



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

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

CSM CONTINGENCY CHECKLIST

August 29, 1972

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**(10 sheets)

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CSM POWER CRITICAL LUNAR ORBIT

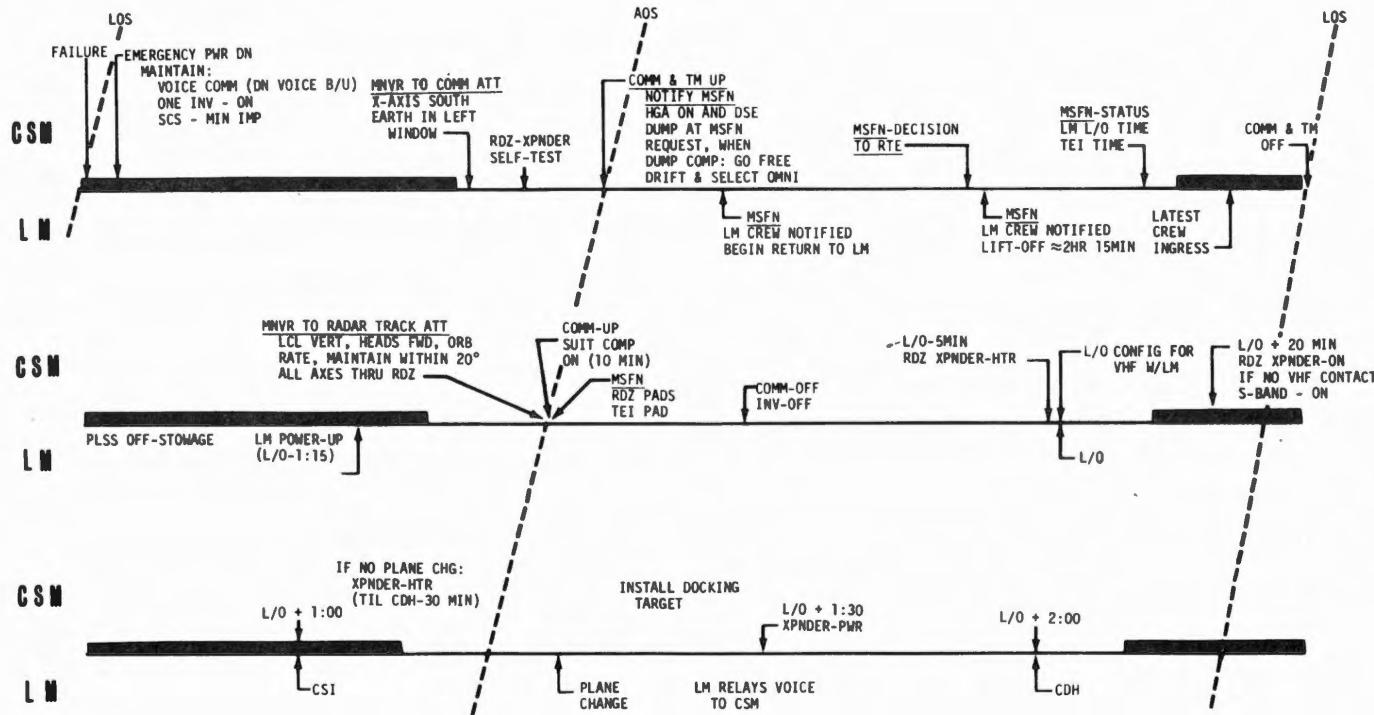
BACK

COLOR

CSM POWER CRITICAL LUNAR ORBIT

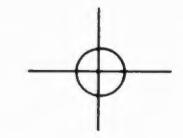
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CSM POWER CRITICAL (LM ON SURFACE)

LM ON SURFACE



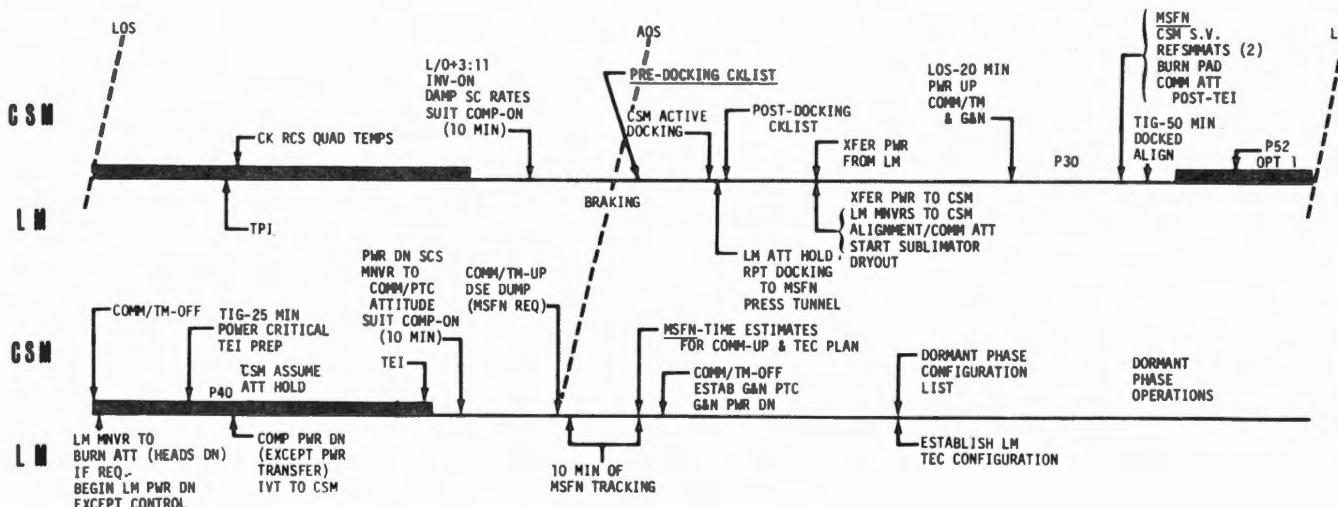
LM ON SURFACE



BACK

COLOR

1-2 C



CSM POWER CRITICAL (LM ON SURFACE)

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 (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

DATE 8/29/72

DATE

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)
 $P = 0^\circ, Y = 290^\circ$ (earth out left window)
MSFN perform tape dump
HGA PWR - OFF
UP TLM CMD - OFF

DATE | 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

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

Install DOCKING TARGET

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DATE



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

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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
FDI/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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DATE

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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)
REFSMMAT, 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

*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

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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*

