIT FLOW RELF vlv - OFF
- 35 GLY EVAP IN TEMP vlv - MIN (CCW)
- 36 SUIT HT EXCH SEC GLY vlv - FLOW (CCW)
- 37 SEC EVAP H2O CONT vlv - AUTO
- 38 PRIM EVAP H2O CONT vlv - AUTO
- 39 H2O ACCUM vlv (2) - RMTE
- 40
- 41 PANEL 378
- 42 PRIM GLY ACCUM vlv - open (CCW)
- 43
- 44

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DATE

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C
2-11

1 PANEL 379
2 PRIM ACCUM FILL vlv - OFF (CW)
3
4 PANEL 375
5 SURGE TK PRESS RELF vlv - open (CW)
6
7 PANEL 376
8 PLVC - NORMAL (up)
9
10 PANEL 377
11 GLY TO RAD SEC vlv - BYPASS (CCW)
12
13 PANEL 600
14 EMER 02 vlv - CLOSE
15
16 PANEL 602
17 REPRESS 02 RELF vlv - open (CW)
18
19 PANEL 601
20 REPRESS 02 vlv - CLOSE (guarded)
21
22 PANEL 603
23 EVA STA 02 SUPPLY - OFF
24
25 PANEL 604
26 SUIT PRESS ALARM - OFF
27
28 FWD HATCH
29 PRESS EQUAL vlv - CLOSE
30 ACTR HNDL sel - stow/check locked
31
32 SIDE HATCH
33 CAB PRESS DUMP vlv - close (CW)
34 GEAR BOX sel - LATCH
35 ACTR HANDLE sel - UNLATCH
36 LOCK PIN REL KNOB - LOCK
37 LOCK PIN ind - flush
38 GN2 VLV HANDLE - outboard
39 BPC JETT KNOB - 180° from BPC JETT decal
40
41
42
43
44

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DATE

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C
2-12

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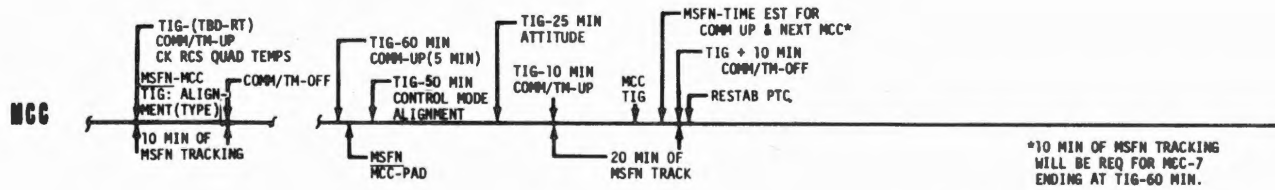


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2-13
C

MCC
COMM(TRACKING) _____:_____:_____
TIG _____:_____:_____

MCC
COMM(TRACKING) _____:_____:_____
TIG _____:_____:_____

MCC
COMM(TRACKING) _____:_____:_____
TIG _____:_____:_____

MCC
COMM(TRACKING) _____:_____:_____
TIG _____:_____:_____

MCC TIMELINE

BACK

COLOR _____

C
2-14

MCC TIMELINE

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DATE 8/29/72

C
2-15

SCS MCC - PREPARATION

Assumes DORMANT CONFIGURATION, pg C/2-1

TIG-1:00 hr

- (5) cb C/W (2) - close
- (250) cb BAT A,B&C PWR ENTRY/PL (3) - close
- (275) cb INVERTER POWER (4) - close
- (276) cb INST PWR CONT (4) - close
- (225) cb CTE (2) - close
- (229) cb TIMERS (2) - close

FC 2 MNA - on (up)
MNA RSET - RSET, on
BMAG 1 - WARMUP

If MNB not powered by LM
FC 2 MNB - on (up)
MNB RSET - RSET, on

AC BUS PWR UP
INV 2 - MNB
INV 2 AC1 & AC2 - on (up)
AC1 & AC2 RSET - RSET, on

COMM PWR UP Pg C/2-33, 1A

Check Quad Temps
If any Quad $< 60^\circ$:
cb SM RCS HTRS (4) - close
RCS HTR - on until $> 60^\circ$
Then, cb SM RCS HTRS (4) - open

COPY BURN & ALIGNMENT PADS
Set DET

COMM - OFF
TELCOM GRP 1 & 2 - OFF
PMP PWR - off (ctr)

DATE 8/29/72

SCS MCC - PREP

BACK



COLOR _____

C
2-16

SCS PWR UP
cb SCS LOGIC (4) - close
SCS ELEC PWR - GDC/ECA
BMAG PWR (2) - ON
(wait 90 sec)
FDAI/GPI PWR - 1
FDAI SELECT - 1
ROT CONTR PWR NORMAL 2 - AC/DC
AUTO RCS SEL (RING 1) - MNA

TIG - 50 min MNVR TO ALIGNMENT ATTITUDE

ALIGN GDC
(Use technique recommended by STDN)

TIG - 25 min MNVR TO BURN ATTITUDE

SCS MCC - PREP

DATE 8/29/72

C
2-17

SCS MCC - SPS ΔV

Assumes SCS MCC PREPARATION
has been performed

50:00
(-10:00)

FLOOD LTS - as req'd
SIG CONDR/DRIVER BIAS PWR - AC1
SCE PWR - NORM
PMP PWR - NORM
TELCOM GRP 1 & 2 - AC1
PWR AMP - HIGH

POWER UP 2nd INVERTER

INV 1 - MNA
INV 2 AC1 - OFF
INV 1 AC1 - on (up)

Perform EMS ΔV TEST & NULL BIAS
CHECK, pg G/2-5, if desired
Set ΔVC
EMS FUNC - ΔV

TVC CHECK & PREP

- (8) cb STAB CONT SYS (all) - close
cb SPS (12) - close
MAN ATT (3) - RATE CMD
LIMIT CYCLE - on (up)
ATT DB - MIN
RATE - LOW
BMAG MODE (3) - ATT 1/RATE 2
SCS TVC (2) - RATE CMD
ΔV CG - CSM (with or without A/S)
TVC GMBL DRIVE P&Y - AUTO
AUTO RCS SEL (RING 2) - MNB

54:00
(-06:00)

cb MNA BAT BUS A - close
cb MNB BAT C - close
cb MNB BAT BUS B - close
FC 2 MNB - OFF
SPS He vlv - AUTO (verify)
Check N2A and N2B
TVC SERVO PWR #1 - AC1/MNA
TVC SERVO PWR #2 - AC2/MNB

DATE 8/29/72

SCS MCC - SPS ΔV

BACK

COLOR _____

C
2-18

ROT CONTR PWR NORMAL (2) - AC
ROT CONT PWR DIRECT (2) - OFF
RHC #2 - ARMED

55:00
(-05:00)

PRIMARY TVC CHECK
GMBL MOT P1-Y1 - START/ON (LMP Cnfrm)
Verify TRIM CONTROL & SET
Verify MTVC
SCS TVC (2) - AUTO
THC - CW
Verify NO MTVC

SEC TVC CHECK
GMBL MOT P2-Y2 - START/ON (LMP Cnfrm)
Set GPI TRIM
Verify MTVC
THC NEUTRAL
Verify GPI returns to trim
Verify NO MTVC
ROT CONT PWR NORMAL (2) - AC/DC
ROT CONT PWR DIRECT (2) - MNA/MNB
FDAI SCALE - 5/1
LIMIT CYCLE - OFF
UPDATE DET

59:00
(-01:00)

EMS MODE - NORMAL
TRANS CONTR PWR - ON
 ΔV THRUST A (B) - NORMAL
THC - ARMED
RHC (2) - ARMED

59:XX
(-00:XX)

ULLAGE

00:00

THRUST ON PB - PUSH
SPS THRUST Lt - ON
 ΔV THRUST B (A) - NORMAL
ULLAGE & THRUST ON PB - PUSH

00:03

00:XX

ECO

ΔV THRUST A&B - OFF
GMBL MTRS (4) - OFF (LMP Confirm)
TVC SERVO PWR 1&2 - OFF

DATE 8/29/72

SCS MCC - SPS ΔV

C
2-19

TRANS CONT PWR - OFF
ROT CONTR PWR DIRECT (2) - OFF
RECORD ΔVC

EMS FUNC - OFF
EMS MODE - STBY
ATT DB - MAX
BMAG MODE (3) - RATE 2
FC 2 MNB - on (up)
cb MNA BAT BUS A - open
cb MNB BAT C - open
cb MNB BAT BUS B - open

INV 1 AC1 - OFF
INV 2 AC2 - on (up)
INV 1 - OFF

PCM BIT RATE - LOW
PWR AMP - OFF

Set up SCS PTC, pg G/8-3
(Use couples for roll rate)

STDN TRACKING (10 min)

Perform EMERG PWR DOWN, pg EMER/1-6

Establish DORMANT CONFIGURATION,
pg C/2-1

DATE 8/29/72

SCS MCC
SPS MIN PWR ΔV

BACK

COLOR _____

C
2-20

SCS SPS MIN PWR ΔV

SCS MCC
SPS MIN PWR ΔV

Assumes SCS MCC PREPARATION
has been performed

FLOOD LTS - as req'd

Perform ΔV TEST, pg G/2-5

50:00
(-10:00)

Set ΔVC
EMS FUNC - ΔV

- TVC CHECK & PREP
- (8) cb STAB CONT SYS (all) - close
 - cb SPS (12) - close
 - MAN ATT (3) - RATE CMD
 - LIMIT CYCLE - on (up)
 - ATT DB - MIN
 - RATE - LOW
 - BMAG MODE (3) - ATT 1/RATE 2
 - SCS TVC (2) - RATE CMD
 - ΔV CG - CSM
 - TVC GMBL DRIVE P&Y - 1
 - AUTO RCS SEL (RING 2) - MNB

54:00
(-06:00)

- cb MNA BAT BUS A - close
- cb MNB BAT C - close
- cb MNB BAT BUS B - close
- FC 2 MNB - OFF
- SPS He vlv (2) - AUTO (verify)
- Check N2A and N2B
- TVC SERVO PWR #1 - AC1/MNA
- ROT CONTR PWR NORMAL (2) - AC
- ROT CONT PWR DIRECT (2) - OFF
- SC CONT - SCS
- RHC #2 - ARMED

DATE 8/29/72

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C
2-21

55:00
(-05:00)

PRIMARY TVC CHECK
GMBL MOT P1-Y1 - START/ON (LMP Cnfrm)
Verify TRIM CONTROL & SET
Verify MTVC
SCS TVC (2) - AUTO
THC - CW
Verify MTVC
THC NEUTRAL
Verify GPI returns to trim
Verify NO MTVC
ROT CONT PWR NORMAL (2) - AC/DC
ROT CONT PWR DIRECT (2) - MNA/MNB
FDAI SCALE - 5/1
LIMIT CYCLE - OFF
UPDATE DET

59:00
(-01:00)

EMS MODE - NORMAL
TRANS CONT PWR - ON
 ΔV THRUST A (B) - NORMAL
THC - ARMED
RHC (2) - ARMED

59:XX
(-00:XX)

ULLAGE

00:00

THRUST ON PB - PUSH
SPS THRUST Lt - ON
 ΔV THRUST B (A) - NORMAL
ULLAGE & THRUST ON PB - PUSH

00:03

00:XX

ECO

ΔV THRUST A&B - OFF
GMBL MTRS (4) - OFF (LMP Confirm)
TVC SERVO PWR 1&2 - OFF

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DATE

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C
2-22

TRANS CONT PWR - OFF
ROT CONTR PWR DIRECT (2) - OFF
RECORD Δ VC _____
EMS FUNC - OFF
EMS MODE - STBY
BMAG MODE (3) - RATE 2
FC 2 MNB - on (up)
cb MNA BAT BUS A - open
cb MNB BAT C - open
cb MNB BAT BUS B - open

Set up SCS PTC, pg G/8-3
(Use couples for roll rate)

