NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

APOLLO 17

ALL LAUNCH DATES

BASIC

CSM EXP/EVA CHECKLIST

PREPARED BY

EVA & EXPERIMENTS BRANCH
CREW PROCEDURES DIVISION

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS
SEPTEMBER 29, 1972
APOLLO 17

CSM EXP/EVA CHECKLIST

SEPTEMBER 29, 1972

PREPARED BY: J. K. PATTERSON
BOOK MANAGER

APPROVED BY: D. C. SCHULZ, CHIEF
EVA & EXPERIMENTS BRANCH

It is requested that any organization having comments, questions, or suggestions concerning this document contact J. K. Patterson, Flight Planning Branch, CG54, Building 4, room 233, telephone 483-5871.

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes should be submitted to the Apollo Flight Data File Manager, T. W. Holloway, CG5, Building 4, room 230, telephone 483-4271.

Distribution of this document is controlled by Flight Data File Manager T. W. Holloway, Flight Planning Branch, Crew Procedures Division.
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Any organization having specific comments regarding a particular area of responsibility should contact the individual(s) listed above.
## Apollo 17

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SIM EXPERIMENTS

1 SIM EXP PREP

1 SIM BASIC CONFIGURATION
AUTO RCS SELECT - OFF (Pn1 8)
   except A1,C2 (or D1,B2), A3,C4,B3,D4
   (Note: Use D1, B2 for transearth coast)
PCM BIT RATE - HIGH (Pn1 3)
S-BD AUX TV - SCI
SM/AC PWR - ON (Pn1 181)
LOGIC PWR (2) - DPLY/RETR
MAP CAM ON - STBY
MAP CAM TRACK - RETRACT
LS OPERATE - STBY
LS HF ANTENNA 1 & 2 - OFF
IMAGE MTN - OFF
LASER ALTM - OFF
RCDR - OFF
RADAR - OFF
MODE - HF
DATA SYS ON - ON
IR - ON
PAN CAM SELF TEST - HTRS
PAN CAM STEREO - STEREO
PAN CAM MODE - STBY
PAN CAM PWR - off (ctr)
V/h OVRD - off (ctr)
UV SPECT - ON
Verify map cam retr (tb - gray)
MAP CAM/LASER EXP COVERS - CLOSE (Pn1 278)
IR EXP COVER - CLOSE
UV EXP COVER - CLOSE
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIM ATT</td>
<td>MAP CAMR (COVER/POSITION)</td>
<td>LS HF ANT</td>
<td>IR COVER</td>
<td>UV COVER</td>
</tr>
<tr>
<td>+ XFWD</td>
<td>0 CLOSED</td>
<td>0 RETR</td>
<td>0 CLOSED</td>
<td>0 CLOSED</td>
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<tr>
<td>- XFWD</td>
<td>1 OPEN/EXTD</td>
<td>1 EXTD</td>
<td>1 OPEN</td>
<td>1 OPEN</td>
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<tr>
<td>* NON SIM</td>
<td>2 OPEN/RETR</td>
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<table>
<thead>
<tr>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
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<tbody>
<tr>
<td>PAN CAMR</td>
<td>MAP CAMR/LASER ALTM</td>
<td>LS</td>
<td>IR</td>
<td>UV</td>
</tr>
<tr>
<td>0 OFF/STBY</td>
<td>0 OFF/STBY</td>
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<td>1 OFF</td>
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<tr>
<td>1 PWR/STBY</td>
<td>1 STBY/STBY</td>
<td>1 HF MODE</td>
<td>1 ON</td>
<td>1 ON</td>
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<tr>
<td>2 PWR/OPERATE</td>
<td>2 ON/ON</td>
<td>2 VHF MODE</td>
<td></td>
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<tr>
<td>3 BOOST/STBY</td>
<td>3 STBY/STBY</td>
<td>3 RECEIVE ONLY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 ON/OFF</td>
<td>4 ON/OFF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 ON (IMC OFF)/OFF</td>
<td>4 STBY</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DATE** 9/29/72
3 PRE-SPS BURN PREP
LASER ALTM - OFF
ANTS, CAMR, & COVERS - RETR
LOGIC PWR (2) - OFF
SM/AC PWR - ON
MAP CAM ON - STBY
IMAGE MTN - OFF
PAN CAM PWR - BOOST

(Pnl 181)

4 POST-SPS BURN PREP
PAN CAM PWR - OFF
LOGIC PWR (2) - DPLY/RETR

5 PWR DOWN - MIN PWR
BASIC CONFIGURATION (1.1) complete
MAP CAM ON - OFF
PAN CAM SELF TEST - off (ctr)
RCDR - OFF
IR - OFF
UV SPECT - OFF
SM/AC PWR - OFF
S-BD AUX TV - off (ctr)
DATA SYS ON - OFF

(Pnl 181)

6 KILL PWR
NONESS BUS - OFF

(Pnl 5)
7 OTHER SIM CONFIGURATIONS

1 SLEEP
ATT - +X fwd, 2.5° db
MAP CAM ON - STBY
LASER ALTM - OFF
Pan Cam PWR - OFF
UV and IR - COVER OPEN and ON

2 SIM BAY SECURE (Dumps, Thermal)
MAP CAM ON - STBY
Laser - OFF
Camr retr and covers closed
Pan Cam PWR - OFF
IR - ON/cover closed
UV - ON/cover closed

3 SIM BAY SECURE (Thruster)
SIM BAY SECURE (7.2) and ANT retracted

8 TALKBACK SUMMARY

MAP CAM - ON TB
1. T<45° or T>110°F, ON SW - ON or STBY
2. ~4 sec bp when IMAGE MTN
   mechanism ON to OFF or OFF to ON (if MAP
   CAM ON sw is STBY)
3. IMAGE MTN SW in INCR; IMC set at nominal
   60NM (if MAP CAM ON sw is ON)

MAP CAM - TRACK EXTEND TB
BP when track is not fully extended or fully
retracted (and TRACK sw in EXTEND or RETRACT)

PAN CAM TB
1. Malfunction when in OPERATE mode
   A. Lens rotation stops
   B. No film motion
   C. Supply spool empty (15-sec delay)
   D. No stereo gimbal (if in STEREO)
   E. Capping shutter failure
2. 2 sec bp when PWR SW, OFF to PWR
3. 2 sec bp when MODE SW, STBY to OPERATE
   (with PWR on)
4. 1 min bp during SELF TEST. If
   failure, 2 sec gray then bp.
LS HF ANT EXTEND TB (2)
BP when ant not completely in or out
(and EXTEND sw in EXTEND or RETRACT)

LS HF ANT JETT TB
Gray - normal jett (JETT sw in JETT)
BP (JETT sw in JETT and EXTEND sw off)
- jett failure

LS OPERATE TB
BP ~3 sec, then gray, when RCDR & RADAR ON
and OPERATE sw STBY to OPERATE

If bp >5 sec:
1. Radar out of temp limits
2. Xmit pwr too low
3. Non-acceptable frequency
4. No film motion

BP ~3 sec, then gray,
when RADAR ON and OPERATE
sw OPERATE to STBY

If bp > 5 sec:
RADAR out of temp limits

COVER TB (3) (Pnl 278)
BP ~2 sec when cover not completely
open or closed (and cover sw in OPEN or
CLOSED)

9 SCIENTIFIC DATA SYSTEM PREP
PCM BIT RATE - HIGH
S-BD AUX TV - SCI
DATA SYS ON - ON

Data system shutdown (as reqd)
IR - OFF
UV - OFF
DATA SYS ON - OFF
S-BD AUX TV - off (ctr)
10 SIM DOOR JETT

Verify:
- MAP CAM TRACK - OFF (tb - gray)
- LS OPERATE - STBY
- HF ANTENNA 1 & 2 - off (ctr)
- MAP CAM IMAGE MTN - OFF
- LASER ALTM - OFF
- RCDR - off (ctr)
- RADAR - OFF
- LS MODE - HF
- DATA SYS ON - ON
- PAN CAM SELF TEST - off (ctr)
- PAN CAM STEREO - STEREO
- PAN CAM MODE - STBY (tb - gray)
- PAN CAM V/h OVRD - off (ctr)
- UV SPECT - OFF
- SM/AC PWR - ON
- S-BD AUX TV - SCI
- IR - ON
- MAP CAM ON - STBY (possible bp during warmup)

On STDN cue,
- PAN CAM PWR - PWR (tb-bp 2 sec - gray)
- Wait 2 min
- PAN CAM PWR - BOOST
- FC REACS VALVES - LATCH (Pnl 3)
- cb LOGIC PWR (2) - close (Pnl 181)
- LOGIC PWR (2) - JETT
- Go/no go for SIM door jett (cue STDN)
- DOOR JETT - jett (up)
- DOOR JETT - off (down)
- LOGIC PWR (2) - off (ctr)
- FC REACS VALVES - NORM
- SM RCS PRPLNT tb (8) - gray (verify) (Pnl 2)
- SM RCS He tb (8) - gray (verify)
- SM RCS SEC PRPLNT FUEL PRESS (4) - close
- PAN CAM SELF TEST - HTRES
- UV SPECT - ON
- IR - OFF (on STDN cue)
2 INFRA-RED SCANNING RADIOMETER

Exp - Laser altimeter opr, data system opr (1.9)
Lunar sounder off
FOV - 162° crosstrack scan, instr FOV 1.26°,
ground coverage (60NM) 2.2 KM at nadir
Sun avoidance - same as FOV
ATT - +X fwd, <3.5° db
Dumps - none for 1 hr prior to and during opr