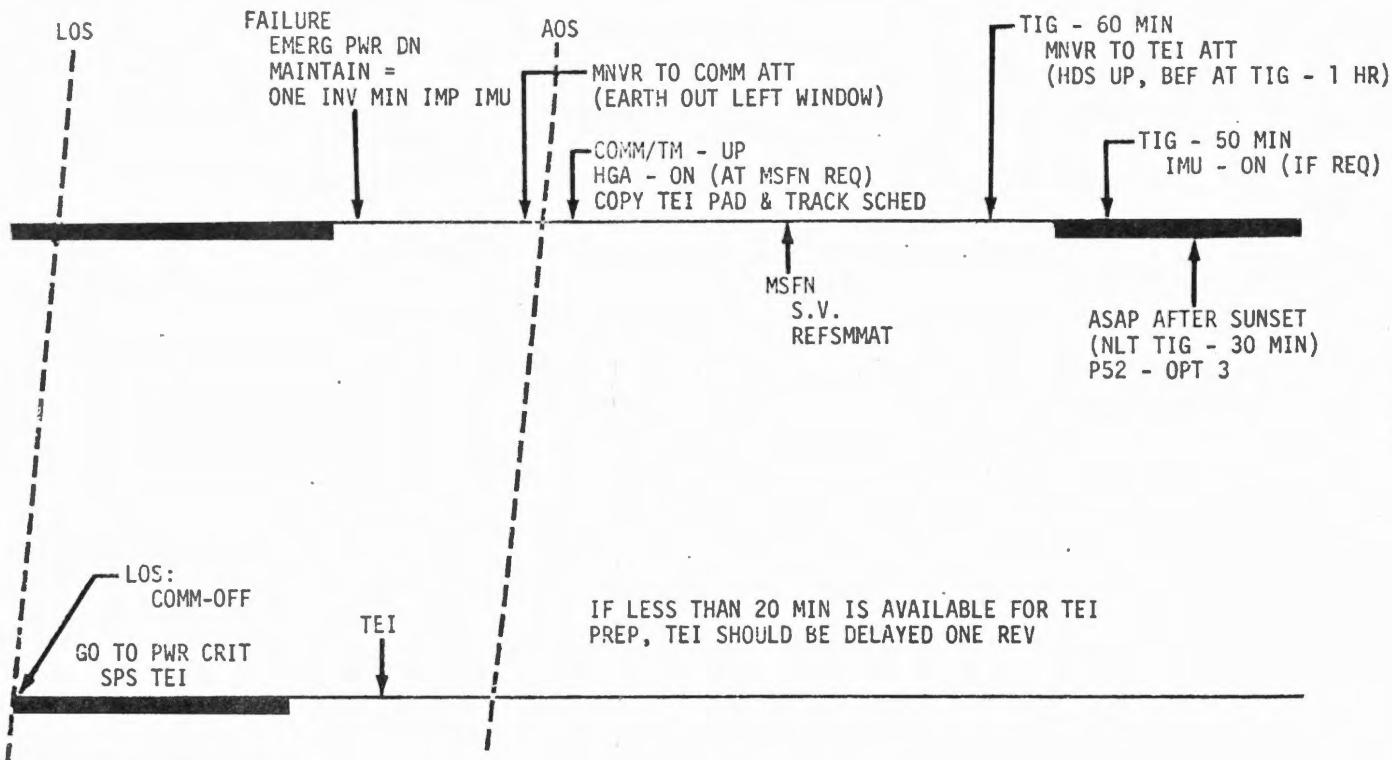
TIG -30 min DC IND SEL - MNA
FC 2 MNA - on (up)
DC volts > 26.5 vdc
BMAG PWR 1 - WARMUP

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

DATE

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DATE 8/29/72



CSM POWER CRITICAL (POST LM JETTISON)

POST LM JETT

BACK



COLOR _____

1-12

C

POST LM JETT

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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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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)
 $P = 0^\circ$, $Y = 290^\circ$ (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 00E
Verify OMNI
UP TLM - CMD RSET, then NORM
UP TLM CM - ACCEPT (State Vector (V66),
Clock Increment
Actual REFSMMAT,
TEI Burn Pad)

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

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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

DATE 8/29/72

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 v]v - 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

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)

DATE 8/29/72

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
(TRIM) BMAG MODE (3) - RATE 2
PRO
BMAG MODE (3) - ATT1/RATE 2
ENTR

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

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C
1-20

(REJECT) ENTR

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

FDAI SCALE - 5/1
RATE - HIGH
UPDATE DET

59:00 EMS MODE - NORMAL
(-01:00) 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

59:25 DSKY BLANKS
(-00:35)

59:30 (AVE G ON)
(-00:30)

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

59:XX ULLAGE
(-00:XX)

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

MONITOR Δ VM (R3) COUNTING UP

DATE

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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 OOE

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 GUDI) PRO to 06 40 *
(RECYCLE) ENTR to TIG-05sec

SPS THRUST Lt - ON
00:03 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

DATE 8/29/72 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

DATE

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

B MAG 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 OOE

When COMP ACTY lt out:
V66E

DATE

DATE 8/29/72

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

DATE 8/29/72

DATE

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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 ΔV C

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

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(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)

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
FDIAI SCALE - 5/1
LIMIT CYCLE - OFF
UPDATE DET

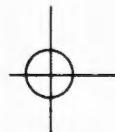
59:00
(-01:00)

(5)

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

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SCS w/G&N FAILED



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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 ACT - OFF
	INV 2 ACT - 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)