STDN TRACKING (10 min)

Perform EMERG PWR DOWN, pg EMER/1-6

Establish DORMANT CONFIGURATION,
pg C/2-1

DATE _____

DATE 8/29/72

C
2-23

SCS MCC - RCS ΔV

Assumes SCS MCC PREPARATION
has been performed

FLOOD LTS - as req'd

Perform ΔV TEST, pg G/2-5

50:00
(-10:00)

Set ΔVC
EMS FUNC - ΔV
MAN ATT (3) - RATE CMD
LIMIT CYCLE - on (up)
ATT DB - MIN
RATE - LOW
BMAG MODE (3) - ATT 1/RATE 2
SC CONT - SCS
RHC #2 - ARMED
ROT CONT PWR NORMAL (2) - AC/DC
ROT CONT PWR DIRECT (2) - MNA/MNB
UPDATE DET
AUTO RCS SEL (RING 2) - MNB

SCS MCC - RCS ΔV

59:00
(-01:00)

EMS MODE - NORMAL
TRANS CONT PWR - ON
THC - ARMED
LIMIT CYCLE - OFF

00:00

THC - +X and hold

00:XX

THC - release

TRANS CONT PWR - OFF
ROT CONTR PWR DIRECT (2) - OFF
RECORD ΔVC _____
EMS FUNC - OFF
EMS MODE - STBY
ATT DB - MAX
BMAG MODE (3) - RATE 2

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BACK

COLOR _____

C
2-24

Set up SCS PTC, pg G/8-3
(Use couples for roll rate)

STDN TRACKING (10 min)

Perform EMERG PWR DOWN, pg EMER/1-6

Establish DORMANT CONFIGURATION,
pg C/2-1

SCS MCC - RCS ΔV

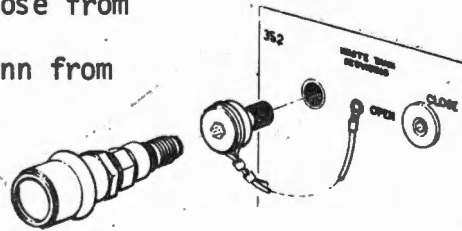
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DORMANT SYSTEMS MANAGEMENT

ECS

- 1 WATER PRESSURIZATION
MAIN REG vlv (either) - open
H2O/GLY TK PRESS REG vlv - BOTH, 1 or 2
To withdraw water cycle SURGE TK
O2 vlv as required
Water tank pressure will bleed ovbd 0.04 lb/hr after
tank isolation (1 hr full tk, 9 hrs empty tk)

- 2 WASTE WATER TRANSFER CM TO PLSS
Install H2O Adapter Assy on Waste Tank Service Port
Connect Urine Dump Hose to H2O Adapter Assy
PLSS H2O SHUTOFF & RELIEF vlv - CLOSE (verify)
Connect Urine Dump Hose to PLSS H2O FILL conn
Use Filter if Urine Dump Hose is Contaminated
Connect Urine Bag conn to PLSS H2O DRAIN conn
Cut hole in Urine Bag to Provide Vent
Pressurize CM Water Tanks (as above)
WASTE TK SERVICING vlv - OPEN (3 min) - CLOSE
SURGE TK O2 vlv - OFF
Disconnect Urine Dump Hose from
PLSS H2O FILL conn
Disconnect Urine Bag conn from
PLSS H2O DRAIN conn



ECS

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- 3 SUIT COMPRESSOR OPERATION
Configure for AC & DC MNA BUS POWER
SUIT COMPRESSOR 1 - AC 1 or AC 2
cb ECS PRESS GRP 2 MNA - CLOSE (Pn1 5)
Monitor CO2 PP <~7.5 (~15 min-ON/60 min-OFF)
Monitor Cabin Pressure (Maintain >3.0 psia)

BACK

COLOR _____

C
2-26

4 CM LiOH CANISTER UTILIZATION (IN CM)

Refer to Diagram C/2-27

Tape LM CDR Red Hose to CM Center Blue Hose

Tape LM LMP Red Hose to CM Right Blue Hose

Firmly butt together to minimize leaks

Install O2 Hose Coupling on CM Center Red Hose

Install O2 Hose Coupling on CM Right Red Hose

Install O2 Hose Coupling interconnecting CM

Left Red and Blue Hoses

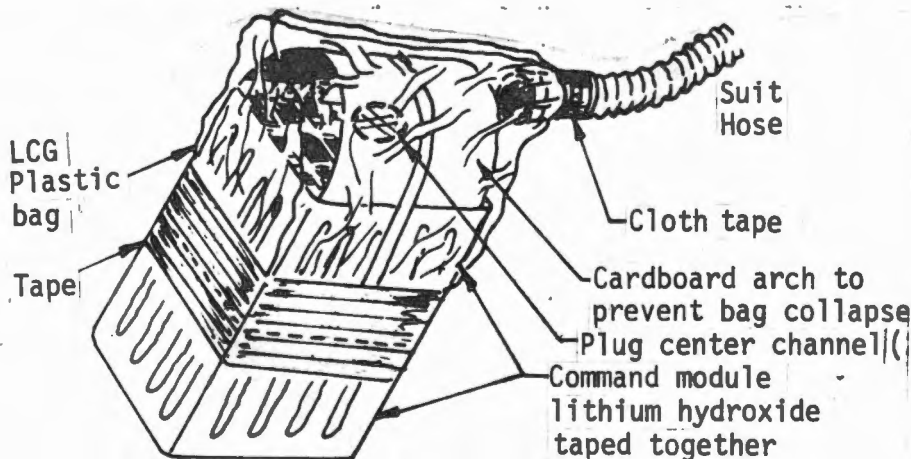
SUIT RETURN vlv - OPEN (Pull)

Remove LM LiOH Canister from ARS

Activate LM Suit Compressor

5 CM LiOH CANISTER UTILIZATION (LM BOX)

Refer to Diagram Below



ECS

DATE 8/29/72

6 METABOLIC MAKEUP WITH OPS O2

Verify OPS O2 conn Locked in STOWAGE PLATE

Cycle OPS ACTUATION LEVER as required

Flow Rate ~0.3 lb/hr.

7 OPS QUICK BLEED DOWN

Verify OPS O2 ACTUATION LEVER - OFF

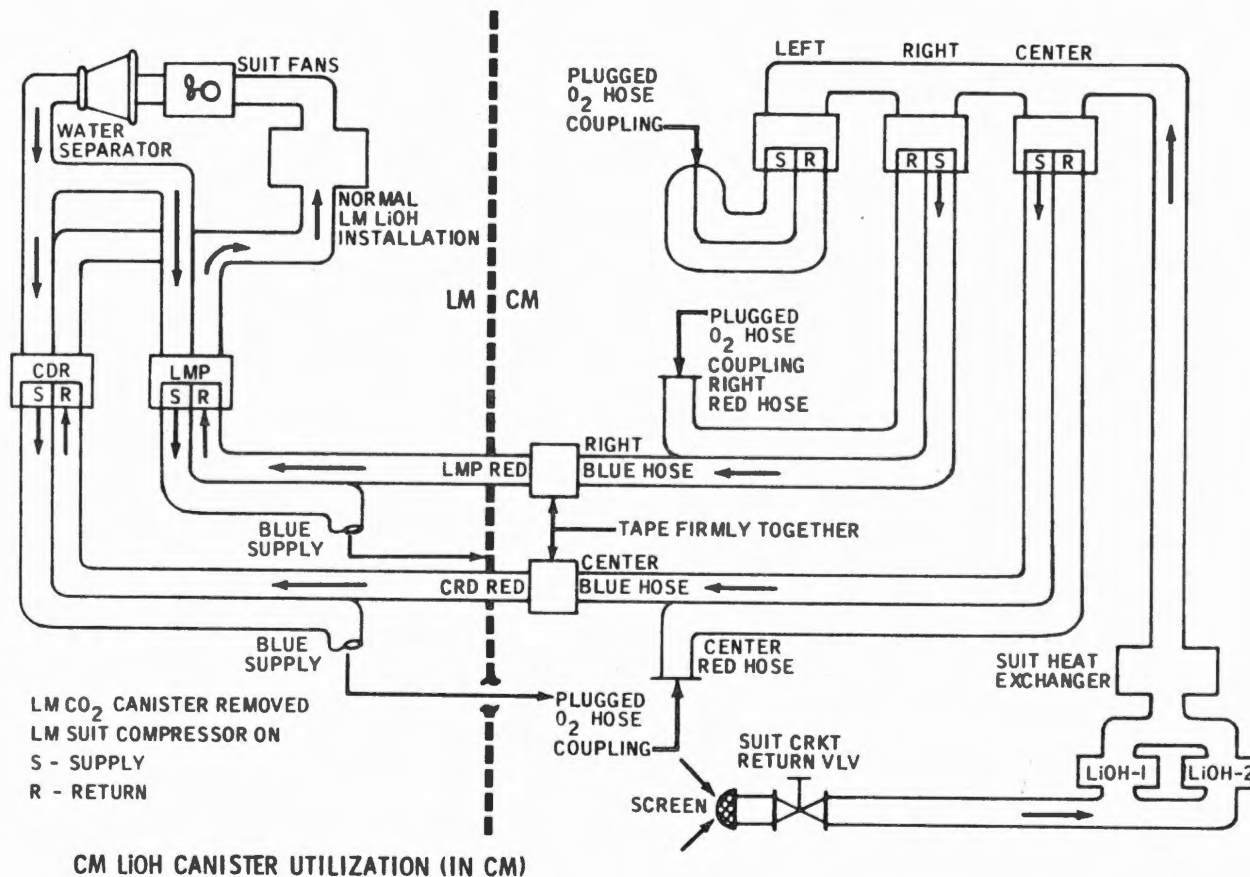
Unstow OPS O2 conn from O2 conn STOWAGE PLATE

Restrain Hose and DIRECT INTO OPEN VOLUME

CAUTION: Flow Rate ~250 lb/hr at 5880 psi

Cycle OPS ACTUATION LEVER as required

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2-27
C

DATE _____

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C
2-28

8 USE OF RE H2O BAG

H2O BAG FILL (POTABLE WATER)

DRINK WATER SUPPLY vlv - OFF
Disconnect Water Gun from Hose Assy & Stow
Connect Male QD on RE Flex
Trans Hose to Water Gun Hose
Connect H2O Bag Assy QD to other end of
RE Flex Trans Hose
DRINK WATER SUPPLY vlv - ON (5-8 min)
CAUTION: Do Not Overfill Bag (< taut)
When H2O Bag is full
DRINK WATER SUPPLY vlv - OFF
Disconnect H2O Bag & Flex Hose & stow
Connect Water Gun to Hose Assy
DRINK WATER SUPPLY vlv - ON

H2O BAG FILL (WASTE WATER)

Install Female QD on Waste Tank Service Port
Connect H2O Bag Assy QD to Female QD
CAUTION: If Waste H2O Qty < 10%
POTABLE TANK INLET - CLOSE
WASTE TK SERVICING vlv - OPEN (5-8 min)
CAUTION: Do Not Overfill Bag (< taut)
When H2O Bag is Full
WASTE TK SERVICING vlv - CLOSE
Disconnect H2O Bag and stow

H2O BAG DUMP

Configure for MNB POWER
cb ECS WASTE H2O/URINE DUMP HTR MNB-CLOSE
Remove H2O vlv from H2O Bag Hose Assy QD
Connect Urine Line Filter to Urine
Transfer Hose
Connect Urine Transfer Hose QD to
H2O Bag Hose Assy QD
Attach Urine Transfer Hose/Filter to
Waste Management QD
URINE DUMP - HTR B
OVBD DRAIN DUMP vlv - DUMP (~ 5-10 min)
When H2O Bag is empty
OVBD DRAIN DUMP vlv - OFF
Stow Empty H2O Bag in U1