1 ACTIVATION
DATA SYS ON - ON (verify)
IR - ON

2 COVER OPEN
LOGIC PWR (2) - DPLY/RETR
IR EXP COVER - OPEN (tb-bp 2 or 3 sec-gray)

3 COVER CLOSE
LOGIC PWR (2) - DPLY/RETR
IR EXP COVER - CLOSE (tb-bp 2 or 3 sec-gray)

4 TERMINATION
IR - OFF

DATE 9/29/72
3 FAR ULTRA-VIOLET SPECTROMETER

Exp - Lunar Sounder off
FOV - 12° X 20° rect (optical); 60° X 90° (unobstructed)
Sun avoidance - 20° to LOS (opr)
Att - mode 1: Near side terminator, +X fwd, +5° of nadir, 3°db
2: Far side terminator, -X fwd, ±5° of nadir, 3°db
3: Lunar grazing
4: Solar atmosphere
5: Stellar targets, TEC; LOS directed to selected celestial points
6: PTC Galactic Scan +X tilted away from sun

Dumps - none except special cases

1 ACTIVATION
DATA SYS ON - ON (verify)
UV SPECT - ON

2 COVER OPEN
LOGIC PWR (2) - DPLY/RETR
UV EXP COVER - OPEN (tb-bp 2 or 3 sec-gray)

3 COVER CLOSE
LOGIC PWR (2) - DPLY/RETR
UV EXP COVER - CLOSE (tb-bp 2 or 3 sec-gray)

4 TERMINATION
UV SPECT - OFF
4 LUNAR SOUNDER
EXP - all other expts prohibited during all LS operate and receive-only modes
HIGH GAIN ANT must be off in HF and Receive-Only modes
No LS operation when docked with or within 1000 feet of LM to prevent inadvertent firings of LM pyros

1 ENABLE TLM
LUNAR SOUNDER OPERATE - STBY (verify)

CAUTION
*The OPERATE sw must be in STBY*
*before going RCDR - ON to *
*prevent film usage. *

RCDR - ON
MODE - HF
RADAR - ON

2 STANDBY
LS OPERATE - STBY
RCDR - ON
RADAR - ON

3 HF ANTENNAE DEPLOY
LOGIC PWR (2) - DPLY/RETR (Pn1 181)
PCM BIT RATE - HIGH
DATA SYS ON - ON
HF ANTENNA 1 - EXTEND (tb-bp ~1:05-gray)
  - OFF (on STDN cue)
HF ANTENNA 2 - EXTEND (tb-bp ~1:20-gray)
  - OFF (on STDN cue)

CAUTION
*If no tb response within 12 sec*
*or if tb-bp > 2:00 *
*HF ANTENNA - off (ctr) *
*Refer to Malif. Proc. X/1-27 *
4 HF MODE ACTIVATION
At T-30 min,
LS OPERATE - STBY
RCDR - ON
RADAR - ON
RCDR - OFF
HF Antennae Deploy (4.3) complete
MODE - HF

Secure SIM bay:
MAP CAM ON - OFF
LASER ALTM - OFF
IR - OFF
PAN CAM SELF TEST - off (ctr)
PAN CAM PWR - off (ctr)
UV SPECT - OFF
HIGH GAIN ANT POWER - OFF
PCM BIT RATE HIGH - LOW
DATA SYS ON - OFF
SM/AC PWR - OFF

At T-15 min,
RCDR - ON

At T-START,
LS OPERATE - OPERATE

5 HF MODE TERMINATION
At T-STOP,
LS OPERATE - STBY
At T-STOP + 1 min,
RCDR - OFF
RADAR - OFF
SM/AC PWR - ON

6 VHF MODE ACTIVATION
At T-30 min,
LS OPERATE - STBY
RCDR - ON
RADAR - ON
RCDR - OFF
MODE - VHF
Secure SIM bay:
MAP CAM ON - OFF
LASER ALTM - OFF
IR - OFF
PAN CAM SELF TEST - off (ctr)
PAN CAM PWR - off (ctr)
UV SPECT - OFF
DATA SYS ON - OFF
SM/AC PWR - OFF

At T-15 min,
RCDR - ON

At T-START,
LS OPERATE - OPERATE

7 VHF MODE TERMINATION
At T-STOP,
LS OPERATE - STBY

At T-STOP + 1 min,
RCDR - OFF
RADAR - OFF
SM/AC PWR - ON

8 RECEIVE ONLY
At T-30 min,
LS OPERATE - STBY
RCDR - ON
RADAR - ON
RCDR - OFF

HF Antennae Deploy (4.3) complete
MODE - HF

Secure SIM bay:
MAP CAM ON - OFF
LASER ALTM - OFF
IR - OFF
PAN CAM SELF TEST - off (ctr)
PAN CAM PWR - off (ctr)
UV SPECT - OFF
DATA SYS ON - OFF
HIGH GAIN ANT POWER - OFF
SM/AC PWR - OFF

At T-START,
Configure DSE(HBR/RCD/FWD/CMD RESET)

At T-STOP,
RADAR - OFF
SM/AC PWR - ON
9 HF ANTENNAE RETRACT
LOGIC PWR (2) - DPLY/RETR
PCM BIT RATE - HIGH
DATA SYS ON - ON
HF ANTENNA 1 - RETRACT (tb-bp ~1:35-gray)
- OFF (on STDN cue)
HF ANTENNA 2 - RETRACT (tb-bp ~1:35-gray)
- OFF (on STDN cue)

CAUTION
*If no tb response within 12 sec*
*or if tb-bp >2:00,
*HF ANTENNA - off (ctr)
*Refer to Malf. Proc. X/1-28

10 HF ANTENNAE JETTISON
P20 OPT 5 MNVR to JETTISON ATTITUDE
N78 (+000.00)
(+000.00)
(+180.00)
LOGIC PWR (2) - JETT
HF ANTENNA 1 & 2 - OFF (ctr) for proper tb indication

When in attitude:
HF ANTENNA JETT - JETT (mom)(tb-gray)
LOGIC PWR (2) - DPLY/RETR

5 PANORAMIC CAMERA

FOV - lens: 12.5° half-angle cone
39° fore/aft x 108° crosstrack (stereo)
11° fore/aft x 108° crosstrack (mono)
Sun avoidance - 66° fore/aft, 90° side (opr)
V/H sensor: +10° LOS
Att - +X fwd
+ 1/2° of nadir, 1/2° db
Thermal - 30 min max continuous opr
opr temp <85°, degraded resolution
15 min max sun on lens barrel (stowed)
Dumps - none for 3 hr prior to exp opr
exp off; lens stowed
1 BOOST MODE (SPS MNVRS, LAUNCH, and TLI)
   NONESS BUS - MNA
   PAN CAM PWR - BOOST
   After SPS mnvr,
   PAN CAM PWR - off (ctr)

2 TEMP CONTROL (continuous after door jett)
   SM/AC PWR - on (up)
   PAN CAM SELF TEST - HTRS
   To turn htrs off,
   PAN CAM SELF TEST - OFF

3 ENABLE TLM
   Data sys prep complete (verify)
   SM/AC PWR - on (up)
   PAN CAM MODE - STBY (verify)
   PAN CAM PWR - PWR (tb-bp 2 sec-gray)
   PAN CAM SELF TEST - HTRS (verify)
   To turn TLM off,
   PAN CAM PWR - OFF

4 OPERATION
   PAN CAM MODE - STBY (verify)
   PAN CAM PWR - PWR (tb-bp 2 sec - gray)
   Verify cam temps in limits (STDN)
   PAN CAM STEREO - STEREO or MONO (per flt pln)
   PAN CAM V/h OVRD - off (ctr)
   PAN CAM MODE - OPR at T START (tb-bp 2 sec-gray)

   *If tb stays bp, go to STBY for 30 sec,*
   * then back to OPR - *
   *If tb-bp persists - out of film or *
   * hdwr failure 
   *PAN CAM MODE - STBY 
   *Consult STDN 

Note: The V/h OVRD sw has 3 settings:
   HI ALT - 57-64NM/1 meter resolution; 55-75NM/
   2 meter res
   off (ctr) - Automatic V/h control
   LO ALT - 53.4-57NM/1 meter res; 49-65NM/
   2 meter res
   (Set to HI or LO only upon direction from
   STDN)
5 TERMINATION
PAN CAM MODE - STBY at T STOP
STDN verify lens stow

After lens stow (STDN),
PAN CAM PWR - OFF

LENS STOW LOGIC (NO COMM):
To insure lens stow,
PAN CAM MODE - STBY (T STOP)
PAN CAM MODE - STBY (30 sec) at
sub-solar pt. (+5°)
PAN CAM PWR - OFF

Note: For stereo mode, pause at
STBY for 30 sec, then turn pwr
off. For mono, pause 45 sec.
This insures camera will cycle
completely.
6 MAPPING CAMERA/LASER ALTIMETER

Exp - Laser Altimeter opr
FOV - 74° sq (cam)
12° half-angle cone (stellar)
Sun avoidance - +37° LOS (non-opr), 4 min max
+82° LOS (opr)
stellar: +25° LOS (opr)
Att - +X fwd (lighted side); +X fwd (dark side)
+ 1/2° of nadir (+ 1/2° of att for obliques), 1/2°db
Dumps - none for 3 hr prior to exp opr
exp off, cover closed

1 STANDBY (SPS MNVRS, LAUNCH, TLI, AND WARMUP)
NONESS BUS - MNA
SM/AC PWR - on (up)
MAP CAM ON - STBY (If ON, pause at OFF 30 sec)
Note: MAP CAM tb may be bp during warmup
MAP CAM IMAGE MTN - OFF (tb-bp ~4 sec-gray)

2 COVER OPEN
LOGIC PWR (2) - DPLY/RETR
MAP CAM/LASER EXP COVERS - OPEN (tb-bp
2 or 3 sec - gray)

3 DEPLOYMENT
Verify cover open
LOGIC PWR (2) - DPLY/RETR
MAP CAM TRACK - EXTEND (tb-bp ~1:20 - gray)

4 OPERATION
LASER ALTM - ON

CAUTION
LASER ALTM MUST NOT BE
OPERATED WITH COVER CLOSED
1-16

MAP CAM ON - STBY (tb-gray)(verify)
MAP CAM IMAGE MTN - ON (tb-bp ~4 sec-gray)
MAP CAM ON - ON at T START