DATE

Complete EMERG PWR DOWN,
pg EMER/1-6

8/29/72

Establish DORMANT CONFIGURATION,
pg C/2-1

DATE

Post Before Page C/2-1

DATE 8/29/72

CSM POWER CRITICAL COASTING



CSM POWER CRITICAL COASTING



COLOR

BACK

DATE 8/29/72



DORMANT CONFIG LIST

DATE 8/29/72

C
2-1

CSM POWER CRITICAL COASTING

- 1
- 2 DORMANT CONFIGURATION LIST
- 3
- 4 PANEL 13 (ORDEAL)
- 5 FDAI SW (2) - INRTL
- 6 EARTH/LUNAR - PWR OFF
- 7 ALT SET - 60
- 8 LTG - OFF
- 9 MODE - HOLD/FAST
- 10
- 11 PANEL 15
- 12 COAS PWR - OFF
- 13 UTIL PWR - OFF
- 14 PL BCN LT - off (center)
- 15 PL VENT - OFF
- 16
- 17
- 18 PANEL 325
- 19 CAB PRESS RELF vlv (2) - NORMAL
- 20 PRIM GLY TO RAD vlv - BYPASS (pull)
- 21
- 22 PANEL 326
- 23 REPRESS PKG vlv - OFF
- 24 SM O2 SUPPLY vlv - OPEN
- 25 SURGE TK O2 vlv - OFF
- 26 GLY RSVR IN vlv - CLOSE
- 27 GLY RSVR BYPASS vlv - OPEN
- 28 GLY RSVR OUT vlv - CLOSE
- 29
- 30
- 31 PANEL 380
- 32 O2 DEMAND REG vlv - OFF
- 33 SUIT TEST vlv - OFF
- 34 SUIT CKT RET vlv - open (pull)
- 35
- 36 PANEL 7
- 37 EDS PWR - OFF
- 38 SCS TVC SERVO PWR #1 & #2 (2) - OFF
- 39 FDAO/GPI PWR - OFF
- 40 LOGIC 2/3 PWR - on (up)
- 41 SCS ELEC PWR - OFF
- 42 SCS SIG CONDR/DR BIAS 1 & 2 (2) - OFF
- 43 BMAG PWR (2) - OFF
- 44 DIRECT O2 vlv - close (CW)

BACK



COLOR _____

C
2-2

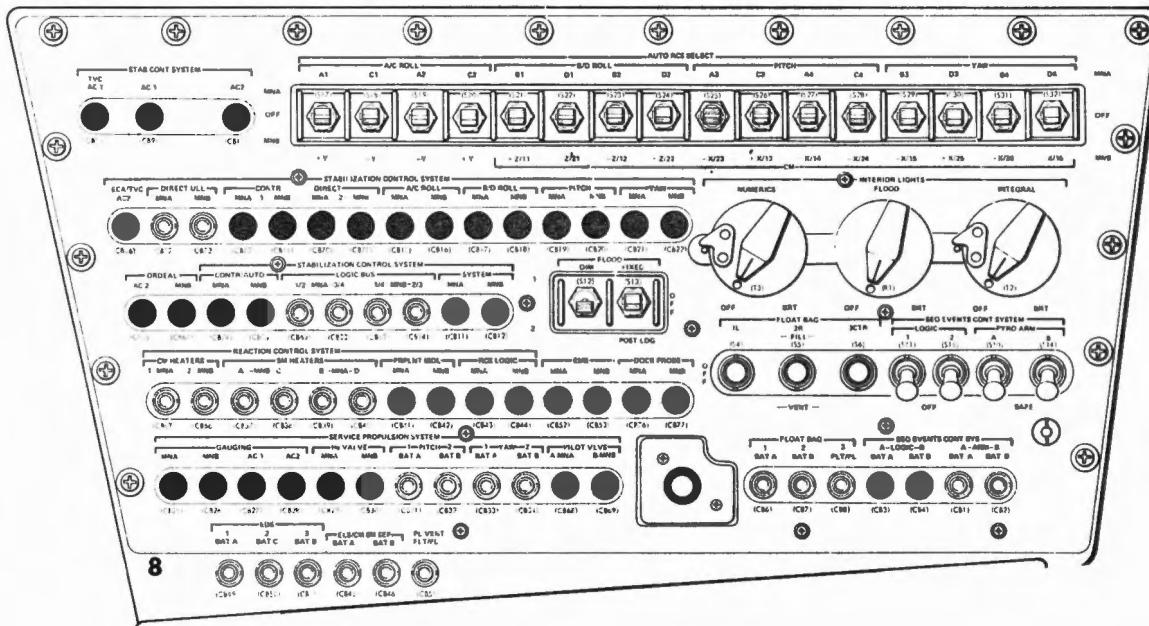
DORMANT CONFIG LIST

- 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 ΔV THRUST (2) - OFF (down) (guarded)
- 43 SCS TVC PITCH & YAW (2) - RATE CMD
- 44

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C
2-3



- - CLOSE
- - OPEN

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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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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

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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

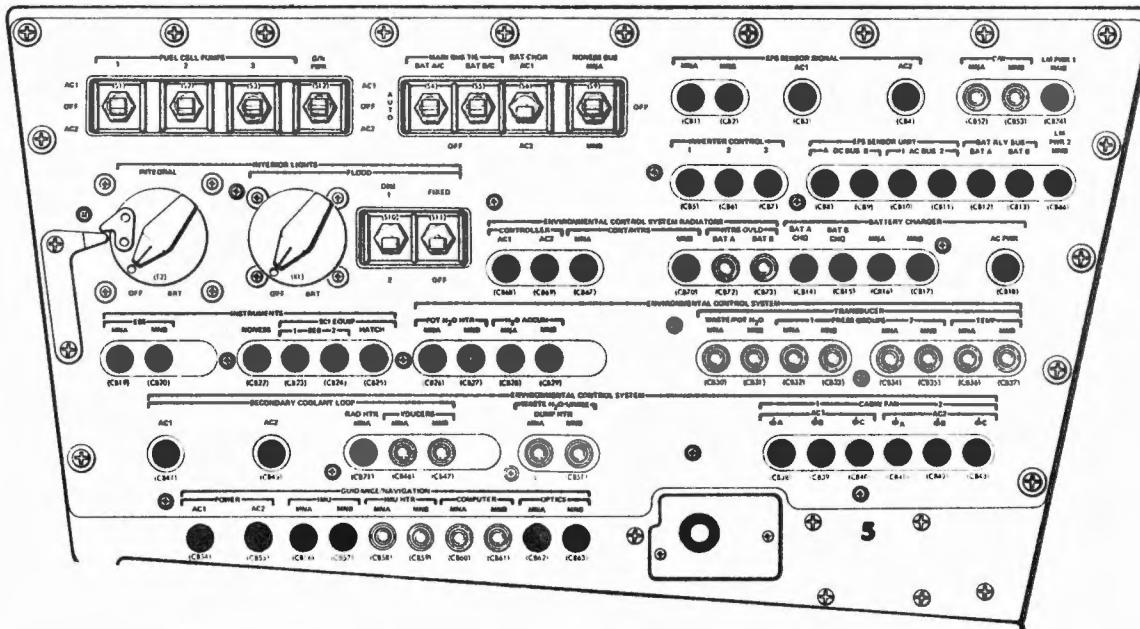
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C
2-7