DATE

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DATE

C
2-29

9 HARD SUIT TRANSFER TO LM
(Does not require dormant config)

LMP Transfer to LM w/CM hoses
Activate LM EPS & ECS as reqd.
Activate LM VHF SIMPLEX A
CMP Activate VHF SIMPLEX A
LMP Transfer to LM ECS
CMP (on cue) SUIT FLOW vlv (LMP, pn1 300) - OFF
LMP Disconnect CM hoses
Transfer OPS and CM hoses to CM
Establish LM Att reference & control mode
Transfer Attitude Control to LM
CDR Verify Surge Tk & Repress Pkg full & isolated
CMP Assist CDR in switching to LMP hoses
SUIT FLOW vlv (LMP, pn1 300) - SUIT FULL FLOW
SUIT FLOW vlv (CDR, pn1 301) - OFF
Disconnect CDR's hoses & install interconnect
CDR & CMP Reconfigure CSM
AUTO RCS SEL (16) - OFF
LM Power Transfer to CSM(C/2-35)(ASC Stage Only)
RHC PWR DIR (2) - OFF
Purge FC O2 & H2
SCS Power Down (EMER/1-7)
IMU & CMC to Standby (Descent Stage Attached)
HGA POWER - OFF
S BD ANT OMNI - OMNI B
S BD ANT - OMNI
SM RCS HTRS (4) - OFF
Dump Waste & Pot H2O Tks

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DATE

DATE

C
2-30

Transfer items per CSM/LM Transfer List (C/2-32)
CDR assist CMP to don OPS
Transfer to LM w/CM (LMP) hoses
LMP Connect LM hoses to CDR
CMP (on cue) SUIT FLOW vlv (LMP, Pn1 300) - OFF
LMP Disconnect CDR from CM hoses
Transfer CM hoses to CM
CMP Install Interconnect on LMP hoses
Tape LMP hoses in Tunnel area
Reconfigure Suit Loop
Activate OPS (do not purge)
Remove most used LiOH cann
SUIT CKT H2O ACCUM - OFF
cb C/W (2) - OPEN (Pn1 5)
VHF AM A - OFF
Activate PGA PURGE vlv at 4 lb/hr
SUIT COMPR 1 & 2 (2) - OFF
SUIT FLOW vlv (CMP, Pn1 302) - OFF
Disconnect CM hoses and install Interconnect
CMP Transfer to LM and close Hatch
PGA PURGE vlv - max flow
When LM cabin press = 3.0 psia
OPS O2 ACTUATION LEVER - OFF
Remove Helmet and Disconnect OPS
OPS O2 ACTUATION LEVER - ON (deplete)

DATE

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DATE

C
2-31

10 HARD SUIT TRANSFER TO CSM
(Does not require dormant config)

CMP Verify OPS prior to cabin depress
Transfer to CM w/OPS (purge 4 lb/hr)
Verify CM Suit Loop Press
Attach CMP hoses
SUIT FLOW vlv (CMP, Pn1 302) - SUIT FULL FLOW
SUIT COMPR 1 - AC 1
VHF AM A - SIMPLEX
Check PART PRESS CO2
PGA PURGE vlv - OFF (install pin)
Transfer CM LMP (Pn1 300) hoses to LM
SUIT CKT H2O ACCUM - AUTO 1
Install LiOH cann in empty compartment
OPS O2 ACTUATION LEVER - OFF
LMP Assist CDR in switching to CM LMP hoses
CMP (on cue) SUIT FLOW vlv (LMP, Pn1 300) - SUIT
FULL FLOW
CDR Transfer to CM
CMP Assist CDR in connecting to CM CDR hoses
SUIT FLOW vlv (CDR, Pn1 301) - SUIT FULL FLOW
SUIT FLOW vlv (LMP, Pn1 300) - OFF
Reconfigure CSM
cb C/W (2) - CLOSE (Pn1 5)
SM RCS HTRS (4) - ON
Perform CMC Powerup (G/2-2)
Perform IMU Powerup (G/2-1)
Transfer Alignment to CM (G/7-10)
Perform SCS Powerup (G/2-4)
Transfer items per LM/CSM Transfer List (C/2-32)
LMP Transfer to CM LMP hoses
CMP (On cue) SUIT FLOW vlv (LMP, Pn1 300) - SUIT
FULL FLOW
Verify quad temps > 55°F
CDR Transfer S/C Control to CSM
AUTO RCS SEL (16) - as req'd
LMP Complete LM closeout
Transfer to CM & close hatch
Establish CM Power as required

8/29/72

DATE

DATE

C
2-32

11 CSM/LM TRANSFER LIST

CM LiOH cann (2/day)
Meals (9/day)
Water Bags, filled (TBD/day)
Hygiene Equipment
 Towels
 Tissue Dispenser
 Urine Bags, empty
 Fecal Bags
 Medical Kit
Inflight Coverals w/Comm Carriers
Booties
Tape, Plastic Bags, etc
Pens, scissors, penlights, etc
FDF Documents

12 LM/CSM TRANSFER LIST

FDF Documents
Pens, scissors, penlights, etc
Tape, Plastic Bags, etc
Medical Kit
Water Bags, filled
Unused CM LiOH cann
Lunar surface return items
Cameras, magazines, etc

DATE

DATE 8/29/72

COMM

1A BASIC ACTIVATION (VOICE/RANGING)

CONFIGURE FOR AC & DC BUS POWER

cb FLT BUS MNA & MNB (2) - CLOSE (Pn1 225)

UP TLM CMD RESET - RESET then OFF

TELCOM GRP 1 & 2 (2) - AC1 or AC2

POWER PMP - NORM

PCM BIT RATE - HIGH

PWR - AUDIO/TONE

SUIT PWR - ON

Verify S/C Attitude and Select Best OMNI

S BD NORMAL PWR AMPL - as required

1B TM (FOLLOWS BASIC ACTIVATION)

S BD PWR AMPL - HIGH

S BD MODE PCM - PCM

PCM BIT RATE - LOW

PROVIDE ADDITIONAL TM

SCE PWR - NORM

cb ECS XDUCER PRESS GRP 1&2 MNA(B)(2)-CLOSE(Pn1 5)

cb ECS XDUCER TEMP MNA(B) - CLOSE (Pn1 5)

cb ECS SEC COOL LOOP XDUCER MNA(B) - CLOSE(Pn1 5)

cb ECS RAD CONT/HTRS MNA(B) - CLOSE (Pn1 5)

cb ECS WASTE/POT H2O MNA(B) - CLOSE (Pn1 5)

cb INSTR PWR CONT (4) - CLOSE (Pn1 276)

cb BAT C PWR ENTRY/PL - CLOSE (Pn1 250)

2 VOICE RECORD (NO XMTR)

CONFIGURE FOR AC & DC BUS POWER

cb FLT BUS MNA(B) - CLOSE (Pn1 225)

UP TLM CMD RESET - RESET then OFF

TELCOM GRP 1 - AC1 or AC2

POWER PMP - NORM

TAPE RECORDER RECORD - RECORD

TAPE RECORDER FWD - FWD

PWR - AUDIO/TONE

SUIT PWR - ON

To add PCM Record See "PROVIDE ADDITIONAL TM" Above

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COMM



EPS

EPS

1. INITIAL MAIN BUS TIES CLOSURE
cb BAT A & B PWR ENTRY/PL (2) - CLOSE (Pn1 250)
cb MAIN A BAT BUS A - CLOSE (Pn1 275)
cb MAIN B BAT BUS B - CLOSE (Pn1 275)
Verify BAT BUS A & B VOLTS 31.5 - 38.0
MAIN BUS TIE BAT A/C - BAT A/C
Check BAT BUS A AMPS and MNA VOLTS
MAIN BUS TIE BAT B/C - BAT B/C
Check BAT BUS B AMPS and MNB VOLTS
TO OPEN BUS TIES:
 cb MAIN A BAT BUS A - OPEN (Pn1 275)
 cb MAIN B BAT BUS B - OPEN (Pn1 275)
 cb BAT A & B PWR ENTRY/PL (2) - OPEN (Pn1 250)

2. LM PWR TRANSFER TO CSM
After LM Configured for PWR TRANSFER
Do NOT Connect LM to CSM if CSM load >25 AMPS
If load >25 AMPS or Unable to keep LM PWR
 Transfer loads to MNA
LM PWR - CSM

3. BATTERY A(B) CHARGING
cb BAT A(B) PWR ENTRY/PL - CLOSE (Pn1 250)
cb INVERTER PWR 2 MAIN B - CLOSE (Pn1 275)
MAIN BUS TIE BAT A/C(B/C) - OFF A/C(B/C)
BAT CHGR - AC2
AC INVERTER 2 - MNB
AC INVERTER 2 AC BUS 2 - on (up)
AC BUS 2 RESET - RESET - ON OFF
BATTERY CHARGE sel - A(B) OFF
DC INDICATOR sel - BAT CHARGER FC2
To Terminate Procedure, Reverse Procedure

4. BATTERY C CHARGING
Replace First Line of BAT A CHARGING with:
 cb BAT C PWR ENTRY/PL - CLOSE (Pn1 250)
 cb BAT C TO BAT BUS A - CLOSE (Pn1 250)
Charge through BAT A Procedure

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EPS

5. USE OF AUX BATTERY
cb BAT B PWR ENTRY/PL - CLOSE (Pn1 250)
SM PWR SOURCE - AUX BAT (mom) (Pn1 278)
FUEL CELL 2 - desired main bus
Verify MAIN BUS VOLTS >26.5
Monitor FC 2 AMPS
6. AC POWER
cb BAT A PWR ENTRY/PL - CLOSE (Pn1 250)
cb INVERTER PWR 2 MAIN B - CLOSE (Pn1 275)
AC INVERTER 2 - MN B
AC INVERTER 2 AC BUS 1 & 2 (2) - on (up)
AC BUS 1&2 RESET (2) - RESET - ON OFF
Verify AC VOLTS >110

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G&C

1 DISPLAY RATE (SCS) (FDAI SCALE = 5/1 w/o LOGIC BUS)
Configure for AC2 & MNB BUS POWER
BMAG POWER 2 - ON OFF
FDAI/GPI POWER - 2 OFF

2 DISPLAY ATTITUDE (SCS)
Configure for AC1 & 2 and MNB BUS POWER
BMAG POWER 2 - ON OFF
cb SCS LOGIC BUS MNB 2/3 - CLOSE (Pnl 8)
cb SCS LOGIC BUS MNB 1/4 - CLOSE (Pnl 8)
FDAI SELECT - 2 1/2
FDAI/GPI POWER - 2 OFF
SCS ELECTRONICS PWR - GDC/ECA OFF

3 DISPLAY ATTITUDE (G&N)
Configure for AC2 & MNB BUS POWER
cb SCS LOGIC BUS MNB 2/3 - CLOSE (Pnl 8)
cb SCS LOGIC BUS MNB 1/4 - CLOSE (Pnl 8)
FDAI/GPI POWER - 2 OFF
FDAI SELECT - 2 1/2
FDAI SOURCE - CMC GDC

4 CMC MIN IMPULSE
Configure for one MN BUS and active DAP
cb G/N COMPUTER (2) - CLOSE (Pnl 5)
PRO, push (~5 sec), if req'd
F37 00E
SC CONT - CMC/FREE
ROT CONTR PWR NORMAL 2 - AC/DC
AUTO RCS SELECT - single jet
When min impulse not req'd
AUTO RCS SELECT (16) - OFF
ROT CONTR PWR NORMAL 2 - OFF
V37E 06E
PRO, push (~ 5 sec) until DSKY blanks
cb G/N COMPUTER (2) - OPEN (Pnl 5)

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- 5 SCS MIN IMPULSE
Configure for AC1 & MNB BUS POWER
AC INV 2 - MNB (verify)
cb SCS LOGIC BUS MNB 1/4 - CLOSE
cb SCS LOGIC BUS MNB 2/3 - CLOSE
SCS ELECTRONICS PWR - ECA OFF
ROT CONTR PWR NORMAL 2 - AC/DC OFF
AUTO RCS SELECT - single jet
- 6 OPTICS POWER
Configure for MN BUS POWER
G&N POWER OPTICS - on (up)
If Reticle Required
G/N PWR - AC1 or AC2 OFF