*If tb goes bp, go to STBY*
* and consult STDN *

MAP CAM IMAGE MTN - INCR (mom) (per MSFN)
Note: tb-bp 57-61NM
bp+1 54-57NM
bp+2 <54NM
bp+3 65-125NM
bp+4 61-65NM

5 TERMINATION
MAP CAM ON - OFF (30 sec) - STBY
MAP CAM IMAGE MTN - OFF (tb-bp ~4 sec - gray)
LASER ALTM - OFF

6 RETRACTION
LOGIC PWR (2) - DPLY/RETR
MAP CAM TRACK - RETRACT (tb-bp ~1:20 - gray)

7 COVER CLOSE
Verify steps 5 & 6 complete.
LOGIC PWR (2) - DPLY/RETR
MAP CAM/LASER EXP COVERS - CLOSE
(tb-bp 2 or 3 sec - gray)
7 PAN AND MAP CAMERA FILM CYCLING (24+6 hr)

VERIFY:
- cb SCI EQUIP SEB 1&2 - close (Pnl 5)
- NONESS BUS - MNA
- cb SM SECTOR 1 AC2 (3) - close (Pnl 181)
- MAP CAM IMAGE MTN - OFF

DATA SYS ON - ON
S-BD AUX TV - SCI
SM/AC PWR - on (up)
MAP CAM ON - STBY (tb-gray)
PAN CAM MODE - STBY
PAN CAM PWR - PWR (tb-bp 2 sec - gray)
PAN CAM SELF TEST - HTRS

On STDN cue,
- ACQ STDN, HGA: REACQ, NARROW
- HGA P -40, Y +90
- PCM BIT RATE - HIGH

On STDN cue,
- MAP CAM ON - ON (2 min) - OFF
- PAN CAM SELF TEST - SELF TEST (mom)
  (tb-bp 1 min - gray)
- Wait 10 sec
- PAN CAM PWR - OFF (ctr)

After MAP CAM OFF for 30 sec,
- SM/AC PWR - OFF
- S-BD AUX TV - off (ctr)
- PCM BIT RATE - LOW
8 LASER ALTIMETER

Exp - MC cover open
MC extd (for more than 2 hr opr)
FOV - .02°
Sun avoidance - direct at sun (non-opr)
+10° LOS (opr)
Att - ±2° of nadir, 5° deadband
Dumps - exp off, cover closed

1 COVER OPEN
LOGIC PWR (2) - DPLY/RETR
MAP CAM/LASER EXP COVERS - OPEN
(tb-bp 2 or 3 sec - gray)

CAUTION
Laser Altm must not be operated with cover closed

2 OPERATION
Verify map cam cover open
Extend map cam/laser altm if laser is to be operated longer than 2 hr.
NONESS BUS - MNA
SM/AC PWR - on (up)
LASER ALTM - ON

3 TERMINATION
LASER ALTM - OFF

4 COVER CLOSE
LOGIC PWR (2) - DPLY/RETR
Verify MAP CAM TRACK retracted
MAP CAM/LASER EXP COVERS - CLOSE
(tb-bp 2 or 3 sec - gray)
9 SIM EQUIPMENT BUS LOSS LIST

1  AC BUS 2
   LASER ALTIMETER
   LUNAR SOUNDER
   PAN CAMERA

2  MAIN BUS (A or B)
   LASER ALTIMETER (B)
   LUNAR SOUNDER:
      RADAR (A)
      OPTICAL RECORDER (B)
      MAPPING CAMERA (B)
      PAN CAMERA (A)
   Cover Operation & tb:
      IR RADIOMETER (A)
      MAP CAM/LASER EXP (A)
      UV SPECTROMETER (A)
   Extend & Retract Function & tb:
      LUNAR SOUNDER ANTENNAE:
         HF 1 (A)
         HF 2 (B)
         MAPPING CAMERA (A)

3  LOGIC BUS (A or B)
   SIM Door (A & B)
   Cover Operation & tb:
      IR RADIOMETER (A)
      MAP CAM/LASER EXP (A)
      UV SPECTROMETER (A)
   Extend & Retract Function & tb:
      LUNAR SOUNDER ANTENNAE:
         HF 1 (A)
         HF 2 (B)
         MAPPING CAMERA (A)
4 JETTISON BUS (A or B)
LUNAR SOUNDER ANTENNAE (A & B)
SIM Door (A & B)

5 EXPERIMENT BUS (1, 2 or 3)
IR RADIOMETER (1)
LASER ALTIMETER (1 & 2)
LUNAR SOUNDER (3)
MAPPING CAMERA (2)
PANORAMIC CAMERA (1)
UV SPECTROMETER (3)
SIM BAY ATTITUDE CONTROL
FAILURE MATRIX

<table>
<thead>
<tr>
<th>FAILED AUTO COIL</th>
<th>RHC</th>
<th>PULL CB CONTR/DIRECT</th>
<th>ROT CONTR PWR SWITCH</th>
</tr>
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<tbody>
<tr>
<td>A3 (+ PITCH)</td>
<td>#2</td>
<td>2 - MNB</td>
<td>DIRECT</td>
</tr>
<tr>
<td>B3 (+ YAW)</td>
<td></td>
<td>2 - MNA</td>
<td>2</td>
</tr>
<tr>
<td>C4 (- PITCH)</td>
<td></td>
<td>2 - MNB</td>
<td>MNA/MNB (ROT CONTR PWR NORMAL 2 - OFF)</td>
</tr>
<tr>
<td>D4 (- YAW)</td>
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<td>2 - MNA</td>
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<tr>
<th>FAILED AUTO COIL</th>
<th>RHC</th>
<th>PULL CB CONTR/DIRECT</th>
<th>ROT CONTR PWR SWITCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3 (+ PITCH)</td>
<td>#1</td>
<td>1 - MNA</td>
<td>DIRECT</td>
</tr>
<tr>
<td>B3 (+ YAW)</td>
<td></td>
<td>1 - MNB</td>
<td>1</td>
</tr>
<tr>
<td>C4 (- PITCH)</td>
<td></td>
<td>1 - MNA</td>
<td>MNA/MNB (ROT CONTR PWR NORMAL 1 - OFF)</td>
</tr>
<tr>
<td>D4 (- YAW)</td>
<td></td>
<td>1 - MNB</td>
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</tbody>
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(Configuration for firing a single CSM RCS direct jet when a forward CSM RCS auto coil has failed)
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INSTRUMENTS SCI EQUIP
SEB 1

cb SEB 1 open

1. Note configuration of:
   - IR
   - PAN CAM PWR
   - PAN CAM SELF TEST

2. IR - OFF
   - PAN CAM PWR - OFF
   - PAN CAM SELF TEST - off (ctr)
   - Reset cb SEB 1

3. NO Did cb SEB 1 remain closed?

4. IR - original configuration
   - Yes
   - IR EXP is overloading cb SEB 1
   - IR - OFF
   - Reset cb SEB 1
   - Continue IR EXP

5. SM/AC PWR - OFF (pnl 181)
   - Reset cb SEB 1
   - Did cb SEB 1 remain closed?

6. YES
   - IR EXP is overloading cb SEB 1
   - IR - OFF
   - Reset cb SEB 1

7. PAN CAM SELF TEST - original configuration
   - Did cb SEB 1 remain closed?

8. Pan camera heaters are overloading cb SEB 1.
   - PAN CAM SELF TEST - off (ctr)
   - Reset cb SEB 1

9. Power is lost to:
   - PAN CAM (AC & DC)
   - LASER ALTM (AC)
   - Note: IR EXP and MAP CAM cannot be operated simultaneously
   - To operate IR EXP:
     - IR ops (2.1)
   - To operate MAP CAM:
     - cb SEB 1 - open
     - SM/AC PWR - ON
     - MAP CAM/LASER ALTM ops (6.2),
       (omitting LASER ALTM ops)

10. NO Did cb SEB 1 remain closed?

11. YES
    - Continue PAN CAM EXP

12. PAN CAM PWR - original configuration
    - Did cb SEB 1 remain closed?

13. PAN CAM overloading cb SEB 1
    - PAN CAM PWR - OFF
    - Reset cb SEB 1

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SIM MALFUNCTION PROCEDURES
INSTRUMENTS SCI EQUIP
SEB 2

SIM MALFUNCTION PROCEDURES

1. Note configuration of: MAP CAM ON LASER ALTM
   2. MAP CAM ON - OFF LASER ALTM - OFF Reset cb SEB 2
      Did cb SEB 2 remain closed?

4. cb SEB 2 or SM/AC power relay K11 failed or SCI EQUIP Bus 2 shorted, Power is lost to: MAP CAM LASER ALTM

3. Verify MAP CAM COVER open LASER ALTM - original configuration
   Did cb SEB 2 remain closed?

5. Laser Exp is overloading cb SEB 2, LASER ALTM - OFF Reset cb SEB 2
   6. Continue LASER ALTM EXP

7. MAP CAM ON - original configuration
   Did cb SEB 2 remain closed?

9. Mapping camera is overloading cb SEB 2, MAP CAM - OFF Reset cb SEB 2
   8. Continue MAP CAM EXP
INSTRUMENTS SCI EQUIP
HATCH

1. cb HATCH open
   Is LUNAR SOUNDER EXP operating in mode other than HTRS ONLY?
   YES → See LUNAR SOUNDER EXP MALFUNCTION PROCEDURES
   NO → Note configuration of:
         UV SPECT
         LS RCDR

2. UV SPECT - OFF
   LS RCDR - OFF
   Reset cb HATCH
   Did cb HATCH remain closed?
   YES → LS RCDR - HTRS
   NO → LUNAR SOUNDER failed in HTRS ONLY mode.
       LS RCDR - OFF
       Reset cb HATCH
       Attempt to operate LUNAR SOUNDER EXP in data collecting modes according to Flight Plan.

3. SCI INST - OFF (pnl 227)
   Reset cb HATCH
   Did cb HATCH remain closed?
   YES → Power is lost to pnl 227 UTILITY OUTLET
   NO → Continue UV SPECT EXP.