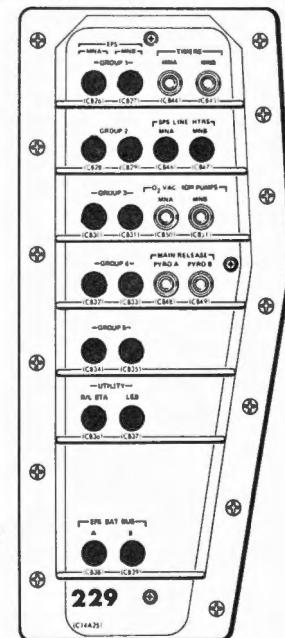


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C
2-8

- 1 PNL 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:
 cb FLIGHT/PL MN A & MN B (2) - close
 11
 12 PANEL 229
 13 cb Panel 229 all closed except:
 14 cb MAIN REL PYRO (2)- open
 15 cb O2 VAC ION PUMPS (2) - open
 16 cb TIMERS MNA & MNB (2) - open
 17
 18 PANEL 230
 19 MAP CAMERA ON - OFF
 20 MAP CAMERA TRACK - off (center)
 21 MAP CAMERA IMAGE MTN - OFF
 22 LASER ALTR - OFF
 23 DATA SYS ON - OFF
 24 IR - OFF
 25 LUNAR SOUNDER OPERATE - STBY
 26 LUNAR SOUNDER HF ANT (2) - ctr
 27 LUNAR SOUNDER RCDR - off (center)
 28 LUNAR SOUNDER RADAR - OFF
 29 LUNAR SOUNDER MODE - HF
 30 PAN CAMERA MODE - STBY
 31 PAN CAMERA SELF TEST - off (center)
 32 PAN CAMERA PWR - off (center)
 33 PAN CAMERA - MONO
 34 PAN CAMERA V/h OVRD - off (center)
 35 UV SPECT - OFF
 36
 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

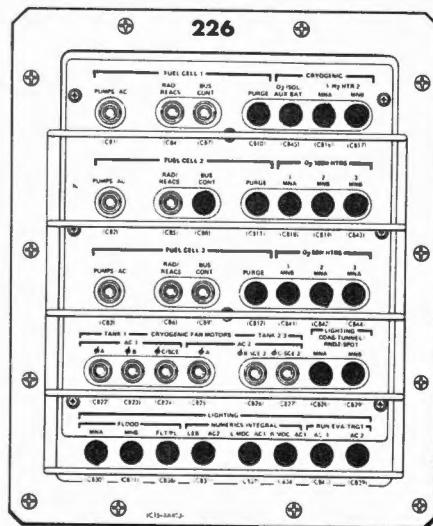
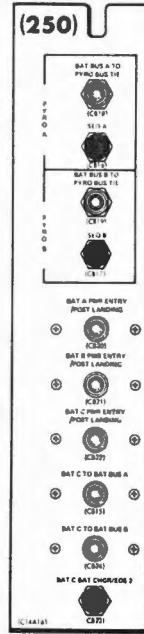


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C
2-9

- 1 PANEL 226, 250
 2 cb Panel 226 & 250 - see diagrams right
 3
 4 PANEL 251
 5 WASTE MGMT OVBD DRAIN v1v - OFF
 6
 7 PANEL 252
 8 BAT VENT v1v - CLOSED
 9 WASTE STOWAGE VENT v1v - 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 v1v - OFF
 23
 24 PANEL 300, 301, 302
 25 SUIT FLOW v1v (3) - FULL FLOW
 26
 27 PANEL 304
 28 DRNK H20 SUPPLY v1v - 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 H20 DUMP - OFF
 37 UR DUMP - OFF
 38
 39
 40
 41
 42
 43
 44



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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 v1v - CLOSE
- 23 PRESS RELF v1v - 2
- 24 POT TK IN v1v - OPEN
- 25 WASTE TK IN v1v - AUTO
- 26
- 27 PANEL 351
- 28 MAIN REG v1v (2) - close
- 29 H2O/GLY TK PRESS REG v1v - OFF
- 30 EMER CAB PRESS v1v - BOTH
- 31
- 32 PANEL 382
- 33 SUIT HT EXCH PRIM GLY v1v - FLOW (CCW)
- 34 SUIT FLOW RELF v1v - OFF
- 35 GLY EVAP IN TEMP v1v - MIN (CCW)
- 36 SUIT HT EXCH SEC GLY v1v - FLOW (CCW)
- 37 SEC EVAP H2O CONT v1v - AUTO
- 38 PRIM EVAP H2O CONT v1v - AUTO
- 39 H2O ACCUM v1v (2) - RMTE
- 40
- 41 PANEL 378
- 42 PRIM GLY ACCUM v1v - open (CCW)
- 43
- 44

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- 1 PANEL 379
2 PRIM ACCUM FILL v1v - OFF (CW)
- 3
- 4 PANEL 375
5 SURGE TK PRESS RELF v1v - open (CW)
- 6
- 7 PANEL 376
8 PLVC - NORMAL (up)
- 9
- 10 PANEL 377
11 GLY TO RAD SEC v1v - BYPASS (CCW)
- 12
- 13 PANEL 600
14 EMER 02 v1v - CLOSE
- 15
- 16 PANEL 602
17 REPRESS 02 RELF v1v - open (CW)
- 18
- 19 PANEL 601
20 REPRESS 02 v1v - 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 v1v - CLOSE
30 ACTR HNDL sel - stow/check locked
- 31
- 32 SIDE HATCH
33 CAB PRESS DUMP v1v - 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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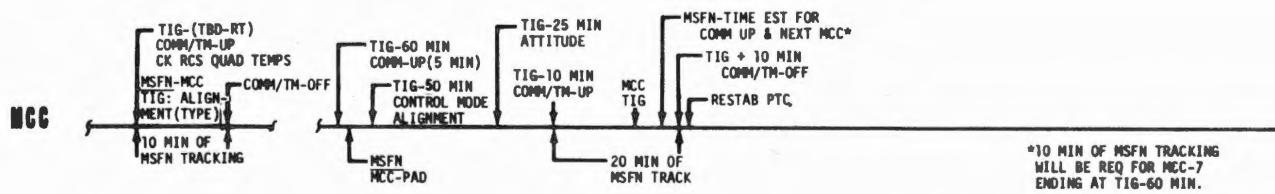
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2-12

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2-13 C

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°:

cb SM RCS HTRS (4) - close
RCS HTR - on until > 60°
Then, cb SM RCS HTRS (4) - open

COPY BURN & ALIGNMENT PADS

Set DET

COMM - OFF

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

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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)
FDAC/GPI PWR - 1
FDAC 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

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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

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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