G&C

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CSM POWER CRITICAL ENTRY

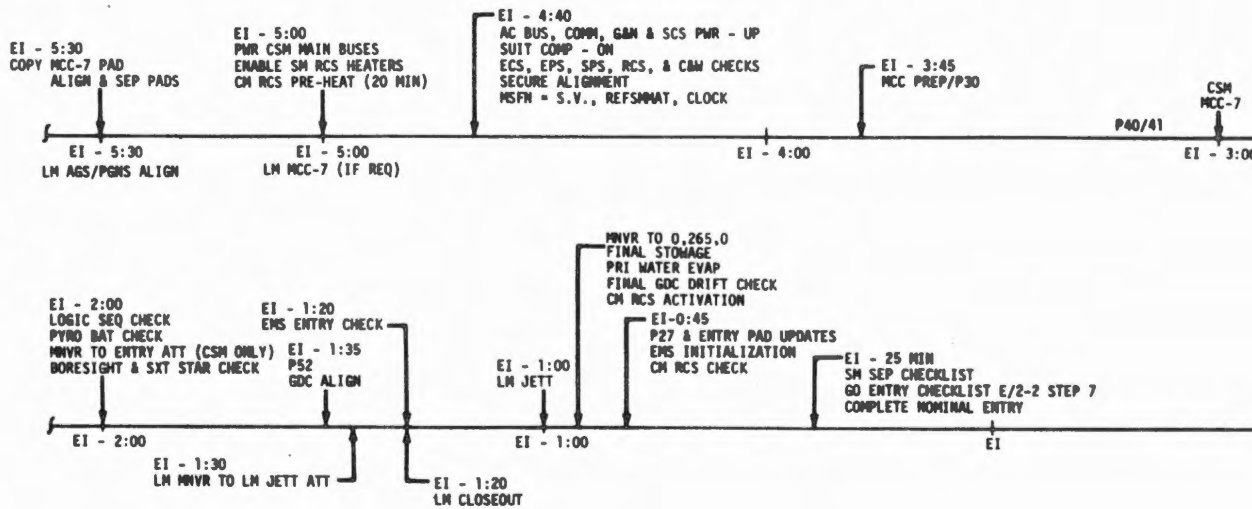
CSM POWER CRITICAL ENTRY

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BASIC ENTRY (PWR CRITICAL)

CSM/LM ATTACHED

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CSM/LM ATTACHED

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C
3-3

CSM POWER CRITICAL ENTRY-LM ATTACHED or CSM ONLY

Assumes DORMANT CONFIGURATION, pg C/2-1

1 Verify Stowage Transfer complete

2	EI-5:30hr	LM MIDCOURSE MANEUVER, if req'd LM copy MCC-7, ALIGN & SEP PADS LM AGS/PGNS ALIGN
	EI-5:00hr	LM MCC-7

3 EI-4:55hr POWER CSM MAIN BUSES
 (250) cb BAT A,B,&C PWR ENTRY/PL(3) - close
 FC 2 MNA - on (up)
 FC 2 MNB - on (up)
 MNA & MNB RSET - RSET, on
 Verify Main Buses > 26.5 vdc
 (5) cb C/W (2) - close
 cb IMU HTR MNB - close
 (276) cb INST PWR CONT (4) - close

4 (8) ENABLE SM RCS HEATERS
 cb SM RCS HTRS (4) - close
 SM RCS HTRS (4) - PRIM

5 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
 CM RCS LOGIC - on (up)
 (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)

6 TERM. CM RCS PREHEAT
 CM RCS HTRS - OFF (LMP Confirm)
 CM RCS LOGIC - OFF
 cb CM RCS HTR (2) - open

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C
3-4

- 7 EI-4:40hr AC BUS PWR UP
(275) cb INVERTER POWER (4) - close
INV 2 - MNB
INV 2 AC1 & AC2 - on (up)
AC1 & AC2 RSET - RSET, on

- 8 (225) COMM PWR UP
cb FLT BUS (2) - close
TELCOM GRP 1 - AC1
TELCOM GRP 2 - AC2
S-BD MODE PCM - PCM
SCE PWR - NORM
PMP PWR - NORM
Configure Pnl 6, 9, 10 for voice

- 9 G/N POWER UP
INTERIOR Lts (NUMERICS) - INCR
cb G/N COMPUTER (2) - close
PRO, push (~ 5 sec), if req'd
F37 00E
Verify OMNI
UP TLM - CMD RSET, then NORM
UP TLM CM - ACCEPT (V74, State Vector
(V66), Clock Increment,
REFSMMAT(S), Entry TGT)

- (229) cb TIMERS (2) - close
- (225) cb CTE (2) - close
MISSION TIMER - RSET
Set MISSION TIMER

- G/N PWR IMU - on (up) (wait 90 sec)
Perform DOCKED IMU ALIGN
CM(OGA)r = 300° - LM OGA + Δθ
CM(IGA)p = LM IGA ± 180°
CM(MGA)y = 360° - LM MGA

- V41 N20E, OG____, IG____, MG____

- V40E (free platform)
Set REFSMFLG:
V25 N7E, 77E, 10000E, 1E
Set DRIFTFLG:
V37E 51E, PRO, V37E 00E

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3-5

(8) cb SCS LOGIC BUS (4) - close
FDAI/GPI PWR - 1
FDAI SOURCE - CMC

G/N PWR - AC2
G/N PWR OPTICS - on (up)
OPT ZERO - OFF
OPT ZERO - ZERO (15 sec)
OPT ZERO - OFF
If CSM only, perform P51
Perform P52 (option 1)
STDN supply optics angles for stars

G/N PWR OPTICS - OFF
G/N PWR (AC) - OFF

10

SCS POWER UP
SCS ELEC PWR - GDC/ECA
SIG CONDR/DRIVER BIAS PWR - AC1
FDAI/GPI PWR - OFF
BMAG PWR (both) - ON
(wait 90 sec)
FDAI/GPI PWR - BOTH
GDC ALIGN

11

SUIT COMPRESSOR 1 - AC1

12

ECS CKS
cb ECS TRANSDUCERS (8) - close
O2 SUPPLY REFILL pg S/1-7
PGA verification, (if suited)S/1-14

13

EPS CKS #1, 3, 4 (5 if req'd) pg S/1-2

14

SPS CK (If req'd) pg S/1-1

15

RCS CKS
SM RCS Monit Ck pg S/1-1
CM RCS Monit Ck pg S/1-1

16

C&W SYS CK pg S/1-20

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- 17 -03:45h CSM MIDCOURSE MANEUVER, if req'd
P30 - EXT ΔV
-03:15h P40/41 - SPS/RCS THRUSTING
(If P40 req'd, go to pg C/1-17)
-03:00h CSM MCC-7
- 18 Select best OMNI
- 19 PRIMARY WATER EVAP ACTIVATION
H2O/GLY TK PRESS REG vlv - BOTH
PRI ECS GLY PUMP - AC1
SUIT CKRT H2O ACCUM - AUTO 1
GLY EVAP H2O FLOW - AUTO
GLY EVAP STM PRESS - AUTO
- 20 -02:00h LOGIC SEQUENCE CK
cb SECS ARM (2) - close
cb ELS/CM-SM SEP (2) - close
ELS LOGIC - on (up)
ELS - AUTO
Coordinate next 3 steps with STDN
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/CM-SM SEP (2) - open
- 21 (250) PYRO BATT CK
cb PYRO A SEQ A - close (verify)
cb PYRO B SEQ B - close (verify)
DC IND - PYRO BAT A(B)
*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
* BUS TIE - close *

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22 -01:35h P52 - IMU REALIGN pg G/6-2 (OPTION 3)
Record gyro torquing angles

R _____
P _____
Y _____

*IF > 1° - recycle P52 *

If confirmed, use SCS for EMS entry

G/N PWR OPTICS - OFF

G/N PWR (AC) - OFF

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

24 -01:30h LM MNVR TO JETTISON ATTITUDE
MONITOR TO AVOID GIMBAL LOCK
LM ATT HOLD, MAX DB

25 LM CLOSE OUT
Close LM HATCH and DUMP vlv
Perform HATCH DECAL
Perform HATCH INTEGRITY CHECK
SURGE TK - ON
MAIN REG v1vs (2) - OPEN
EMER CABIN PRESS vlv - BOTH
LM PWR - OFF

26 -01:20h 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 nm +0.0

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EMS FUNC - EMS TEST 4
.05G 1t - on (all others out)
G-V trace within pattern to lwr rt
corner at 9G
RANGE ind counts down to $0+0.2$
EMS FUNC - EMS TEST 5
.05G 1t - on
RSI upper 1t - on (10 sec later)
RANGE ind - 0.0
Scribe traces vertical line 9g to
 $0.28+0.1$
ALIGN SCROLL TO ENTRY PATTERN (on
37K ft/sec line)
EMS FUNC - RNG SET
G-V scroll assy traces vert. line
 $0.28g$ to $0+0.1$
EMS MODE - STBY

27 -01:00h

LM JETTISON
AUTO RCS SELECT (12) - MNA or MNB
ROT CONTR PWR NORMAL 2 - AC/DC
ROT CONTR PWR DIRECT 2 - MNA/MNB
cb SECS ARM (2) - close
Cue MSFN
SECS LOGIC (2) - on (up)
V37E 47E
SC CONT - CMC/FREE
MSFN confirm GO for PYRO ARM
SECS PYRO ARM (2) - ARM
CSM/LM FINAL SEP (2) - on (up)
SECS PYRO ARM (2) - SAFE
SECS LOGIC (2) - OFF
Load DAP 11102
SC CONT - CMC/AUTO
PRO OOE

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28 MNVR TO 0°, 267°, 0°
V49E

Select best OMNI

29 BORESIGHT & SXT STAR CHECK

G/N PWR - AC2

G/N PWR OPTICS - on (up)

OPT ZERO - OFF

OPT ZERO - ZERO (15 sec)

OPT ZERO - OFF

OPT MODE - CMC

Check SXT STAR (V41 N91E)

Drive Optics to 90° shaft angle

G/N PWR OPTICS - OFF

30 FINAL STOWAGE

OPTICS

Install Optics Covers

ORDEAL

(377) GLY TO RAD SEC vlv - BYPASS (verify)

Verify EVA COUCH STRUT disengaged

(382) Cool pnl installed

Y-Y struts (2) extended

Stow Data Box R-12

Attach Both strut unlock lanyards

Check for water in tunnel area

Stow gas separator (A8)

Stow C1 injector (R6)

WASTE MGMT DRAIN vlv - OFF (verify)

Remove & stow URA, urine transfer

hose and urine filter

Verify COAS locked in stowage mount

31 (226) cb FC 1 BUS CONT - close

SYS TEST METER - 5B (BAT RLY BUS

3.4-4.1 vdc)

32 (: :) FINAL GDC DRIFT CK (if req'd)

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

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C
3-10

33

CM RCS ACTIVATION

cb SECS ARM (2) - cclose (verify)
Cue MSFN
SECS LOGIC (2) - on (up)
MSFN confirm GO for PYRO ARM
SECS PYRO ARM (2) - ARM
CM RCS PRPLNT 1&2 tb(2) - gray(verify)
CM RCS PRESS - on (up)
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

34 -45:00m

P27 & ENTRY PAD UPDATE, pg E/1-7

35

Set DET (up, to EI)

36

EMS INITIALIZATION

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

EMS FUNC - RNG SET (verify)
SET RNG TO PAD DATA RNG
EMS FUNC - Vo SET
Slew Scroll to Pad Data VIO
EMS MODE - STBY (verify)
EMS FUNC - ENTRY