4. cb HATCH failed open or power (VNE) is shorted.
   Power is lost to:
   Pnl 227 UTILITY OUTLET
   HEC & DAC
   UV SPECT EXP
   LUNAR SOUNDER EXP

5. Power is lost to pnl 227 UTILITY OUTLET
   UV SPECT - original configuration
   Did cb HATCH remain closed?
   YES → Continue UV SPECT EXP.
   NO → Power is lost to UV SPECT EXP.

6. Does UV SPECT EXP remain closed according to Flight Plan?
   YES → Continue UV SPECT EXP.
   NO → Power is lost to UV SPECT EXP.

7. Power is lost to UV SPECT EXP.
   UV SPECT - OFF
   Reset cb HATCH

8. Did cb HATCH remain closed?
   YES → Continue UV SPECT EXP.
LUNAR SOUNDER EXP MALFUNCTION PROCEDURES

1. Verify:
   - UV SPECT - OFF
   - SCl INST - OFF (pn 227)

2. Note operating mode and configuration of LUNAR SOUNDER switches:
   - RCDR
   - RADAR
   - LS OPERATE

3. RCDR - OFF
   - RADAR - OFF
   - LS OPERATE - STBY
   Reset cb HATCH
   Did cb HATCH remain closed?

4. cb HATCH failed open or power (VNE2) is shorted.
   Power is lost to:
   - Pnl 227 UTILITY OUTLET
     (TM capability lost to HEC & DAC)
   - UV SPECT EXP
   - LUNAR SOUNDER EXP

5. RCDR - HTRS
   Did cb HATCH remain closed?

6. Power is lost to LUNAR SOUNDER heaters
   - RCDR - OFF
   Reset cb HATCH

7. RADAR - ON
   Did cb HATCH remain closed?

8. Continue LUNAR SOUNDER heater operation per Flight Plan

9. Reconfigure LUNAR SOUNDER to original operating mode (see HF or VHF activation 4.5 or 4.9); note warm-up times.
   Did cb HATCH remain closed when RCDR - ON or LS OPERATE - OPERATE?

10. Power is lost to RADAR receiver. Stop LUNAR SOUNDER operation.
    - RCDR - OFF
    - RADAR - OFF
    Reset cb HATCH
    Consult MCC before retracting antennae

11. Power lost to LUNAR SOUNDER XMTRS or RCDR.
    - RCDR - OFF
    - RADAR - OFF
    Reset cb HATCH

12. Continue LUNAR SOUNDER operation per Flight Plan
HF ANTENNA DEPLOYMENT
MALFUNCTION PROCEDURE

1. tb not bp within 12 sec
   (tb remains gray)

   1. **HF ANTENNA - OFF**
   2. Verify LOGIC POWER (pnl 181):
      LOGIC POWER MNA & MNB cb - closed
      LOGIC POWER (2) - DPLY/RETR

   Was any switch improperly positioned?

   3. **HF ANTENNA - RETRACT**

   Is tb bp?

   4. **HF ANTENNA - EXTEND (2 min) - OFF**

   Is full extension of antenna indicated by telemetry (motor current or extend/retract bits)?
   (Note: Full extension of HF ANT 2 may be verified from window 1)

   YES
   NO (tb failure)

   5. Was antenna motion indicated by telemetry (motor current or extend/retract bits)?

   6. **ANTENNA FAILED, CONSULT MCC**

   7. Perform subsequent deployments based on telemetry measurements and in contact with MCC

   8. **Allow motor to cool for 3 min**
   **Perform 3 times:**
   ANTENNA - RETRACT (10 sec)
   ANTENNA - EXTEND (15 sec)
   Wait 3 min for cooling
   ANTENNA - EXTEND (2 min)

   Was antenna motion indicated by telemetry?
HF ANTENNA RETRACTION MALFUNCTION PROCEDURE

1. tb not bp within 12 sec (tb remains gray)

2. HF ANTENNA - RETRACT

3. Was any switch improperly positioned?

4. HF ANTENNA - EXTEND (15 sec) - OFF

5. Perform 3 times:
   - HF ANTENNA - RETRACT (15 sec)
   - HF ANTENNA - EXTEND (10 sec)
   - Wait 1 min for cooling
   - HF ANTENNA - RETRACT (2 min)

6. Perform this and subsequent deployment/retractions based on telemetry (motor current and extend/retract bits)

7. JETT antenna before next SPS burn

8. Is completely retracted position verified by telemetry (MCC)?

9. JETT antenna if not retracted sufficiently for SPS burn (MCC)

10. Safe for SPS burn
UV SPECTROMETER ORIENTATION

DATE 9/29/72
1 ALFMED (GET 68)

Review ALFMED Experiment Notes
Install window shades
All don LtWt Headsets
Unstow blindfolds (A8, Sec 2)
Unstow ALFMED (A8, Sec 1)
Remove cover plate and leave in A8, Sec 1
Unstow vacuum cleaner cable (A2, Sec 3)
PNL 201 AC UTIL PWR - OFF (verify)
ALFMED PWR sw - OFF (verify)
Conn vac cleaner cable to ALFMED &
AC util outlet
PNL 201 AC UTIL PWR - on (up)
All to couches (ALFMED in ctr.)
ALFMED CLUTCH - OPERATE
Don ALFMED (with blindfold)
Photograph CMP with ALFMED on (bottom & side) to
see position on head & in S/C
CM/NK/55/CIN(Use camr mtr, focus)
  Record MAG, FR #
CDR don blindfold
LMP prepare to copy CMP & CDR comments
Report start of experiment and crew location in CM
ALFMED PWR - ON (Give verbal "MARK")
At end of experiment (after 60 min):
Doff blindfolds
ALFMED PWR sw - OFF (Give verbal "MARK")
Photograph CMP with ALFMED on (bottom & side) to 
see position on head & in S/C
CM/NK/55/CIN (Use Camr mtr, focus)
Record MAG, FR # __________
Doff ALFMED
*If motor did not shut*
*off automatically at *
*the end of 60 min, *
*wait 5 min before *
*proceeding *
ALFMED CLUTCH - Mid position (rap on lower frame)
Listen for moving frame
ALFMED CLUTCH - OPERATE, then STOW
PNL 201 AC UTIL PWR - OFF
Disconnect vacuum cleaner cable from ALFMED
Install cover plate on ALFMED & stow (A8, Sec 1)
Stow blindfolds (A8, Sec 2)
Discon & stow vac cleaner cable (A2, Sec 3)
Stow window shades

ALFMED EXPERIMENT NOTES

PRIORITY OF REPORTING (formal sessions)
Rept all light flashes to MSFN (VOX mode)
1 Time (mark)
2 Eye (left or right)
3 Type of event (streak, star, cloud, etc)
4 Location in visual field
5 Remarks (color, brightness, apparent motion of streaks)
GENERAL QUESTIONS (all sessions)

1. Is drk adapt reqd? (ΔT to first flash)

2. Any subtle halos, glows or clouds (espec in periphery) alone or with other events?

3. Any apparent propogation of streaks? (Seem to begin at one end & propogate like an O'scope trace?) Try to est spd & length (in fraction of visual field). How sharp or diffuse are streaks?

4. If there is a coincidence bet two observers, could 1st MARK also be used for 2nd obsvr?

5. Any marked difference (freq or other) at different mission times? Try to note: Phase of mission (EO, TLC, LO, TEC), Loc & att of CM, Physical cond (fatigue, hunger, thirst, etc) Note diff in freq (etc) between couch & LEB. Up Sun., Dn Sun.

6. During lunar orbit, is there diff depending on orientation WRT lunar surface & SM? Is there a diff from orbit to orbit?
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2 HEAT FLOW AND CONVECTION (HFC)

PREPARATION

Unstow HFC (A7)
Open lids HFC and lock and mount on PNL 122 using bungee straps (LH LEB with lineal cell towards +X)
Verify flood light ON
Install all window shades
Verify PNL 16 UTIL PWR - OFF
Verify PNL 100 UTIL PWR - OFF
Verify HFC EXP PWR - OFF
Position HFC light
Attach HFC light cable
Connect HFC (DAC) power cable to HFC and PNL 100
Configure Camera
CM/DAC/10/CIN/(T1.8,1/60,1') 1 fps
Expand camera mount and mount camera
Connect DAC power cable to PNL 16 and camera

PNL 100 UTIL PWR - ON
PNL 16 UTIL PWR - ON

PCM BIT RATE - HIGH

Wind watch and record time vs GET
WATCH __ : __ : __ :
GET __ : __ : __ (USE CMC)
Mount watch to lineal unit support bracket (orange color code)

EXP/HEAT SELECT - LIGHT 3
EXP PWR - ON
(light ON)

NOTE - HFC should be kept motionless during all tests

9/29/72
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2-5

RADIAL & LINEAL TEST #1

0:00 Reset stop watch and start
START DAC
1:00 EXP/HEAT SELECT - RADIAL & LINEAL
11:00 EXP/HEAT SELECT - LIGHT 5
16:00 END OF TEST
Proceed to next test

FLOW PATTERN HI HEAT TEST

1 FLOW - OPEN (CCW - 4 Turns)
2 Unlock and open FLOW PATT cover
   (LK, CCW - 1/4 Turn)
3 Rotate FLUID INJECT (CW - 4 Turns until
   fluid fills bottom retainer lip and
   is level with lip over entire pan)
   NOTE - If fluid is jarred out of
   pan, open cover, wipe clean
   with tissues and repeat
   steps 1, 2, and 3.