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
FDAL 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
00:03 THRUST ON PB - PUSH
SPS THRUST Lt - ON
 ΔV THRUST B (A) - NORMAL
ULLAGE & THRUST ON PB - PUSH

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

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SCS MCC - SPS ΔV



C
2-19

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

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BACK



COLOR _____

C
2-20

SCS 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 Set ΔVC
(-10:00) EMS FUNC - ΔV
- (8) TVC CHECK & PREP
 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 cb MNA BAT BUS A - close
(-06:00) 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

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SCS MCC
SPS MIN PWR ΔV



C
2-21

55:00
(-05:00)

PRIMARY TVC CHECK
GMBL MOT PI-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
 Δ V THRUST A (B) - NORMAL
THC - ARMED
RHC (2) - ARMED

59:XX
(-00:XX)

ULLAGE

00:00

THRUST ON PB - PUSH

SPS THRUST Lt - ON

00:03

Δ V THRUST B (A) - NORMAL

ULLAGE & THRUST ON PB - PUSH

00:XX

ECO

Δ V THRUST A&B - OFF

GMBL MTRS (4) - OFF (LMP Confirm)

TVC SERVO PWR 1&2 - OFF

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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
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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SCS MCC - RCS ΔV

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 AV

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C
2-25

DORMANT SYSTEMS MANAGEMENT

ECS

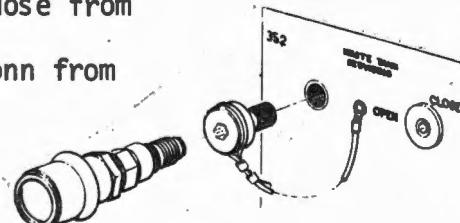
1 WATER PRESSURIZATION

MAIN REG vlv (either) - open
H2O/GLY TK PRESS REG vlv - BOTH, 1 or 2
To withdraw water cycle SURGE TK
02 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 02 vlv - OFF
Disconnect Urine Dump Hose from
PLSS H2O FILL conn
Disconnect Urine Bag conn from
PLSS H2O DRAIN conn

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ECS

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



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C
2-26

4 CM LiOH CANISTER UTILIZATION (IN CM)

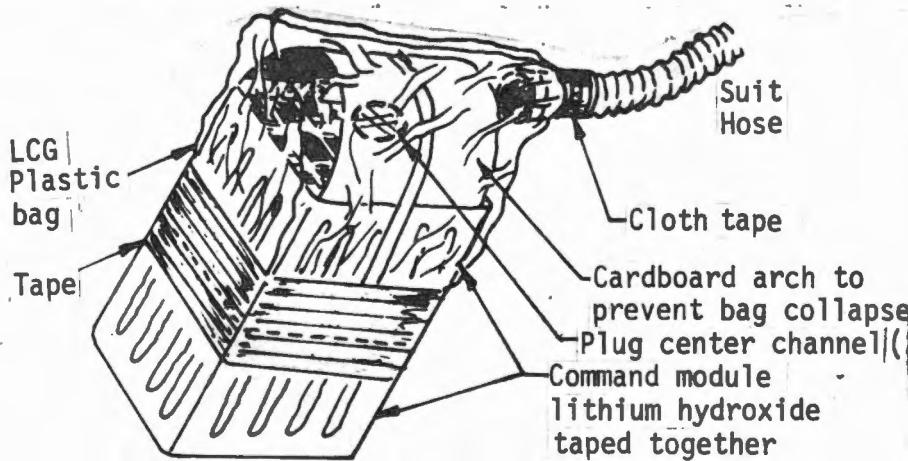
Refer to Diagram C/2-27

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



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6 METABOLIC MAKEUP WITH OPS O2

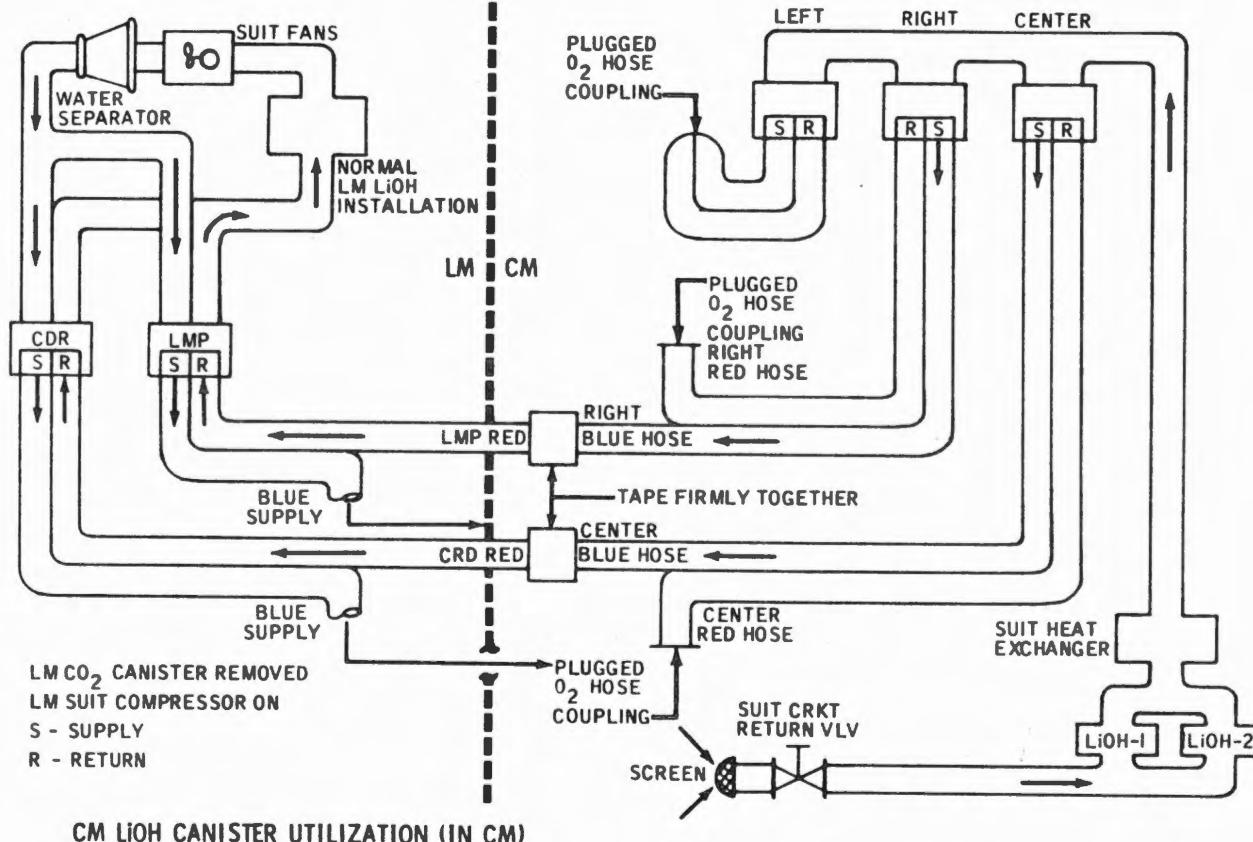
Verify OPS O2 conn Locked in STOWAGE PLATE
Cycle OPS ACTUATION LEVER as required
Flow Rate ~0.3 lb/hr.