DATE

37

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

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CM RCS CHECK

AUTO RCS A/C ROLL (4) - OFF (verify)
cb RCS LOGIC (2) - close (verify)
SC CONT - SCS
MAN ATT (3) - MIN IMP
RCS TRNFR - CM
AUTO RCS SEL (RING 1) - OFF
AUTO RCS SEL (RING 2) - MNB
TEST RING 2 THRUSTERS
AUTO RCS SEL (RING 1) - MNA
AUTO RCS SEL (RING 2) - OFF
TEST RING 1 THRUSTERS
AUTO RCS SEL (RING 2) - MNB
RCS TRNFR - SM
MAN ATT (3) - RATE CMD
SC CONT - CMC/AUTO

39 30:00m
(-30:00)

cb MNA BAT BUS A - close
cb MNA BAT C - close
cb MNB BAT C - close
cb MNB BAT BUS B - close
TAPE RCDR - REWIND

40 35:00m
(-25:00)

SEPARATION CK LIST

cb SECS ARM (2) - close (verify)
cb ELS/CM-SM SEP (2) - close
PRIM GLY TO RAD - BYPASS (pull)
REPRESS PKG vlv - FILL to 865-935,
then ON
02 SM SUPPLY vlv - OFF
SURGE TK - ON (verify)
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 (verify)
Verify Loads Balanced
(5) cb ECS RAD CONT/HTR (2) - open

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C
3-12

POWER UP 2nd INVERTER

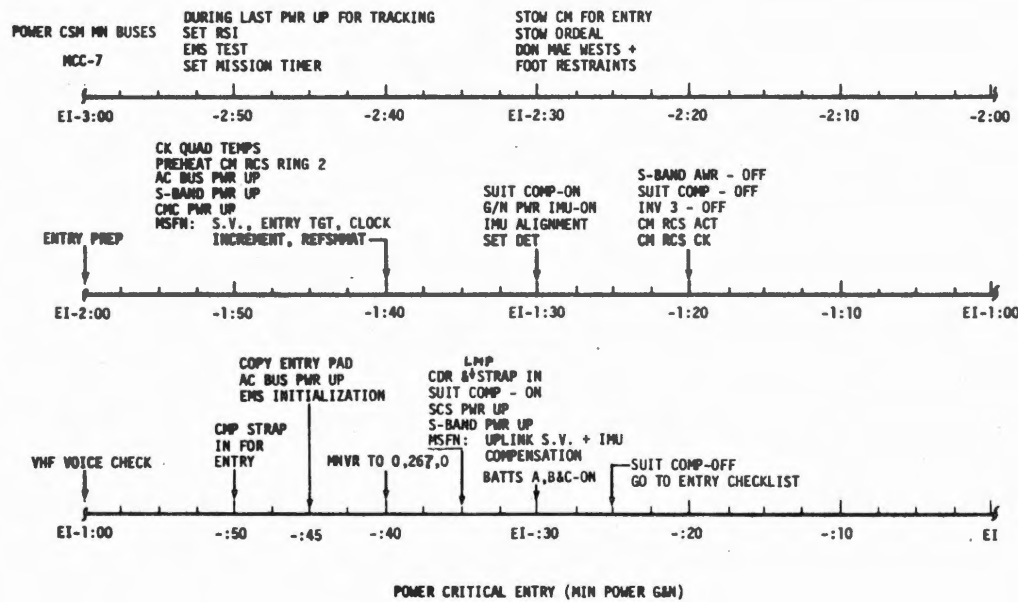
INV 1 - MNA
INV 2 AC1 - OFF
INV 1 AC1 - on (up)
AC1 RSET - RSET, on

Go to ENTRY CHECKLIST, Pg E/2-2, Step 7

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C

MIN PWR G&N

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MIN PWR G&N

C
3-15

POWER CRITICAL ENTRY-CSM ONLY-MIN PWR G&N

EI -3:00 hr MCC-7

Set RSI and do EMS test during pwr up
for last tracking and MCC

POWER CSM MAIN BUSES

FC 2 MNA & MNB - on (up)
MNA & MNB RSET - RSET, on
Verify Main Buses > 26.5 vdc
Verify PYRO BATS > 35 vdc

- (5) cb C/W (2) - close
cb IMU HTR (2) - close
Set MISSION TIMER

Make the following changes in the
ENTRY CHECKLIST:

Pg E/2-2, step 6
delete: FC PUMPS (3) - OFF
FC 2 MNA - OFF
add: S-BD PWR AMP - OFF

STOW CM FOR ENTRY

STOW ORDEAL

DON MAE WESTS & FOOT RESTRAINTS

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EI -2:00 hr ENTRY PREP
LIMIT CYCLE - OFF
RATE - HIGH
ROT CONTR PWR NORMAL (2) - AC/DC
SC CONT - CMC/FREE
BMAG MODE (3) - RATE 1
ATT SET dials - Set MSFN GDC angles
(EI-10 min ALIGNMENT, if req'd)
(8) cb SCS LOGIC BUS (4) - close
cb SM RCS HTRS (4) - close
AUTO RCS SEL (RING 1) - MNA
AUTO RCS SEL (RING 2) - MNB
MAN ATT (3) - ACCEL CMD
cb SCS B/D ROLL, P&Y MNB (3) - open
(5) cb ECS PRESS GRPS 1&2 MNA(2)-close
(276) cb INST PWR CONTR (4) - close
(275) cb FLIGHT/PL BAT BUS A&B(2)-close
(229) cb TIMERS MNA - close
(225) cb FLT BUS (2) - close
(225) cb CTE (2) - close
(250) cb BAT A,B&C PWR ENTRY/PL (3)-close
After Tunnel is closed:
(351) MAIN O2 REG vlvs (2) - OPEN
Configure Audio Pnl's

EI -1:40 hr Check Quad Temps
If any Quad < 60°
RCS HTR - on until > 60°
PREHEAT CM RCS RING 2
(concurrent with IMU align)
Check CM RCS Temps > 3.9 vdc on sys
test mtr
RING 2 - 5c, d, 6d
RING 1 - 6a, b, c
If heat req'd:
(8) cb CM RCS HTR MNB - close
CM RCS LOGIC - on (up)
CM RCS HTRS - on (up) (LMP Confirm)
When lowest temp is > 3.9 vdc or at
20 min, whichever comes first:
CM RCS HTRS - OFF (LMP Confirm)
CM RCS LOGIC - OFF
cb CM RCS HTR MNB - open

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(275) AC BUS PWR UP
cb INV PWR (4) - close
INV 3 - MNA
INV 3 AC1 & AC2 - on (up)
AC1 & AC2 RSET - RSET, on
PWR PMP - NORM
TELCOM GRP 1&2 - AC1

(5) G/N PWR UP
cb G/N COMPUTER (2) - close
PRO, push (~ 5 sec), if req'd
F37 OOE
Verify DAP set for B/D roll
UP TLM - CMD RSET, then NORM
UP TLM CM - ACCEPT
(V74, State Vector (V66), Clock
Increment, REFSMMAT, Entry TGT)

EI -1:30 hr SUIT COMPRESSOR 1 - AC1 (10 min)
G/N PWR IMU - on (up)
NO ATT 1t - on (90 sec)
NO ATT 1t - out
G/N PWR OPTICS - on (up)

IMU ALIGNMENT
G/N PWR - AC2
OPT ZERO - OFF
OPT ZERO - ZERO (15 sec)
OPT ZERO - OFF

Perform P51
Perform P52 (option 1)

Set DET (counting up to EI)
Verify Mission Timer
Drive Optics to 90° shaft angle
G/N PWR OPTICS - OFF
G/N PWR (AC) - OFF
TELCOM GRP 1&2 - OFF

EI -1:20hr SUIT COMPRESSOR 1 - OFF
INV 3 AC1 & AC2 - OFF
INV 3 - OFF

V16 N20E (monitor R3 to avoid GMBL LOCK)

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C
3-18

- (8) CM RCS ACTIVATION
cb SECS ARM (2) - close
SECS LOGIC (2) - on(up)
SECS PYRO ARM (2) - ARM
CM RCS PRPLNT 1&2 tb (2) - gray (verify)
CM RCS PRESS - on (up)
RCS IND sw - CMI, then 2
He PRESS stabilizes at 3300-3500
psia after 15 minutes
MANF PRESS 287-302 psia
SECS PYRO ARM (2) - SAFE

CM RCS CHECK (within 5 min of press.)
(firing jets heats ring 1)

RCS TRNFR - CM
TEST RING 1 THRUSTERS (1 sec each)
cb SCS B/D ROLL, P&Y MNB (3) - close
cb SCS B/D ROLL, P&Y MNA (3) - open
TEST RING 2 THRUSTERS (1 sec each)
RCS TRNFR - SM
cb SCS B/D ROLL, P&Y MNA-(3) - close
Damp S/C rates with SM RCS
MAN ATT (3) - MIN IMP

EI -1:00 hr VHF AM A - SIMPLEX
Contact STDN

EI -50 min CMP strap in for Entry

EI -45 min COPY ENTRY PAD

AC BUS PWR UP
INV 3 - MNA
INV 3 AC1 & AC2 - on (up)
AC1 & AC2 RSET - RSET, on

EMS INITIALIZATION
EMS MODE - STBY
EMS FUNC - TEST 5
slew scroll to 37K
EMS FUNC - RNG SET
set PAD RNG
EMS FUNC - Vo SET
slew scroll to PAD VIO
EMS FUNC - ENTRY

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C
3-19

EI -40 min MNVR TO 0°, 267°, 0°
SC CONT - CMC/AUTO
V49E
(8) AUTO RCS SEL A/C ROLL (4) - OFF
cb SPS P&Y (4) - open
At completion of V49 mnvr:
CMC MODE - FREE

EI -35 min CDR & LMP strap in for Entry
SUIT COMPRESSOR 1 - AC1 (10 min)

SCS PWR UP
SCS ELEC PWR - GDC/ECA
BMAG PWR 1 - ON
FDAI/GPI PWR - BOTH

TELCOM GRP 1&2 - AC1
S-BD OMNI ANT - C
VHF AM A - OFF
UP TLM CM - ACCEPT
(IMU compensation & State Vector)
GDC ALIGN to IMU
UP TLM CM - BLOCK

EI -30 min
(275) cb MNA BAT BUS A - close
cb MNA BAT C - close
cb MNB BAT C - close
cb MNB BAT BUS B - close

EI -25 min SUIT COMPRESSOR 1 - OFF
BMAG PWR 2 - ON

Go to ENTRY CHECKLIST, pg E/2-2, step 6

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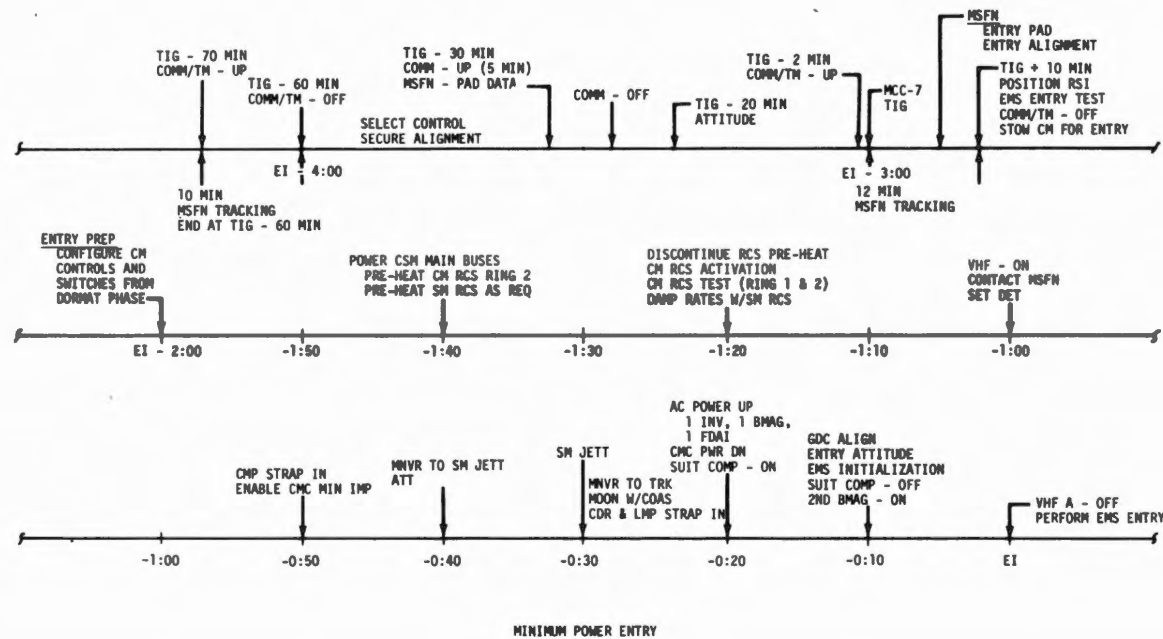
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3-20