0:00 Reset stop watch and start
2:00 EXP/HEAT SELECT FLOW PATT - HI
17:00 EXP/HEAT SELECT - LIGHT 4
19:00 Rotate FLUID INJECT (CCW - 4 Turns)
Stuff two tissues into FLOW PATT
pan
Close cover secure
FLOW - CLOSE (cw - 4 Turns)
EXP PWR - OFF
DRC - OFF
Let HFC unit cool down
Start PTC spin up wait 1 hr
until next test
RADIAL & LINEAL TEST #2

0:00 Reset stop watch and start
DAC - ON
1:00 EXP PWR - ON
   EXP/HEAT SELECT - LIN + RAD
11:00 EXP/HEAT SELECT - LIGHT 4
   (cool down)
16:00 END OF TEST
   Proceed to next test

FLOW PATTERN LOW HEAT TEST

Unlock and open FLOW PATT LID
Remove tissue, wipe pan to remove
residual fluid
FLOW - OPEN (CCW - 4 Turns)
Rotate FLUID INJECT - CW, slowly
8 revs exactly, after fluid sighted

0:00 Reset stop watch and start
2:00 EXP/HEAT SELECT - FLOW PATT - LO
17:00 EXP/HEAT SELECT - LIGHT 4
   Rotate FLUID INJECT, CCW to stop
   (about 8 Turns)
   Stuff two tissues in FLOW PATT
   pan, close cover and lock
DAC - OFF
Record GET
EXP PWR - OFF
PNL 16 UTIL PWR - OFF
PNL 100 UTIL PWR - OFF
Remove liquid crystal sample
   from HFC cover
Tape patch face down to DAC MAG
Disassemble and stow equipment
Configure camera

Note: Take protection frames before mounting camera in window

Tape flood light
CM4/EL/80/VHBW - BRKT(f2.8,1/500,INF)
Remote control cable, PCM cable
Record MAG ____, FR # _____
Cycle 1 FR - Cover lens
Shutter to 1/60
Mount in window
Prep penlights (2)
Verify shutter settings
Dim interior lights
3 SEQUENCE #1 - Timing accuracy reqd ~2 sec

0:00 MISSION TIMER, RESET/START
T START

(SSH - 5 MIN)

PCM BIT RATE - HIGH (verify)

EL
4:30 CMC MODE - FREE
5:10 1/60 - 1 FR
   HOLD DOWN TRIGGER
5:20 1/30 - 1 FR
   Skip one stop
5:30 1/8 - 1 FR
   Skip one stop
5:40 1/2 - 1 FR
5:50 1 sec - 1 FR
   Shutter to B
6:00 4 sec - 1 FR
6:15 10 sec - 1 FR
   CMC MODE - AUTO

1/500 - 1 FR (cover lens)

4 Lights up
Record FR #

NOTES
4 SOLAR CORONA (SUNRISE)
   (EL-9 FR REQ) (DARKNESS REQ) (GET 137,232)

1 P2O OPT 5 (+X FORWARD, ORB RATE)

2 Configure camera
   CM4/EL/80/VHBW - BRKT(f2.8,1/500,INF)
   Remote control cable, PCM cable
   Record MAG __, FR #__
   Cycle 1 FR __
   Set to B - Install
   Verify shutter settings
   Prep penlights (2)
   Dim interior lights

DATE: 9/29/72
3 SEQUENCE #1 - Timing accuracy reqd ~2 sec

0:00 MISSION TIMER, RESET/START

T START: ----:----:----

(SR-7 MIN) ----:----:----

PCM BIT RATE - HIGH (verify)

4:30 CMC MODE - FREE

HOLD DOWN TRIGGER

5:45 10 sec - 1 FR
6:00 4 sec - 1 FR
6:10 Shutter to 1 sec - 1 FR
6:20 1/2 - 1 FR

Skip one stop
6:30 1/8 - 1 FR

Skip one stop
6:40 1/30 - 1 FR
6:50 1/60 - 1 FR

CMC MODE - AUTO

NOTE: Remove camera for protection frames

1/500 - 1 FR (Cover lens)

4 Lights up

Record FR # _________

NOTES
X
2-10a

CMP SOLAR CORONA SKETCH PAD

SUNRISE, GET _______

SUNSET, GET _______

DATE 9/29/72
SUNRISE, GET ________

SUNSET, GET ________

DATE 9/29/72
X
2-10c

**CDR SOLAR CORONA SKETCH PAD**

SUNRISE, GET ________

SUNSET, GET ________

DATE 9/29/72
SUNRISE, GET __________

X
2-10d

SUNSET, GET __________

DATE
9/29/72
LMP SOLAR CORONA SKETCH PAD

SUNRISE, GET ________

SUNSET, GET ________

DATE 9/29/72
X
2-10f
SUNRISE, GET ________

SUNSET, GET ________

DATE
9/29/72
5 ZODIACAL LIGHT (POL)
(24 FR REQ) (GET 185)
(+X FORWARD, ORB RATE)
(P20 OPT 2 PER FP)

1 Configure camera
CM4/NK/55/VHBW-BRKT(30 DEG) POL FIL
(f1.2,1/1000,INF)
Record MAG ______, FR # ______
Prep penlights
Dim interior lights
Tape flood lights

2 ZODIACAL SEQ

Timing accuracy reqd $\sim$2 sec
Start pitch rate

MIN SEC
0:00 MISSION TIMER, RESET/START
T START ________________________
_CYCLE 1 FR
Change shutter to T
For each shutter speed
Take 2 FR - one with POL FIL -0 DEG,
One with POL FIL -90 DEG
1:00 90 sec - 2 FR
5:00 60 sec - 2 FR
8:00 30 sec - 2 FR
10:00 20 sec - 2 FR
11:30 10 sec - 2 FR
13:00 5 sec - 2 FR
13:30 3 sec - 2 FR
13:50 Shutter to 1 - 2 FR
Skip one stop
14:10 Shutter to 1/4 - 2 FR
Skip one stop
14:30 Shutter to 1/15 - 2 FR
Skip one stop
14:50 Shutter to 1/60 - 2 FR
Shutter to 1/1000 - 1 FR (Cover lens)
Lights up
3 Record FR #
Stow camera

NOTES

9/29/72
6 ZODIACAL LIGHT RED/BLUE
(13 FR REQ) (GET 133 RED, 163 BLUE)
(+X FORWARD, ORB RATE)
(P20 OPT 5 PER FP)

1 Configure camera
First run use red filter
Second run use blue filter
CM4/NK/55/VHWW-BRKT (0 DEG)
(f1.2, 1/1000, INF)
Record MAG ____, FR # _____
Enable jets C3, D3
Disable jets A3, B3
Prep penlights
Dim interior lights
Tape flood lights
2 ZODIACAL SEQ

Timing accuracy reqd ~2 sec

MIN SEC
0:00 MISSION TIMER, RESET/START
T START

(SR-T5 MIN)
CYCLE 1 FR
Change shutter to T
V22 N79, +005.00
1:00 90 sec - 1 FR
5:00 60 sec - 1 FR
8:00 60 sec - 1 FR
10:00 40 sec - 1 FR
11:30 20 sec - 1 FR
13:00 10 sec - 1 FR
13:30 6 sec - 1 FR
13:50 Shutter to B, 2 sec - 1 FR
14:10 Shutter to 1/2 - 1 FR
Skip one stop
14:30 Shutter to 1/8 - 1 FR
Skip one stop
14:50 Shutter to 1/30 - 1 FR
Shutter to 1/1000 - 1 FR (Cover lens)
Lights up
CMC - FREE
V22 N79, +000.50
Enable jets A3, B3
Disable jets C3, D3
CMC - AUTO

3 Record FR # _________
Stow camera
7 GALACTIC PHOTO (GET )
(4 FR REQ)

1 ATT MNVR REQ - GALACTIC PT #1
Check star pattern
F 50 18
V62

2 Configure camera
Install camera shield with camera
in the 30 DEG BRKT position
CM4/NK/55/VHBW-BRKT(30 DEG)(f1.2,1/1000,INF)
Record MAG, FR #____
Tape flood lights
Dim interior lights

3 Damp rates - wait 5 MIN
DESI RABLE < .05 DEG/sec
ATT ERROR < 5 DEG

4 CMC MODE - FREE (DOUBLE UMBRA REQ)
Cycle 1 FR
Shutter to T
Use kitchen timer
5 MIN - 1 FR
CMC MODE - AUTO
MNVR to GALACTIC PT ATT #2 R_____P_______Y_____
Check star pattern
Damp rates - wait 3 MIN
CMC MODE - FREE
5 MIN - 1 FR
Shutter to 1/1000 - 1 FR
CMC MODE - AUTO
Lights up
V61

5 Record FR #____

NOTES
8 L-4 LIBRATION POINT PHOTO (GET)

1 ATT MNVR REQ
   Leave F 50 18.
   V 62 E
   Check star pattern

2 Configure camera
   Install camera shield with camera
   in the 30 DEG BRKT position
   CM4/NK/55/VHBN - BRKT (30 DEG)(f1.2,1/1000,INF)
   Record MAG, FR # ________
   Dim interior lights
   Tape flood lights

3 Damp rates - wait 5 MIN
   DESIRABLE < .03 DEG/sec
   ATT ERROR < 5 DEG
   Check TARGET CHART

4 CMC MODE - FREE (DARKNESS REQ)
   Cycle 1 FR
   Shutter to T
   1 MIN - 1 FR ________
   3 MIN - 1 FR ________
   CMC MODE - AUTO
   Trim ATT
   Damp rates - wait 3 MIN
   CMC MODE - FREE
   1 MIN - 1 FR ________
   3 MIN - 1 FR ________
   Shutter to 1/1000 - 1 FR ________
   CMC MODE - AUTO
   LIGHTS up

5 Record FR # ________
   V 61 E ________
9 LUNAR SURFACE IN EARTHSHINE (GET 121) (40 FR REQ)

1 Configure camera
   CM5/NK/55/VHBW (f1.2, 1/8, INF)
   Record MAG, FR # _______
   Install window shades except CM5
   Dim interior lights