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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C
2-27



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C
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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

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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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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)

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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

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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

8/29/72
DATE

COMM1A 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 **OFF**POWER PMP - NORM **OFF**

PCM BIT RATE - HIGH

PWR - AUDIO/TONE **OFF**

SUIT PWR - ON

Verify S/C Attitude and Select Best **OMNI**S BD NORMAL PWR AMPL - as required **OFF**1B TM (FOLLOWS BASIC ACTIVATION)S BD PWR AMPL - HIGH **OFF**S BD MODE PCM - PCM **OFF**

PCM BIT RATE - LOW

PROVIDE ADDITIONAL TM

SCE PWR - NORM **OFF**

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 **OFF**TAPE RECORDER RECORD - RECORD **OFF**TAPE RECORDER FWD - FWD **OFF**

PWR - AUDIO/TONE

SUIT PWR - ON

To add PCM Record See "PROVIDE ADDITIONAL TM" Above

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BACK



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C
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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) CHARGINGDATE 8/29/72
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 sel1 - A(B) [OFF]

DC INDICATOR sel1 - 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

BACK



COLOR _____

C
2-36

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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C
2-37

G&C

1 DISPLAY RATE (SCS) (FDI 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 (Pn1 8)

cb SCS LOGIC BUS MNB 1/4 - CLOSE (Pn1 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 (Pn1 8)

cb SCS LOGIC BUS MNB 1/4 - CLOSE (Pn1 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 (Pn1 5)

PRO, push (~5 sec), if reqd

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 (Pn1 5)

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G&C

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C
2-38

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

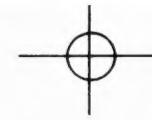
Configure for MN BUS POWER
G&N POWER OPTICS - on (up)
If Reticle Required
G/N PWR - AC1 or AC2 **OFF**

G&C

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CSM POWER CRITICAL ENTRY



CSM POWER CRITICAL ENTRY



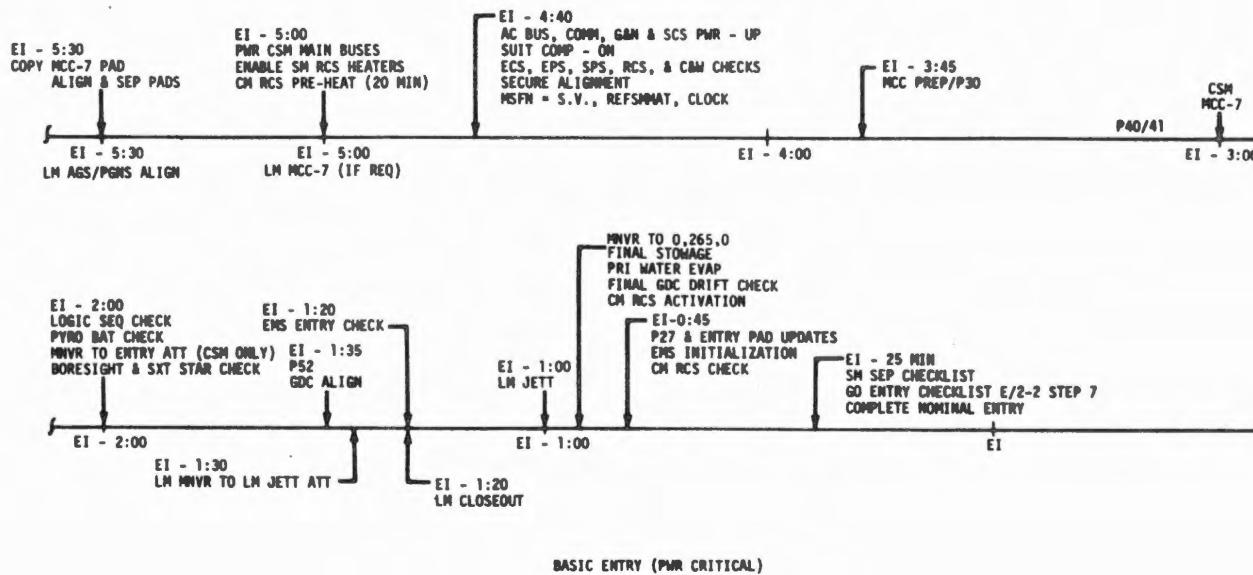
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BACK

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CSM/LM ATTACHED

BACK



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C
3-2

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CSM/LM ATTACHED

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C
3-3CSM 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
- 2 EI-5:00hr LM MCC-7
- 3 EI-4:55hr (250) POWER CSM MAIN BUSES
 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 (8) 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)
 cb CM RCS HTRS (2) - close
 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 COMM PWR UP
(225) 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 Pn1 6, 9, 10 for voice

9 G/N POWER UP
INTERIOR Ts (NUMERICS) - INCR
cb G/N COMPUTER (2) - close
PRO, push (~ 5 sec), if req'd
F37 OOE
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
 $CM(OGA)r = 300^\circ - LM\ OGA + \Delta\theta$
 $CM(IGA)p = LM\ IGA \pm 180^\circ$
 $CM(MGA)y = 360^\circ - LM\ MGA$

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V41 N20E, OG_____, IG_____, MG_____

V40E (free platform)

Set REFSMFLG:

V25 N7E, 77E, 10000E, 1E

Set DRIFTFLG:

V37E 51E, PRO, V37E 00E

C
3-5

(8) cb SCS LOGIC BUS (4) - close
FDIAI/GPI PWR - 1
FDIAI 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
 FDIAI/GPI PWR - OFF
 BMAG PWR (both) - ON
 (wait 90 sec)
 FDIAI/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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C
3-6

- 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 v1v - 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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C
3-7