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3-21
C

MIN PWR SCS

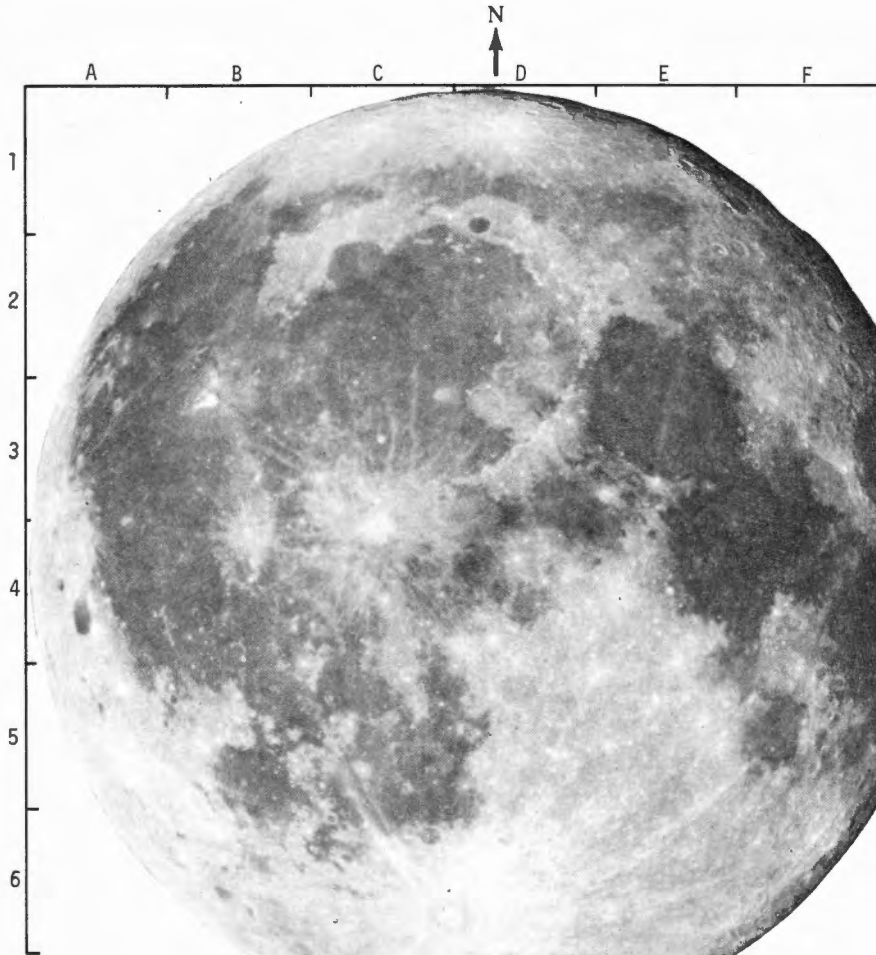
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C
3-22

MIN PWR SCS



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MOON/COAS ILLUSTRATION

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C
3-23

POWER CRITICAL ENTRY - CSM ONLY - MIN PWR SCS

EI -3:00 hr MCC-7

Set RSI and do EMS test during pwr up for last tracking and MCC and set Mission Timer, if pwr available.

STOW CM FOR ENTRY

STOW ORDEAL

DON MAE WESTS & FOOT RESTRAINTS

EI -2:00 hr ENTRY PREP

FDAI SELECT - 1

LIMIT CYCLE - OFF

RATE - HIGH

ROT CONTR PWR NORMAL (2) - AC/DC

SC CONT - CMC/FREE

BMAG MODE (3) - RATE 1

ATT SET dials - Set STDN GDC angles
(EI-10 min ALIGNMENT)

(8) cb SCS LOGIC BUS (4) - close

cb SM RCS HTRS (4) - close

AUTO RCS SEL (RING 1) - MNA

AUTO RCS SEL (RING 2) - MNB

MAN ATT (3) - ACCEL CMD

cb SCS B/D ROLL, P&Y MNB (3) - open

(5) cb ECS PRESS GRPS 1&2 MNA(2)-close

(276) cb INST PWR CONTR (4) - close

(275) cb FLIGHT/PL BAT BUS A&B(2)-close

(229) cb TIMERS MNA - close

(225) cb CTE (2) - close

(250) cb BAT A,B&C PWR ENTRY/PL (3)-close

After Tunnel is closed:

(351) MAIN O2 REG vlvs (2) - OPEN

Configure Audio Pnl

EI -1:40 hr POWER CSM MAIN BUSES

FC 2 MNA & MNB - on (up)

MNA & MNB RSET - RSET, on

Verify Main Buses > 26.5 vdc

Verify PYRO BATS > 35 vdc

(5) cb C/W (2) - close

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3-24

Check Quad Temps

If any Quad < 60°

RCS HTR - on until > 60°

PREHEAT CM RCS RING 2

Check CM RCS Temps > 3.9 vdc on sys test mtr

RING 2 - 5c, d, 6d

RING 1 - 6a, b, c

If heat req'd:

(8) cb CM RCS HTR MNB (1) - close

CM RCS LOGIC - on (up)

CM RCS HTRS - on (up) (LMP Confirm)

When lowest temp is > 3.9 vdc or at 20 min, whichever comes first:

CM RCS HTRS - OFF (LMP Confirm)

CM RCS LOGIC - OFF

cb CM RCS HTR MNB - open

EI -1:20 hr CM RCS ACTIVATION

(8) cb SECS ARM (2) - close

SECS LOGIC (2) - on(up)

SECS PYRO ARM (2) - ARM

CM RCS PRPLNT 1&2 tb (2) - gray (verify)

CM RCS PRESS - ON

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

CM RCS CHECK (within 5 min of press.)

(firing jets heats ring 1)

RCS TRNFR - CM

TEST RING 1 THRUSTERS (1 sec each)

cb SCS B/D ROLL, P&Y MNB (3) - close

cb SCS B/D ROLL, P&Y MNA (3) - open

TEST RING 2 THRUSTERS (1 sec each)

RCS TRNFR - SM

cb SCS B/D ROLL, P&Y MNA (3) - close

Damp S/C rates with SM RCS

MAN ATT (3) - MIN IMP

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C
3-25

EI -1:00 hr VHF AM A - SIMPLEX
Contact STDN
Set DET (counting up to EI)

EI -50 min CMP strap in for Entry

ENABLE CMC MIN IMPULSE
cb G/N COMPUTER (2) - close
PRO, push (~5 sec), if req'd
F37 OOE
Verify DAP loaded for B/D roll

EI -40 min MNVR TO SM JETT ATTITUDE
(+X at center of earth)
SURGE TK - ON
PRIM GLY TO RAD - BYPASS (pull)
SM O2 SUPPLY vlv - OFF
AUTO RCS SEL A/C ROLL (4) - OFF
SM RCS PRIM PRPLNT (4) - OPEN
SM RCS SEC PRPLNT FUEL PRESS (4) - OPEN
CM RCS LOGIC - on (up)
RCS IND sw - CM2
(275) cb MNA BAT BUS A - close
cb MNA BAT C - close
cb MNB BAT C - close
cb MNB BAT BUS B - close
Check BAT BUS current
(8) cb SPS P&Y (4) - open
cb ELS/CM-SM SEP (2) - close
SECS PYRO ARM (2) - ARM
Verify attitude & control
VHF AM A - OFF

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EI -30 min SM JETT
CM/SM SEP (2) - on (up)
CSM/LM FNL SEP (2) - on (up)
RCS TRNFR - CM
Damp SC rates
C/W MODE - CM
SECS PYRO ARM (2) - SAFE
CM RCS LOGIC - OFF
CM RCS MANF PRESS - 287-302 psia
Verify attitude control (RING 2/MNB)

C
3-26

MNVR TO TRACK MOON WITH COAS, Pg C/3-22

CDR & LMP strap in for Entry

EI -20 min AC BUS PWR UP
(275) cb INV PWR 3 MNA & MNB (2) - close
INV 3 - MNA
INV 3 AC1 & AC2 - on (up)
AC1 & AC2 RSET - RSET, on

SUIT COMPRESSOR 1 - AC1

SCS PWR UP
SCS ELEC PWR - GDC/ECA
BMAG PWR 1 - ON
FDAI/GPI PWR - 1
SC CONT - SCS

CMC PWR DOWN
V37E 06E
PRO, push (~5 sec) until STBY Lt - on
(5) cb G/N COMPUTER (2) - open

EMS INITIALIZATION
EMS MODE - STBY
EMS FUNC - TEST 5
slew scroll to 37K
EMS FUNC - RNG SET
set PAD RNG
EMS FUNC - Vo SET
slew scroll to PAD VIO
EMS FUNC - ENTRY

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EI -10 min GDC ALIGN (to STDN angles set at -2:00 hr)

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C
3-27

TRACK MOON, HORIZON OR ENTRY ATTITUDE
(moon set ~ EI -2 min)

SUIT COMPRESSOR - OFF
FDAI SCALE - 5/5
BMAG PWR 2 - ON
ROT CONTR PWR DIRECT (2) - MNA/MNB
Verify attitude
BMAG MODE (3) - RATE 2
MAN ATT (3) - RATE CMD
Stow COAS & lock in mount
EMS MODE - NORMAL
Verify .05G lt filter is down

PERFORM EMS ENTRY

Go to EARTH/POST LANDING,
pg E/3-1

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Post Before Page C/4-1

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B&H

GENERAL CONTINGENCY PROCEDURES

GENERAL CONTINGENCY PROCEDURES

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C
4-1

LOI 30 MIN DPS ABORT

ΔV THRUST A/B - OFF
SPS INJ vlvs (4) - CLOSED
SPS He tb (2) - bp
GMBL MOTS(4) - OFF (LMP Verify)
TVC SERVO PWR (2) - OFF
MN BUS TIE (2) - OFF
SC CONT - SCS
PCM BIT RATE - LOW
EMS MODE - STBY (verify)

RECORD DATA AND COMPUTE PAD

F 97 40

Record TFC _____
VG _____
ΔVM _____
EMS ΔVC _____

ENTR

F 99 40

ENTR

F 16 85

Record VGX _____
VGY _____
VGZ _____

R _____
P _____
Y _____

PRO

F 37 00E

When CMC ACTY 1t out:
V66E

ALTERNATE
ΔVC LOI PAD _____
EMS ΔVC(Shutdown) _____
ΔVC(Burned) _____
ΔVC ABORT(Chart) _____

PRIMARY

G&N ΔVM _____
ΔVC ABORT(Chart) _____

GET LOI _____
+30:00
GET TEI ABORT : :