2 Point camera SOUTH window 5

   NOTE: Position long axis of frame
   NORTH-SOUTH

Timing accuracy reqd ±5 sec
0:00 MISSION TIMER: RESET/START (T START)
   T START : : (SS)
2:00 Cycle 1 FR
2:30 Cycle 1 FR
3:00 Cycle 1 FR
3:30 Cycle 1 FR
4:00 Cycle 1 FR
4:30 Cycle 1 FR
5:00 Cycle 1 FR
5:30 Cycle 1 FR
6:00 Cycle 1 FR
6:30 Cycle 1 FR
7:00 Cycle 1 FR
7:30 Cycle 1 FR
8:00 Cycle 1 FR
8:30 Cycle 1 FR
9:00 Cycle 1 FR
9:30 Cycle 1 FR
10:00 Cycle 1 FR
10:30 Cycle 1 FR
Point camera NORTH window 3

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<tr>
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</tr>
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</table>

3 Lights up
Record FR # _______

NOTES
10 COMET PHOTOS

1 Configure camera
CM/DAC/SXT/VHBW (1/1000) 24 fps
Record MAG, % ______
UTILITY PWR - ON

2 V49 MNVR to COMET ATT

3 G&N PWR (AC) - OFF (PNL 5)

4 P52 (No marks) N70 (00000)
   N88 { } ______
   ______

Dim LEB lights

5 Verify target through SXT
Mount DAC on SXT
NOTE: Green light on when shutter closes
Dim interior lights
DAC - ON 24 fps - 2 sec
Change to TIME and 1/60
   60 sec - 1 FR
   20 sec - 1 FR
   5 sec - 1 FR
Change to 24 fps and 1/1000
Run DAC for 2 sec, lights up

6 Record MAG and % ______
Remove and stow DAC
G&N PWR - AC1 or AC2 (PNL 5)
Lights up
BIOMEDICAL URINE SAMPLING SYSTEM (BUSS)

VOIDING
Unstow BUSS from stowage package (UI)
Insert BUSS into cover (shut off valve handle exposed), snap cover
Don roll-on cuff at receiver end of container
Open shut off valve
Void urine
Manipulate residual urine from cuff into receiver
Close shut off valve
Doff cuff
Temp stow BUSS

SAMPLE COLLECTING
Remove cover from BUSS
Agitate urine for approx one min (until tracer shows thorough mix)
Detach sample container from BUSS
Record GET on sample container
Assemble restraint over sample container
Connect sample container to BUSS with mating halves
Fill sample container (until tight against restraint) by squeezing BUSS (avoid gas bubbles in sample)
Disconnect sample container

STOWING AND DUMPING
Remove sample container from restraint
Stow sample container in fecal transfer bag
Temp stow restraint
Dump urine from BUSS through dump system per CSM Systems Checklist, S/1-11
Disconnect empty BUSS, discard in TSB
1 CM EVA PREP

CABIN PREP FOR EVA
CDR and LMP don biomed harness and verify operation
Stow Optics
Pnl 379 Prim accum fill vlv ON until 50-55%, then OFF
Temp stow A9 rock bag between PGA bag and A9 container
Install EVA stabilizer strut
Unstow 2 CM EVA and 2 EMER cue cards (R2), add turnover tape and attach to MDC
Stow MDC ingress bar
Verify ORDEAL stowed
Stow COAS

Unstow EVA umbilical bag from side of A7, attach 4 snaps to top of A4, A5 & A6
Discon inboard hooks on A2 Decon bag, attach to handhold on L3
Discon inboard hooks on A7 Decon bag, attach to R9 handle
Stow LEVA bags (2) in tunnel using short bungees (Remove tunnel TSB, if req'd)
Retrieve JETT bag, secure draw string, tape (VW pouch)
Temp stow JETT bag
Verify DAC mag FF in F-2
Unstow from A8:
Sect-1 1-interconnect - stow in CMP TSB (top pkt)
Sect-1 EMU maint kit, stow in CMP TSB (top pkt)
Sect-2 CWG's (3), stow in CMP TSB
Sect-2 Biomed harness (3), stow in CMP TSB, or verify unstowed and/or donned
Comm carriers (3), stow in CMP TSB (top pkt)
Sect-3 Tool kit - verify jack screws fully opened inside, snap 2 snaps to LH girth ring
Close A8
Unstow MDC guards (3) and TV pole from side of A8
Stow TV pole on RH LEB
Install MDC guards

Unstow From A2
- Sect-3 EVA bag, snap top, bot & side to center LEB
- Sect-3 CMP EV gloves - stow CMP TSB (top pkt)
- Sect-3 heel clips and vac cleaner bag - stow in A7 after removing OPS
- Sect-1 Entry tiedown ropes and headrest pads stow in A7
- Sect-1 Lunar Sounder cassette bag - stow in EVA bag
- Sect-1 FCS - stow in LH TSB
- Sect-2 Tissue dispenser - stow in LH TSB, top pkt
- Sect-2 Pressure Gage - Place in EVA bag (Wrist Tether pouch)

Close A2

Stow A9 rock bag in A7
Close A7

Perform OPS Checkout per decal
- OPS press 5380-6380
- Hose locked
- O2 vlv - Open, press 3.4-4.0
- O2 vlv - Close (Reg press decrease)
- Snap OPS thermal cover on LEB above B3

Pnl 1 - TRANS CONT PWR - OFF (verify)
- ROT CONTR PWR NORMAL (2) - OFF
- ROT CONTR PWR DIRECT (2) - OFF

Verify THC and both RHC's locked

Stow RHC No. 1 in F2

Remove THC, secure behind Decon bag straps on L3
Install RHC No. 2 on THC mount, route under couch
Pnl 1 - ROT CONTR PWR NORMAL #2 - AC/DC
Lower handcontroller struts and lock the
handcontroller mount push locks
Install meter covers (4 EVA Bag)
Add alignment mark on counterbalance
Disconnect Hatch counterbalance Lock Pin
(Tool B, Turn CCW to STOP)

TV AND DAC PREP
Unstow from Fl
DAC, install mag FF (F2)
Power cable
Close Fl
Unstow 10mm lens (B3), attach to DAC

Discon inboard hook on A1 DECON bag and attach
to Y-Y strut
Unstow from A1
Sect-2 TV camera
Sect-2 Power cable, beside camera
Sect-2 Monitor cable, under camera
Sect-2 TV monitor
Sect-3 l Pkg towels, stow in CDR TSB, top pkt
Close A1
Attach cameras to pole (TV - LH dovetail)
Pnl 3 - S-BD AUX TV - SCI
Connect cables to cameras:
TV power cable P20 to J20 on camera
TV monitor cable P10 to J10 on camera
16mm power cable
Route wiring along pole
Tape cables together

DAC settings (T8,1/250,3) 6 fps, tape settings
TV settings:
Focus - 4
Zoom - 25
Aperture - 22
Tape settings with removable strip
TV camera transmit/standby sw - XMIT (up)
TV camera auto light control sw - PEAK (dwn)
Stow TV pole assembly top of EVA stabilizer strut
Pnl 15 - UTILITY PWR - OFF
Route DAC power outboard of strut
Connect DAC power to receptacle on Pnl 15
Pnl 15 - UTILITY PWR - POWER (verify DAC operation)
Pnl 15 - UTILITY PWR - OFF

Route TV power/COAX outboard of strut and connect to receptacles in tunnel. Route cable along tunnel handstraps and across MDC, tape (do not attach to MDC guard)
Secure wires to TV brkt with spring bungee
Connect cable to TV monitor (P30 to J30 on monitor)

EVA EQUIPMENT PREP
Unstow IV crewman tether from EVA bag - Conn to fitting on Pnl 301,
Route along LMP umb,
Snap strap at suit end
Shorten LMP comm cable by looping the cable in the tunnel area
Pnl 10 - POWER - OFF
SUIT POWER - OFF
AUDIO CONTROL - NORM
Pnl 604 - SUIT PRESS ALARM - OFF (verify)
Remove all caps from Pnl 603

Unsnap CMP comm cable from 02 umbilical
Route outboard of strut and wires and connect CCU head to pnl 603
Secure cable to TV bracket and top of strut using 2 straps - (R5)
Position TV monitor, tape as required

Disconnect PGA bag from couch (4 places)
Remove center couch
Close and lock marmon clamps
Stow couch under LMP couch using 2 straps (R5)
3-5
Open EVA umbilical bag
Unsnap top strap and remove spacecraft end of EVA umb all the way to the 2nd tiedown strap (unsnap 2nd tiedown strap)
Pnl 603 - EVA STA O2 - OFF (verify)
Attach EV umbilical to Pnl 603 - (route over couch beam and under wires) O2/lock
ELEC/lock (Remove Protective Cap)
Umb tether to couch ring/lock, install pin
SCU - open, bleed system, SCU - close
Unstow press gage from EVA bag, (Wrist tether pouch)
Remove Pnl 603 QD and connect gage
Tape flashlight to pnl 603 guard
Stow tape in VW pouch
Unstow from LH TSB, top pkt
PURGE VLV - stow in EVA bag, PURGE VLV pouch
Waist Tethers - 2
Unstow Waist Tether (from EVA bag)
Extend to max length
Attach tethers to MDC guards (1 LH - 2 RH)
(large hooks outboard)
Lock small hooks only
Unstow CDR LEVA, leave EV gloves in LEVA bag - close bag
Unstow LMP LEVA and EV gloves
Stow LMP EV gloves in LH TSB, top pkt
Close LEVA bag
Restow LEVA bags in tunnel
Unstow CDR helmet and IV gloves
Stow HSB in CDR TSB
Place accessory bag in CDR TSB, top pkt
Place CDR IV gloves in CDR TSB, top pkt
Unstow CMP helmet (HSB RH LEB), restow CMP HSB with IV gloves on RH LEB
Verify all visors and shades on CMP LEVA operate
Install LEVA on CMP helmet (or don separately)
Unstow LMP helmet and restow HSB
Unstow antifog wet wipes (3) - EMU maintenance
kit (CMP TSB, top pkt)
Wet wipe 3 helmets, inside, straight line motion
Wipe dry with tissue (LH TSB, top pkt)