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 vlv (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 1ts - off
 RANGE ind - 0.0
 Slew hairline over notch
 in self-test pattern
 EMS FUNC - EMS TEST 2 (wait 10 sec)
 .05G 1t - on (all others out)
 EMS FUNC - EMS TEST 3
 .05G 1t - on
 RSI lower 1t - on (10 sec later)
 Set RANGE counter to 58 nm ±0.0

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3-8

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

DATE

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C
3-9

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 pn1 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

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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

C
3-10

33

CM RCS ACTIVATION

cb SECS ARM (2) - close (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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C
3-11

38

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
O2 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

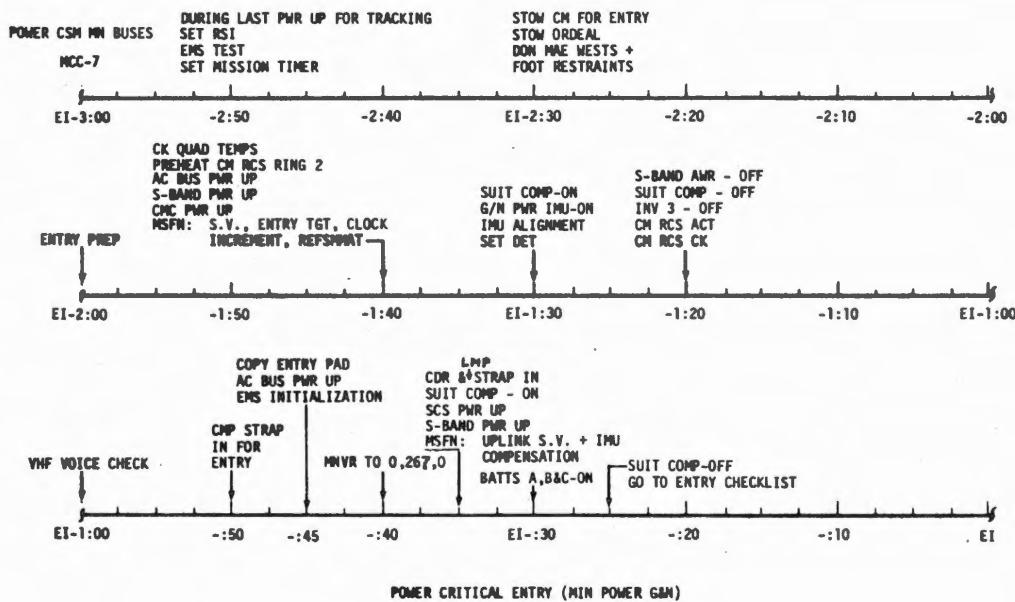
INV 1 - MNA
INV 2 AC1 - OFF
INV 1 AC1 - on (up)
AC1 RSET - RSET, on

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

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MIN PWR G&N

BACK



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C
3-14

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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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C
3-16

EI -2:00 hr ENTRY PREP

LIMIT CYCLE - OFF

RATE - HIGH

ROT CONTR PWR NORMAL (2) - AC/DC

SC CONT - CMC/FREE

B MAG 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 vlv (2) - OPEN

Configure Audio Pnls

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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AC BUS PWR UP
(275) 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

G/N PWR UP
(5) 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 lt - on (90 sec)
NO ATT lt - 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

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 (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

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

DATE 8/29/72

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

DATE

C
3-19

EI -40 min MNVR TO 0°, 267°, 0°

SC CONT - CMC/AUTO

V49E

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

(8) 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

DATE 8/29/72

DATE

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

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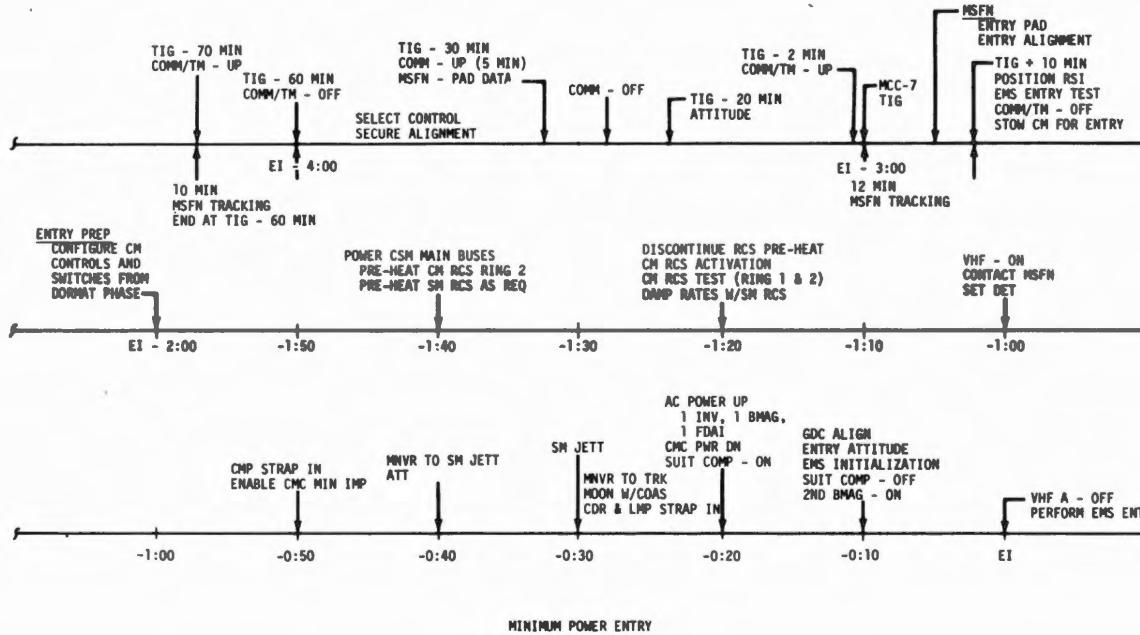
C
3-20