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LOI ABORTS

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C
4-2

LOI ABORTS

- 1 MNVR TO PAD BURN ATTITUDE
V62E
- 2 F 06 22 V49E
NEW ICDU ANGLES RPY (.01°)
Load desired angles
PRO
- 3 F 50 18 REQ MNVR TO FDAI RPY ANGLES (.01°)
(AUTO) BMAG MODE (3) - RATE 2
SC CONT - CMC
CMC MODE - AUTO
PRO
(MAN) MNVR - To 5
- 4 06 18 AUTO MNVR TO FDAI RPY ANGLES (.01°)
- 5 F 50 18 REQ TRIM MNVR TO FDAI RPY ANGLES
(TRIM) PRO To 4
(BYPASS) ENTR
EMS FUNC - OFF
Set ΔVC = +100.0
EMS FUNC - ΔV
TVC SERVO PWR 1 - AC1/MNA
- 28:00
(-02:00) V37E 47E
F 16 83 ΔV XYZ(CSM) (.1fps)
- 29:30
(-00:30) EMS MODE - NORMAL
- 29:58
(-00:02) CMC MODE - FREE
or SC CONT - SCS
MAN ATT (3) - ACCEL CMD
- 30:00
(00:00) DPS IGNITION
After engine cutoff (on LM callout)
CMC MODE - AUTO

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C
4-3

RECORD ΔV COUNTER & RESIDUALS

ΔVC	_____	R	_____
		P	_____
		Y	_____

F 37 00E

When CMC ACTY 1t out, V66E
 EMS FUNC - OFF
 EMS MODE - STBY
 TVC SERVO PWR 1 - OFF

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C
4-4

2 LOI 2 HR DOCKED DPS/APS ABORT

- ΔV THRUST A/B - OFF
- SPS INJ vlvs (4) - CLOSED
- SPS He tb (2) - bp
- GMBL MTRS (4) - OFF (LMP verify)
- TVC SERVO PWR (2) - OFF
- MN BUS TIE(2) - OFF
- SC CONT - SCS
- PCM BIT RATE - LOW
- EMS MODE - STBY

RECORD DATA AND COMPUTE PAD

F 97 40

Record TFC _____
 VG _____
 ΔVM _____
 EMS ΔVC _____

ENTR

F 99 40

ENTR

F 16 85

Record VGX _____ R _____
 VGY _____ P _____
 VGZ _____ Y _____

PRO

F 37 00E

When CMC ACTY 1t out, V66E
 Perform P52 Star Check. If star not in SXT,
 perform P52, OPT 3
 MODE I - Mnvr to Chart Burn Attitude
 MODE II - Mnvr to Flight Plan AOS Attitude

ASSIST CDR & LMP IVT & LM ACT.

Couches: CDR - 0°, CMP - 0°, LMP - 180°

TUNL LTS - ON

TUNL VENT vlv - LM/CM ΔP

Verify LM/CM ΔP <0.2

*LM/CM ΔP >0.2

* Equalize CM/LM Pressure (Decal)*

Remove tunnel hatch (Decal)

Remove probe & stow (Decal)

Remove drogue & stow (Decal)

Verify docking tunnel index angle

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Open LM hatch
LMP transfer to LM
At LM request,
LM PWR - RESET, then OFF
SYS TEST - 7D
SYS TEST ind - 0 volts
Transfer PGA's, Helmets, Gloves & Wristwatch
CDR transfer to LM

ALIGN LM IMU TO CSM IMU

ATT DB - MIN
RATE - LO
LIMIT CYCLE - ON
SC CONT - SCS (verify)
MAN ATT (3) - RATE CMD
BMAG MODE (3) - ATT1/RATE2
V06 N20E
Voice ICDU angles to LM
Terminate attitude hold on LM cmd
V06 N20 (On LM request)
On LM MARK, Key ENTR
Compare CSM & LM ICDU ANGLES

<u>OG</u>		<u>IG</u>		<u>MG</u>	
CM	CM	CM	CM	CM	CM
LM	LM	LM	LM	LM	LM
<hr/>					
LM (IGA) _p = P20 + 180°					
LM (OGA) _y = 300° -R20 + Δφ					
LM (MGA) _r = 360° -Y20					

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VHF CHECKOUT

Establish AWAKE CONFIGURATION (S/1-27)
Configure for VHF Simplex B and respond
to LM comm check
Configure for VHF Simplex A

LM set MSN TMR to CSM MSN TMR on MARK

CMC/LGC CLOCK SYNC/TEPHEM UPDATE

V16 N65E (On LM request) _____:_____:_____
LM ENTR time on CSM MARK
V06 N65E on LM MARK and compare with
LM N65
CSM Time _____:_____:_____
LM Time _____:_____:_____
V05 N01E 1706E, Call TEPHEM to LM
R1 _____, R2 _____, R3 _____

PINK

C
4-6

Note: Rotation of docking interface may be performed at this point if desired.

DOCKING INTERFACE ROLL MNVR

COMPLETE IVT & CLOSEOUT

Restow LM Umbilicals in LM tunnel
Install drogue (Decal)
Install probe (Decal)
Preload probe (Decal)
LM hatch closed
Verify CSM roll cmds inhibited until
LM/CM $\Delta P > 3.5$ psid (> 4.0 psid, 4 jet)
Don PGA, Helmet & Gloves
Verify LM & CM Suit Check complete
Release docking latches (Decal)
Install tunnel hatch (Decal)
Perform hatch integrity check (Decal)

Perform Soft Undocking Switch Configuration
AUTO RCS - YAW, PITCH, B/D ROLL (12) - ON
A/C ROLL (4) - OFF
MAN ATT - ROLL - MIN IMP
PITCH, YAW - RATE CMD
LIMIT CYCLE - OFF
ATT DB - MIN
RATE - LOW
THC PWR - ON
RHC POWER NORM - AC/DC
RHC PWR DIR (2) - OFF
SC CONT - SCS
CMC MODE - FREE
BMAG MODE (3) - ATT1/RATE2
cb DOCKING PROBE (2) - close
PROBE RETR (2) - OFF (verify)
PROBE EXTD/REL - RETR
PROBE EXTD/REL tb (2) - bp (verify, 1 reqd)
PROBE EXTD/REL - OFF
cb SECS LOGIC (2) - close (verify)
cb SECS ARM (2) - close
Cue STDN for LOGIC ARM
SECS LOGIC (2) - on (up)
STDN go for PYRO ARM
SECS PYRO ARM (2) - on (up)

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4-7

PROBE EXT/REL-EXT/REL (mom) (Cue LM)
Verify Probe Extended, LM Attached
Allow Motion to Damp (5 sec)
CSM Roll Left to Optimum Position

CSM WT	ΔROLL
<30K	100°
30K-35K	80°
>35K	65°

If LM to perform rotation:
* SC CONT - CMC/AUTO *

At Completion of Roll Mvnr
Allow Motion to Damp (5 sec)
SC CONT - CMC (Cue LM)
PROBE EXT/REL - RETRACT
On LM Go - PROBE RETRACT - SEC 1 (PRIM 2)

At Dock Latch
PROBE EXT/REL tb (2) - gray

After Hard Dock
SECS PYRO ARM (2) - SAFE
SECS LOGIC (2) - OFF
cb SECS ARM (2) - open
cb DOCK PROBE (2) - open
THC - LOCKED
RHC - LOCKED
PROBE EXT/REL - OFF
PROBE RETRACT (2) - OFF
THC PWR - OFF
RHC PWR DIR (2) - OFF (verify)
BMAG MODE (3) - RATE 2
CMC MODE - AUTO

Prepare Couch for Hatch
Remove Probe Straps (A1)
CDR - verify FWD DUMP vlv - AUTO
CABIN FANS - ON
Equalize CSM/LM Pressure (Decal A)
Remove Hatch and Stow (Decal)
Verify Docking Latches (Decal)
Connect LM Umbilicals (both, if poss)
Remove and Stow Probe and Drogue (Decal)

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4-8

DPS/APS BURN MONITOR CHECKLIST

Copy P-30 Pad
TIG (_____ : _____ : _____)

V48E - R1 21102, R2 01111, (DPS)
R1 61102, R2 01111, (APS)

MNVR TO PAD BURN ATT
V49E

50:00
(-10:00) START DET
V37E 00E

PERFORM BORESIGHT & SXT STAR CHECK, if poss
V41 N91E

54:00
(-06:00) CMC MODE - FREE
BMAG MODE - ATT1/RATE 2

If APS Burn
SC CONT - SCS
LIMIT CYCLE-ON
ATT DB - MIN (verify)
RATE-LOW (verify)

EMS FUNC - ΔV SET/VHF RNG
Set ΔV = +100.0
EMS FUNC - ΔV
TVC SERVO PWR 1 - ACT/MNA

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58:00
(-02:00) V37E 47E
F 16 83 ΔV XYZ(CSM) (.1fps)

VI,HDOT,H available by N62
*KEY RLSE to return to N83 *

59:30
(-00:30) EMS MODE - NORMAL

59:58
(-00:02) If APS Burn
SC CONT - CMC
BMAG MODE (3) - RATE 2

00:00 IGNITION
After engine cutoff (on LM callout)
CMC MODE - AUTO
RECORD ΔV COUNTER & RESIDUALS
ΔVC _____ R _____
P _____
Y _____

PRO
F 37 00E
When CMC ACTY 1t out, V66E
EMS FUNC - OFF
EMS MODE - STBY
TVC SERVO PWR 1 - OFF
BMAG MODE (3) - RATE 2

If DPS/APS Burn go to C/4-8 for APS Burn
If DPS Burn Incomplete go to C/4-6 for
Docking Interface Roll Mnvr (if reqd)
and C/4-8 for APS Burn.

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LOSS OF COMM NAVIGATION

GENERAL RULES

- 1 A sighting or set is to consist of three marks.
- 2 Calibrate optics at the beginning of each batch and every half hour while navigation sightings in progress if the remaining sightings require more than 30 minutes to complete. The sextant calibration will be repeated until agreement of at least two checks (not necessarily sequential ones) are within 1 bit (.003°).
- 3 All attitude control should be done using coupled RCS thruster pairs.
- 4 See loss of comm midcourse prcdr. for mnvr times.
- 5 While in P23 V06N49 display:
If $\Delta R > 50$ nm, Or $\Delta V > 50$ fps;
Reject mark, reselect star and horizon,
verify procedures, and repeat mark.

If large correction re-occurs, accept.

Large ΔR , ΔV values may be expected at the following times:

At initiation of tracking (first mark of each star of first batch).

At first switch of reference bodies.

After long periods between sightings.

Last hours before EI.

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LOSS OF COMM NAV

6 Loss of W-Matrix after initiation of navigation sightings:

(a) Upon loss of W-Matrix, current onboard state vector is retained.

(b) W-Matrix Reinitialization and Navigation Procedures

(1) Sightings Not In Progress:

Before next batch, reinitialize W-Matrix, V67 V06N99 Load values shown in tables.

Continue Navigation

(2) Sightings In Progress:

Immediately reinitialize W-Matrix, V67 V06N99 Load values shown in tables.

Restart interrupted batch of navigation sightings.

Continue navigation

GENERAL PROCEDURE

1 If entry pad previously received, no tracking performed.

If not, proceed.

2 Execute abort - if required (unless comm loss during nominal TEC).

3 Reinitialize W-Matrix, V67 (diagonal values, V06N99, from tables)

4 Determine return time

5 Select navigation schedule (see Flight Plan No Comm P23 Schedule tables). If table I, II, or III are not applicable, refer to do-it-yourself procedures.

LOSS OF COMM NAV

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5-3

- 6 Select starting batch
first navigation sightings to use stars
corresponding to navigation schedule
time first occurring after abort.
- 7 Alternate sightings are provided in the event
the preferred sighting cannot be performed.
- 8 After each batch (or two batches if the batches
are back to back), determine entry time from P37
by calling N38 after integration has been completed
and before proceeding on the lat, long display.
- 9 Determine and record Hp using routine 30 V82 N44
by specifying the time load equal to entry time
determined in above step.
- 10 The state vector from each previous batch of
P23 sightings is retained in the LM state
vector slot until the navigator has determined
the current batch to be acceptable. When the
state vector from the current batch has been
determined to be acceptable, the state is
transferred to the LM state vector slot (V66).
If the batch is unacceptable, use V47 to
transfer the good state vector from the LM
slot to the CSM slot (do not reinitialize the
W-Matrix) and repeat current batch.