Stow helmets and LEVA's under CDR couch

Pn1 278 - MAP CAM/LASER EXP COVER - CLOSE (verify)
  IR EXP COVER - CLOSE
  UV EXP COVER - CLOSE

Pn1 230 - MAP CAM ON - OFF
  LS RCDR - OFF
  IR - OFF
  PAN CAM SELF TEST - off (ctr)
  UV SPECT - OFF
  DATA SYS ON - OFF

Pn1 181 - LOGIC PWR (2) - OFF
  SM/AC PWR - OFF
  cb SM SECTOR 1 AC 2 (3) - open

Pn1 5 - cb INST SCI EQUIP SEB (2) - open

PGA DONNING
Remove PGA's from bag, disconnect PGA bag
Verify BUSS's covers installed and snapped
Stow BUSS's in PGA bag and place under LMP couch

CMP PGA donning:
  FCS - CMP TSB
  CGW - CMP TSB
  Biomed harness - on crewman/CMP TSB
  UCTA - inside PGA
  Comm carrier - CMP TSB, Top Pkt (don later)
  Conn 02 hoses to LH side R/R, B/B
  PGA Diverter vlv - as desired
  Pn1 302 - Suit Flow - full flow (If reqd)
  Move scissors to PGA EVA pocket
LMP PGA donning:
FCS - inside PGA
CWG - CMP TSB
Biomed harness - on crewman/CMP TSB
UCTA - inside PGA
LCG plug - installed (spare in EVA bag)
Gas connector plugs installed
Don comm carrier - CMP TSB (Top Pkt)

Pnl 6 - POWER - OFF
SUIT POWER - OFF
AUDIO CONTROL - NORM

Conn 02 hoses blue to red for cooling
Conn comm
Pnl 6 - POWER - AUDIO
SUIT POWER - on (up)
Pnl 300 - Suit Flow - full flow (If reqd)
Conn IV tether to RH side/Lock, install pin

V49 MNVR to EVA Att (310,356,009)
HGA P +43, Y +262

CDR PGA donning:
FCS - inside PGA
CWG - CMP TSB
Biomed harness - on crewman/CMP TSB
UCTA - inside PGA
LCG plug - installed (spare in EVA bag)
Gas connector plugs installed
Comm carrier - CMP TSB (don later)

Pnl 9 - POWER - OFF
SUIT POWER - OFF
AUDIO CONTROL - NORM

Conn 02 hoses blue to red for cooling
Conn comm
Pnl 301 - Suit Flow - full flow (If reqd)

All verify PGA zippers locked
CMP verify cap off PGA relief vlv
CDR, LMP - cap PGA relief vlv
PRESS GAGE STATIC CHECK

Verify SCU - CLOSED
Pnl 2 - CRYO PRESS IND - SRG/3
Pnl 603 - EVA STA 02 - ON
Verify EVA STA 02 gage reads approx same as
surge tank press (approx 900 psig)
SCU - OPEN
Verify flow and purge umbilical
Pnl 603 - EVA STA 02 - OFF

Remove PGA plugs and stow in EVA bag, purge
vlv pouch
Remove waist belt stowage strap from umbilical
- stow in EVA bag
Connect EVA umbilical elec and O2 to CMP PGA
RH blue and lock
Connect waist belt and lock (buckle LH side)
Verify belt is under scissor pocket
CDR/CMP don comm carriers - CMP TSB, Top Pkt

COMM CHECK

Pnl 9 - POWER - AUDIO
SUIT POWER - on (up)

Pnl 10 - POWER - AUDIO
SUIT POWER - on (up)
MODE - VOX
VOX SENS TW (as reqd, ~7)
PAD COMM - OFF
S-BD - T/R
AUDIO CONT - NORM
INTERCOM - T/R
VHF AM - OFF

Pnl 3 - S-BD AUX TAPE - off (ctr) (verify)
Pnl 3 - S-BD AUX TV - TV
TV MONITOR PWR - ON

Perform comm check with crew & Hou
Pnl 604 - Suit Press Alarm SW - ON/OFF, verify-tone
Pnl 3 - S-BD AUX TV - off (ctr)
SYSTEMS PREP FOR DEPRESS

Pnl 325 - CABIN PRESS RELIEF vlv (2) - NORMAL
Pnl 326 - REPRESS PKG vlv - ON
Pnl 326 - verify SURGE TK vlv - ON
Pnl 351 - CABIN REPRESS vlv - OFF (verify)
Pnl 600 - EMER 02 vlv - CLOSED (verify)
Pnl 601 - verify REPRESS 02 vlv - CLOSED
Pnl 602 - Verify REPRESS 02 PRESS - 865-935 psi
Pnl 2 - SURGE TANK PRESS - 865-935 psi
Pnl 2 - CABIN FANS - OFF

After mnvr,
V48 (10101)(10011)
Configure AUTO RCS SEL:
A1,A2,B1,D1,B2,D2,A3,A4,B3,B4 - OFF
C1,C2,C3,C4,D3,D4 - MNA
cb A/C ROLL, PITCH & YAW MNB (3) - open
O2 heaters 1,2, & 3 (3) - AUTO
MAN ATT (3) - RATE CMD
LIMIT CYCLE - on (up)
ATT DB - MIN
RATE - LOW
SC CONT - CMC/AUTO
BMAG MODE (3) - RATE 2

*IF SM RCS THRUSTER FAILED ON:
  * SC CONT - SCS
  * AUTO RCS (affected jet) - OFF
  * (odd jet gives + rotation)
  * Damp rates with RHC
  *
  * IF CONDITION PERSISTS:
  * SM RCS PRPLNT (QUADS A&B) - CLOSE
  * ROT CONTR PWR DIRECT #2 - MNA/MNB
  * Damp rate with RHC
CMP EVA EQUIP DONNING

Unstow PCV - EVA bag, (Press vlv pouch)
Connect PCV to PGA RH red connector, lock
PCV - on, turn left (CCW)
Unstow Wrist Tether (Wrist Tether pouch) - Attach
to MDC guard or don, right arm
Discon red ECS 02 hose
Unstow purge vlv (EVA bag, purge vlv pouch)
SET LO (CW), lock and install on PGA

Pnl 302 - Suit Flow - OFF
Disconnect CMP ECS hoses, route around CDR X-X foot-
strut and install interconnect (CMP TSB, top pkt)

Pnl 603 - EVA STA 02 - ON, verify flow

NOTE: Cabin press increases from CMP flow - when
cabin press increases to 5.6 psia, open side
hatch dump valve to decrease pressure to 5.0
psia and close dump valve

OPS DONNING

Verify OPS reg press < 2.5 psid
Unstow OPS 02 hose and actuator
Snap all flaps

Unstow from EVA bag
OPS straps (4), attach with letters to OPS
(top straps - letters face out, bottom
straps - letters face up)
OPS adapter brkt, attach adapter to PGA

Don OPS, connect lower straps to PGA D-Ring and
upper straps to adapter brkt
Connect OPS 02 actuator to brkt
Conn OPS 02 hose to PGA, route under OPS and
under left arm (LMP assist)
Unstow CDR & LMP ECS hoses from CM stowage straps
CDR/LMP - Connect ECS hoses to inboard connectors (R/R,B/B)
Diverter vlvs - Horizontal
LMP move to LEB
Place CMP helmet and LEVA on LMP Couch
Verify all visors and shades on CMP LEVA operate
LMP verify hoses routed around RH side
LMP don helmet and LEVA, verify alignment
LMP don EV gloves, verify locked (comfort gloves)
CDR don helmet, verify alignment
CDR don IV gloves (CDR TSB) verify locked (comfort gloves)

Check all connections and locks:

CMP
1. UMB (O2)
2. Elec
3. PCV
4. Purge vlv
5. OPS
6. SCU - OPEN, locked

CDR/LMP
1. COMM
2. O2
3. Gas conn plugs

Pnl 9 - MODE - VOX
VOX SENS TW - ADJUST

Stow checklists, loose items, etc.
CDR/LMP INTEGRITY CHECK

Pnl 380 - SUIT CKT RETURN vlv - close (push)

Pnl 7 - DIRECT O2 - CLOSE (CW)
SUIT PRESS ind - 4.7-5.3 psia
O2 FLOW ind - 0.2-0.4 LB/HR

CAUTION

SUIT TEST vlv should remain in the PRESS position until suit circuit pressure is stabilized to preclude seal scarring. If repositioning of SUIT TEST vlv from PRESS is required prior to suit pressure and O2 flow stabilization, perform the following:

a. O2 DEMAND REG vlv - OFF
b. Allow 15 sec (min) stabilization time
c. Reposition SUIT TEST vlv - DEPRESS or OFF as applicable
d. When suit pressure stabilized, O2 DEMAND REG vlv - BOTH

SUIT TEST vlv - PRESS
DIR O2 - OPEN

O2 FLOW ind - 1.0 LB/HR (pegged)
O2 FLOW HI lt - on
M/A pb lt - ON (push)
When SUIT PRESS ind 1.5-2.0 psi > CAB PRESS
SUIT CKT RETURN vlv - open then close

When SUIT PRESS ind 3.5 - 4.0 psi > CAB PRESS
Verify side hatch dump vlv - closed
Pnl 603 - EVA STA O2 - OFF
DIR O2 - CLOSED
SUIT PRESS ind - 8.8-9.8 psia
Cuff Gage -4.1-4.5 psig
O2 FLOW HI lt - out
Allow O2 FLOW To Stabilize 15 sec
O2 FLOW shall remain below 0.80 LB/HR for 30 sec after stabilization

*If O2 FLOW >0.80 LB/HR reverify*
*all connections and repeat*
*CDR/LMP INTEGRITY CHECK.*
*Continue after recheck if*
*O2 FLOW <0.97 LB/HR for*
*30 sec after stabilization*

SUIT TEST vlv - DEPRESS

Pnl 603 - EVA STA O2 - ON
Adjust side hatch dump vlv - as required
O2 FLOW ind - 0.2-0.4 LB/HR
SUIT PRESS ind - Slightly > CABIN PRESS ind
SUIT TEST vlv - OFF
Pnl 380 - 02 DEMAND REG vlv - BOTH (verify)