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DATE 8/29/72

DATE 8/29/72



3-21 C

MIN PWR SCS

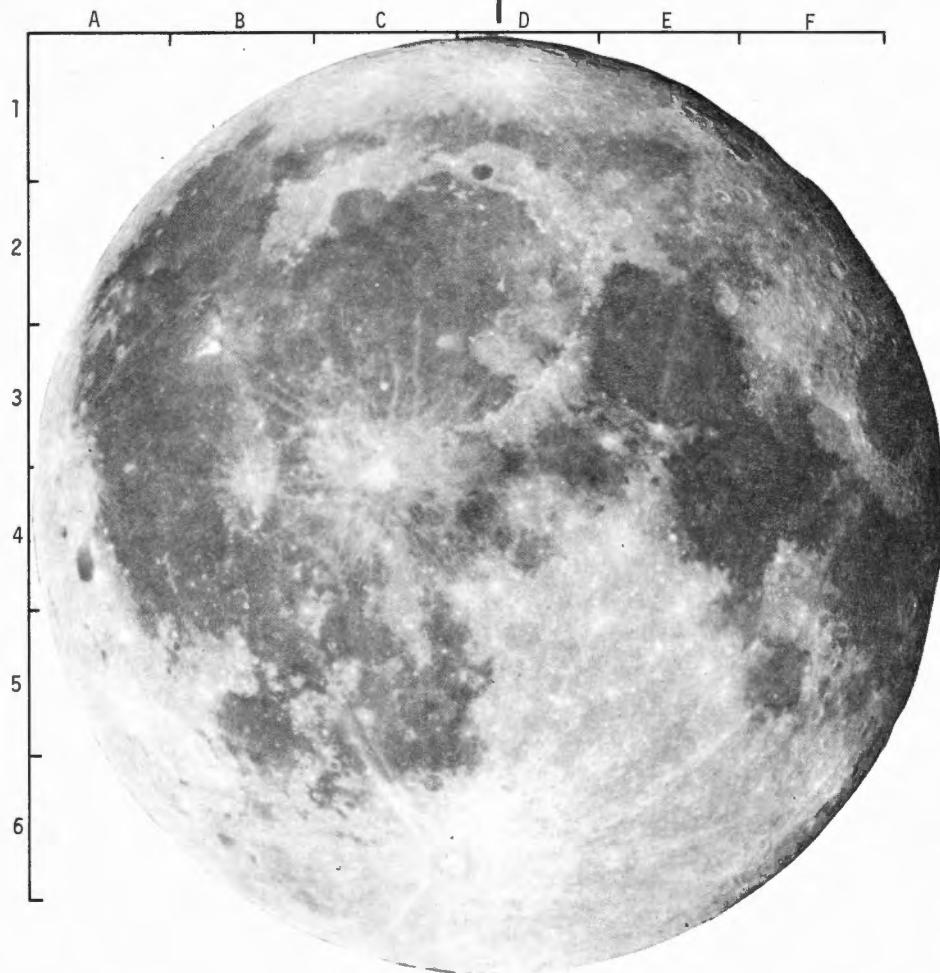
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C
3-22

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 Mis-
sion 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 vlv (2) - OPEN

Configure Audio Pnls

DATE 8/29/72

DATE

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

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

DATE

DATE - 8/29/72

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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

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)

DATE 8/29/72

DATE



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
(5) PRO, push (~5 sec) until STBY Lt - on
 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

DATE

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

DATE 8/29/72

DATE _____

Post Before Page C/4-1

DATE 8/29/72

ftnD

GENERAL CONTINGENCY PROCEDURES

GENERAL CONTINGENCY PROCEDURES

BACK

COLOR Buff

DATE 8/29/72

PINK

C
4-1

LOI 30 MIN DPS ABORT

ΔV THRUST A/B - OFF
SPS INJ vlv (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

LOI ABORTS

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

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

ALTERNATE

DATE 8/29/72

PRIMARY
G&N ΔVM
ΔVC ABORT(Chart) _____

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

BACK



COLOR PINK

C
4-2

1

MNVR TO PAD BURN ATTITUDE
V62E

2

F 06 22

V49E
NEW ICDU ANGLES RPY
Load desired angles
PRO

(.01°)

3

F 50 18

REQ MNVR TO FDAI RPY ANGLES
(AUTO) BMAG MODE (3) - RATE 2
SC CONT - CMC
CMC MODE - AUTO

(.01°)

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)

F 16 83

V37E 47E

ΔV XYZ(CSM)

(.1fps)

VI,HDOT,H available by N62E
*KEY RLSE to return to N83 *

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

LOI ABORTS

DATE 8/29/72

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PINK

C
4-3

RECORD ΔV COUNTER & RESIDUALS

ΔVC	R
	P
	Y

F 37 00E

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

DATE 8/29/72

DATE _____

PINK

C
4-42 LOI 2 HR DOCKED DPS/APS ABORT

ΔV THRUST A/B - OFF
 SPS INJ v1vs (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

VGX	R
VGY	P
VGZ	Y

PRO

F 37 OOE

When CMC ACTY lt 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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C
4-5

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

OG	IG	MG
CM	CM	CM
LM	LM	LM
LM (IGA)p = P20 + 180°		
LM (OGA)y = 300° - R20 + Δθ		
LM (MGA)r = 360° - Y20		

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 _____

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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 cmd inhibited until
LM/CM ΔP >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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C
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

If LM to perform rotation:

* SC CONT - CMC/AUTO *

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

At Completion of Roll Mnvr

Allow Motion to Damp (5 sec)

SC CONT - CMC (Cue LM)

PROBE EXTD/REL - RETRACT

On LM Go - PROBE RETRACT - SEC 1 (PRIM 2)

At Dock Latch

PROBE EXTD/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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C
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 OOE

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 - AC1/MNA

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PINK

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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 lt 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 NAVIGATIONGENERAL 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.

C
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 performed 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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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

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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

C
5-6

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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5-7

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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C
5-8

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.

DATE

DATE 8/29/72

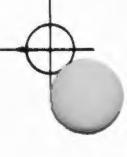
C
5-9

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.

DATE 8/29/72

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5-10NAVIGATION TIME DETERMINATION

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

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

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

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

Computation:

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

$$GET(\text{nav}) = GET(EI) - XX$$

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

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

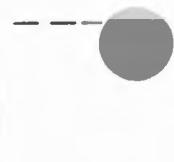
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$$GET(\text{nav}) = GET(\text{TEI}) + YY$$

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



C
6-1

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

DATE 8/29/72

NO COMM LM JETTISON

BACK



COLOR _____

C
6-2

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°(ARBITRARY)
P = +196°
Y = +45°
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

DATE 8/29/72

NO COMM LM JETTISON



C
6-3

2. SERVICE MODULE JETTISON

PRIMARY GLYCOL TO RADIATORS - BYPASS (Pn1)

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)

DATE 8/29/72

SM JETTISON

BACK



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C
6-4

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)

DATE 8/29/72

5

REAL TIME CHECKLIST

BACK



COLOR _____

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REAL TIME CHECKLIST

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EMER
1-1

EMERGENCY PROCEDURES
(Flight copies only)

see CSM SYSTEMS CHECKLIST

DATE 8/29/72

EMERGENCY PROCEDURES