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DO-IT-YOURSELF PROCEDURES

- 1 Reinitialize W-Matrix and schedule a tracking
interval as soon as possible after the abort
burn; or in the case of the lunar flyby, about
1 hour after perilune. If sightings are per-
formed translunar for any reason, reinitialize
the W-Matrix 1 hour after perilune for trans-
earth sightings. W-Matrix values are given in
tables A and B for each return type.

C
5-4

- 2 A batch is to consist of at least three star/horizon sightings, although as many as five can be advantageous, particularly following a sleep period.
- 3 All available stars should be used in the sighting schedule. No more than three marks should be taken on a star within a batch of data.
- 4 Sightings during the last 10 hours before entry interface are important. Five earth horizon sightings should be scheduled at EI-5 hours and three earth horizon sightings should be scheduled following the MCC at EI-3 hours. If no earth horizon sightings are available, lunar horizon sightings should be used.
- 5 Whenever possible, the navigation batches should be scheduled so that, immediately following a time period of length Δt (not to exceed 3 hours) in a non-PTC mode, five times Δt should be spent in a PTC mode (thermal constraints). This rule will be violated most frequently in the following situations: (1) aborts from a translunar trajectory with short return lengths, (2) time critical aborts, (3) the 10-hour period before entry interface.
- 6 If possible, both near and far horizons should be included in each batch of data.
- 7 Star availability is related to GMT not GET. Therefore, as a clue to determine star availability, refer to Flight Plan No Comm P23 Schedule table which has a GMT for entry corresponding to your GMT for entry. In addition, the star charts should be used to select available stars.

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C
5-5

8 DO-IT-YOURSELF TABLES

A. ABORTS FROM TLC

W-MATRIX INITIALIZATION

R1 + 80000
R2 + 00070
R3 + 00003

NAVIGATION SCHEDULE

ΔT TO EI < 20 hrs
BATCHES OF 3 SETS EVERY 2.5 hrs
BATCH OF 5 SETS AT EI-5
(BEFORE LAST MCC AT EI-3)
BATCH OF 3 SETS AFTER LAST MCC

ΔT > 20 hrs
SLEEP PERIODS OF 8 HOURS MAY BE SCHEDULED.
CREW SHOULD BE AWAKE LAST 10 HOURS PRIOR
TO EI.

WHILE AWAKE:
BATCHES OF 3 SETS EVERY 3 HRS
BATCHES OF 5 SETS AFTER
SLEEP PERIODS
BATCH OF 5 SETS PRIOR TO
LAST MCC (AT EI-3)
BATCH OF 3 SETS AFTER LAST MCC

NOTE - ONLY STAR/EARTH HORIZON MARKS WILL BE MADE.

B. FLYBY, ABORT FROM LUNAR ORBIT, TEC.

W-MATRIX INITIALIZATION

1. COMM LOSS BEFORE BATCH 1
(at TEI + 1 or perilune +1 hr)

R1 + 30000
R2 + 00300
R3 + 00003

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2. COMM LOSS AFTER BATCH 1
(at TEI + 1 or perilune + 1 hr)
and
No SV update after TEI
R1 + 99000
R2 + 00020
R3 + 00003

3. COMM LOSS AFTER BATCH 1
(at TEI + 1 or perilune + 1 hr)
and
At least one SV update
after TEI
R1 + 45000
R2 + 00006
R3 + 00003

9 NAVIGATION SCHEDULE

A. RETURN LENGTH >70 hrs

- 1 Refer to Table III of Flight Plan No Comm P23 Schedules for placement of batches of star/horizon sightings and relate the times given at "TEI +" and "EI-" to the specific transearth situation. For each batch scheduled, take three marks on each available star (up to 5 stars).

- 2 Schedule three earth horizon sightings for every 5 hours between TEI + 32 and EI - 40 hours, or if an additional sleep period is needed for very slow returns, schedule five earth horizon sightings before the sleep period and five earth horizon sightings upon awakening.

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B. RETURN LENGTH <70 hrs

- 1 Sleep periods of 8 hours should be provided. Astronauts should be awake the last 10 hours before entry interface.
- 2 Three sets of star horizon observations should be scheduled every three hours while awake with five sets scheduled before and after each sleep period.
 - (a) A batch of lunar horizon sightings should be taken at TEI + 1 hour or perilune + 1 hr.
 - (b) The second batch of data should consist of earth horizon sightings.
 - (c) The third batch of data should consist of lunar horizon sightings.
 - (d) The remainder of the data should be earth horizon sightings. If no earth horizon sightings are available, lunar horizon sightings should be substituted.
- 3 Five earth/horizon sets should be scheduled at EI-5 hours before the MCC at EI - 3 hours. Three sets should be taken after the midcourse. If no earth horizon sightings are available, lunar horizon sightings should be substituted.

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MIDCOURSE PROCEDURES

Time Of Midcourse And Midcourse Execution Criteria

- 1 For midcourses following translunar coast aborts, execute the midcourse maneuvers whenever it is felt that a good estimate of the trajectory has been obtained by P23 and the ΔV shown by P37 is greater than 0 fps. The last midcourse maneuver should be executed no later than EI - 3 hours.

- 2 For midcourses following TEI, execute midcourse maneuvers at the times specified in the flight plan. These times are:
MCC5: TEI + 17 hours
MCC6: EI - 22 hours
MCC7: EI - 3 hours
These midcourse maneuvers should be executed only if the ΔV from P37 is greater than 0 fps.

Midcourse Maneuver Rules

Follow monitoring, shutdown and trim criteria as outlined in flight plan for MCC5, MCC6 and MCC7. Follow this criteria both for transearth midcourses and midcourses following TLC aborts.

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GENERAL INFORMATION

It can be determined if the entry corridor is being attained by determining Hp (vacuum perigee altitude) using the procedure outlined in the Loss-of-Comm Navigation General Procedure section, (steps 8-10) and comparing that value to the Hp Limits for Entry Corridor Table of the Flight Plan.

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NAVIGATION TIME DETERMINATION

- To determine GET of navigation, GET (nav), from tables defining time in EI-XX.

$$GET(EI) = TIG (abort) + \Delta T (P37)$$

Where: TIG (abort) = time (GETI) of abort

$\Delta T (P37) = \Delta t$ from TIG (abort) to EI
from P37

Computation:

TIG (abort)							
+ ΔT (P37)							
GET (EI)							

$$GET (nav) = GET (EI) - XX$$

GET (EI)							
-XX							
GET (nav)							
GET (EI)							
-XX							
GET (nav)							
GET (EI)							
-XX							
GET (nav)							

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- To determine GET of navigation, GET (nav), from tables defining time in TEI +YY

$$GET (nav) = GET (TEI) + YY$$

TIG							
+YY							
GET (nav)							
TIG							
+YY							
GET (nav)							

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CONTINGENCY JETTISON

NO COMM LM JETTISON

1 EARTH ORBIT - (LM/CSM CONTINGENCY DEORBIT)

MNVR TO POSIGRADE/HEADS DOWN ATTITUDE
POSITION 31.7° LINE ON HORIZON
USE P47 AND EMS TO MONITOR SEP MNVR

RETRO FIRE - 20 MIN

JETTISON LM
PERFORM -X 4 JET TRANSLATION (24 SEC)
MNVR TO RETRO FIRE ATTITUDE

2 TRANSLUNAR COAST - (DIRECT ABORT FROM TLC)

PITCH 180° FROM ABORT ATTITUDE
USE P47 AND EMS TO MONITOR SEP MNVR

ABORT BURN - 30 MIN

JETTISON LM
PERFORM -X TRANSLATION ($\Delta V = 1$ FPS)
MNVR TO ABORT BURN ATTITUDE

3 LUNAR ORBIT - (CONTINGENCY TEI)

(PERFORM ~ 1 HOUR (NO LATER THAN 30 MIN) PRIOR
TO TEI)

MNVR TO LV/LH ATT R = 180° (HEADS DOWN)
P = 000°
Y = 000°

USE P47 AND EMS TO MONITOR SEP MNVR

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NO COMM LM JETTISON

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TEI - 1 HR

JETTISON LM
PERFORM -X TRANSLATION (NET $\Delta V = 1$ FPS
RETROGRADE)
MNVR TO TEI ATTITUDE

4 TRANSEARTH COAST - LATE LM JETTISON)

(PERFORM ~ 1 HOUR TO 45 MIN PRIOR TO EI)
REALIGN IMU TO ENTRY REFSMMAT
MNVR TO INERTIAL ATT R = $+0^\circ$ (ARBITRARY)
P = $+196^\circ$
Y = $+45^\circ$

USE P47 AND EMS TO MONITOR SEP MNVR

EI - 1 HOUR

JETTISON LM
PERFORM -X TRANSLATION (NET $\Delta V = 3$ FPS)
MNVR TO ENTRY ATTITUDE

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NO COMM LM JETTISON

2. SERVICE MODULE JETTISON

SM JETTISON

PRIMARY GLYCOL TO RADIATORS - BYPASS (Pu11)
SM O2 SUPPLY - OFF
Power SM MAIN BUS
cb INSTR PWR CONTROL (4) - CLOSE (Pn1 276)
 or cb INSTR ESS MN A & MN B (2) - CLOSE (Pn1 5)
cb C/W MNA & MNB (2) - CLOSE (Pn1 5)
cb RCS SM HEATERS (4) - CLOSE (Pn1 8)
Verify SM RCS Quad Temps - If <60°:
 SM RCS HEATERS - as required
cb PYRO A SEQ A - CLOSE (Pn1 250)
cb PYRO B SEQ B - CLOSE (Pn1 250)
cb BAT A PWR ENTRY/PL - CLOSE (Pn1 250)
cb BAT B PWR ENTRY/PL - CLOSE (Pn1 250)
cb SECS LOGIC A & B (2) - CLOSE (Pn1 8)
cb SECS ARM A & B (2) - CLOSE (Pn1 8)
cb ELS/CM-SM SEP BAT A & B (2) - CLOSE (Pn1 8)
AUTO RCS SELECT A/C ROLL (4) - OFF
cb SPS PITCH & YAW (4) - OPEN (Pn1 8)
SM RCS PRIM PRPLNT (4) - OPEN (mom)
SM RCS SEC PRPLNT FUEL PRESS (4) - OPEN (mom)
CM RCS LOGIC - on(up)
RCS TRNFR - SM (mom)
MAIN BUS TIE BAT A/C - BAT A/C
MAIN BUS TIE BAT B/C - BAT B/C
cb MAIN A BAT BUS A - CLOSE (Pn1 275)
cb MAIN B BAT BUS B - CLOSE (Pn1 275)
Verify Voltage on BAT BUSES and PYRO BATS
RCS Ind - CM 1
CM RCS PRPLNT (2) - OPEN (mom)
SECS LOGIC (2) - on(up)
SECS PYRO ARM (2) - ARM
Verify Attitude Control
CM/SM SEP (2) - on(up)
C/W - CM
RCS TRNFR - CM (mom)
SECS PYRO ARM (2) - SAFE
SECS LOGIC (2) - OFF
cb SECS ARM A & B (2) - OPEN (Pn1 8)
cb ELS/CM-SM SEP BAT A & B (2) - OPEN (Pn1 8)

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SM JETTISON

CM RCS LOGIC - OFF

Verify CM RCS Pressure

cb RCS SM HEATERS (4) - OPEN (Pn1 8)

cb MAIN A BAT BUS A - OPEN (Pn1 275)

cb MAIN B BAT BUS B - OPEN (Pn1 275)

cb INSTR PWR CONTROL (4) - OPEN (Pn1 276)


cb BAT A PWR ENTRY/PL - OPEN (Pn1 250)

cb BAT B PWR ENTRY/PL - OPEN (Pn1 250)

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NO.	ITEM 	ACTION	BACKOUT

REAL TIME CHECKLIST

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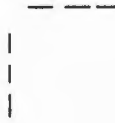


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EMERGENCY PROCEDURES
(Flight copies only)

see CSM SYSTEMS CHECKLIST

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EMERGENCY PROCEDURES