CMP HELMET/GLOVE DONNING

Purge vlv - Pull pin (CDR hold), activate purge vlv LO (CW)
CMP - PGA diverter vlvs - (2) vertical
Partially unzip fecal containment bags (2), unplug from pnl 251, temp stow
CMP - adjust PGA tiedown strap
Set wrist rings to engage position

— GO TO CM EVA CUE CARD AND STOW EXP/EVA CHECKLIST —

Don helmet, lock
Don wrist tether - ring fwd
Don LEVA, verify alignment
Don comfort gloves
Don one glove, lock
Pnl 603 - EVA Sta O2 - OFF
Don other glove, lock
Pnl 603 - EVA STA 02 - ON, Modulate OFF/ON as required to pressurize CMP
Cuff Gage - 3.7 - 4.0 psig
Pnl 604 - SUIT PRESS ALARM - ON
Verify Tone - off

Pnl 10 - Adjust CMP Master Vol if required
LMP-Pnl 351 - EMER CAB PRESS sel - OFF

EVA WARNING TONE CHECK

CMP Monitor cuff gage, set PURGE vlv - Hi (CCW), verify EVA warning tone on at 3.1 - 3.4 psig, then PURGE vlv - close
Verify tone - off
PURGE vlv - lock, Hi, CDR install pin

Verify flow & Cuff Gage reads 3.7 - 4.0 psig

CMP INTEGRITY CHECK

Pnl 603 - EVA Sta 02 - OFF, Monitor cuff gage to verify PCV closes - monitor press decay for 1 min, verify decay less than 0.8 psi (If suit press decays 0.3 to 0.8, reverify helmet, wristrings, outer zipper and all connectors locked.)
Tone - On (low flow)

Pnl 603 - EVA Sta 02 - ON
Install guard
Verify PGA press - 3.7 - 4.0 psig and stable
Verify Tone - off
Verify EVA sta press gage - 100-500 psi
Verify surge tank press > 750 psia
CABIN DEPRESS

GN2 vlv handle - pull
Gage reads - min
Leave in vent position
Verify helmet, gloves locked
Confirm GO for depress from Hou

NOTE: EVA warning tone may come on momentarily during depress

Side hatch dump vlv - open, O2 Hi Flow warning lt may come on prior to cabin press reg lock up
Close side hatch dump vlv at 3.25 psia
O2 FLOW ind - Less than 0.5 LB/HR
CDR/LMP verify suit press 3.5-4.0 psia
Side hatch dump vlv - open
Dump cabin to zero

CDR/LMP verify - suit press 3.5-4.0 psia (stable)
  Verify HI O2 flow warning lt - off
CMP verify - CMP cuff gage press 3.7 - 4.0 psig
  EVA sta press gage 100-500 psi
  No tone
Pnl 3 - S-BD AUX TV - TV
Pnl 9 - MODE - INT/PTT

HATCH OPENING
Lock pin release knob - unlock
Lock pin indicator released (white to yellow)
Gear box sel - Unlatch
 Actr handle sel-U
Unstow ACTR handle
Unlock Hatch
ACTR handle SEL-L
Stow actr handle
Gear box SEL - latch
Lower Inner Visors (CMP/LMP)
Open hatch
Verify Hex clears
Verify hatch full open
2 EVA OPERATIONS

Egress
Lower outer visors
Verify TV picture quality
CMP adjust aperture if required

Settings: if needed
DAC-(T8,1/250,3) 6 fps
TV-Focus 4, Zoom 25, Aperture 22

Install TV/DAC pole (align)
Jettison jett bag
Pnl 15 - UTILITY PWR - ON
DAC - on
Verify DAC operation

Transfer to SIM bay and enter foot restraints
LMP tend Umb (stop at mark)
CMP verify cuff gage 3.7 - 4.0 psig

Retrieve Lunar Sounder Cassette
  Remove cover
  Attach hook and lock
  Rotate handle and remove cassette
  Transfer to hatch
  LMP attach LMP tether large hook to cassette and lock
  Remove wrist tether hook
  Temp stow cassette on LMP couch
  CMP return to work station
  CMP verify cuff gage 3.7 - 4.0 psig

Retrieve Pan Camera Cassette
  Remove hard and soft covers
  Attach hook and lock
  Pull pip pin, squeeze handle and remove cassette
Transfer to hatch
LMP attach LMP tether large hook to cassette and
lock
Remove wrist tether hook
Temp stow cassette on LMP couch
CMP - Return to work station
CMP verify cuff gage 3.7 - 4.0 psig
Rest - inspect SIM BAY

Retrieve Mapping Camera Cassette
Remove hard and soft covers
Attach hook and lock
Squeeze handle and rotate
Remove cassette
Transfer to hatch
LMP attach CDR tether large hook to cassette and
lock
Remove wrist tether hook and temp stow cassette
LMP move to C couch area

Pnl 15 - UTILITY PWR - OFF
Rest at hatch
CMP remove TV/DAC Pole
Stow under CDR couch
Ingress
S-BD AUX TV - OFF (CTR)
CDR - PNL 9 - MODE - VOX
3 CM POST EVA

HATCH CLOSING
Unstow lanyard
Pull and close hatch
Verify hex clears
Close hatch
Unstow ACTR handle
Lock hatch
Verify lock pin dropped in (white to white)
Stow ACTR handle
ACTR handle select-N
Gear box SEL-latch (verify)

CABIN REPRESS

Use EVT decal on hatch for Rapid Repress
Side hatch dump vlv - close
Pnl 326 - REPRESS PKG vlv - OFF
Pnl 601 - REPRESS 02 vlv - OPEN then close at cabin press of 1 psia
Cabin press ind-read and monitor for gross leakage (30 sec)
Pnl 601 - REPRESS 02 - OPEN, monitor repress 02 ind to zero
Cabin press approx 2 psia
Pnl 601 - REPRESS 02 vlv - CLOSE

Allow CMP umb flow to bring cabin pressure up to 3.0 psia
CMP disconnect OPS 02 hose and hold (direct into open volume)
OPS 02 - on
During repress Hi 02 FLOW light will come ON
Monitor cabin press to 5.0 psia, then OPS 02 - OFF
Hi 02 FLOW light - OFF
Pnl 9 - MODE - INT/PTT
POST EVA PROCEDURES
Pnl 351 - EMER CAB PRESS sel - BOTH
CDR/LMP doff gloves, then helmets
Pnl 380 - SUIT CKT RTN vlv - open (pull)
Unstow accessory bag from CDR TSB, top pkt.
CMP purge vlv - HI, pull pin, activate purge vlv
   (Stow pin in accessory bag)
Pnl 603 - EVA STA 02 - OFF
Pnl 604 - SUIT PRESS ALARM - OFF
When PGA press zero (psid) CMP pop glove, do not remove gloves
Pnl 603 EVA STA 02 - ON
CMP place both gloves in accessory bag
Remove gloves handling wrist rings only
Doff helmet with LEVA
Pnl 603 EVA STA 02 - OFF
Verify surge tank press > 400 psia
Pnl 326 - REPRESS PKG vlv - FILL

CLEANUP PROCEDURES
Unstow 3 towels from CDR TSB, top pkt
Remove OPS

Wet 1 towel with water gun
Wipe cassette handles with wet towel
Wipe other contaminated areas as required, stow towel in accessory bag
Stow wrist tether in accessory bag
Zip up fecal containment bags (2)
Place Lunar Sounder Cassette in DECON bag (EVA bag), temp stow

Tape (VW pouch) film openings on cassettes, do not cover breather holes, mapping camera only
Stow Tape (VW pouch)
Stow Mapping camera cassette (Handle Up) in Bl
Snap curtain, lock Bl
Stow comfort gloves in accessory bag
Wipe hands with second wet towel, then dry, stow towel in accessory bag
Pnl 10 - POWER - OFF
SUIT POWER - OFF

Pnl 604 - SUIT PRESS ALARM - OFF (verify)
Discon EV umb and waist belt from PGA
Snap OPS to Bl

CMP doff PGA, stow FCS, UCTA, inside PGA
Stow PGA's in LMP couch (or CDR and LMP may stay in PGA's during post EVA)

TO BE PERFORMED WHEN LMP DOFFS PGA:
LMP Pnl 6 - POWER - OFF
SUIT POWER - OFF
Pnl 300 - SUIT FLOW - OFF
Disconnect 02 and comm
Pnl 300 - SUIT FLOW VLV - CABIN FLOW
Doff PGA, stow FCS, UCTA inside PGA

TO BE PERFORMED WHEN CDR DOFFS PGA:
CDR Pnl 9 - POWER - OFF
SUIT POWER - OFF
Pnl 301 - SUIT FLOW - OFF
Disconnect Comm and 02
Pnl 301 SUIT FLOW VLV - CABIN FLOW
Doff PGA, stow FCS, UCTA, inside PGA
Connect lt wt headset as req'd
Pnl 9 - POWER - AUDIO
SUIT POWER - on (up)

CMP/LMP doff biomedical harness (if desired), stow in TSB
CDR reconnect biomedical harness for transmission of data to ground
Load DAP, 11101, 01111
SIM EXP PREP
AUTO RCS SELECT - OFF
    except D1, B2, A3, C4, B3, D4
PCM BIT RATE - HIGH
S-BD AUX TV - SCI
DATA SYS ON - ON
LOGIC PWR (2) - DPLY/RETR
cb INST SCI EQUIP SEB (2) - close
IR - ON
UV - ON
IR EXP COVER - OPEN
UV EXP COVER - OPEN
Manually roll left 40° to 270°
V49 MNVR to UV STELLAR TGT Att (206, 161, 301)
OMNI A
O2 HEATERS 3 - OFF
Temp stow hoses as req'd
Restow LMP LEVA bag - LMP EV gloves, LEVA
Restow CDR LEVA bag - LEVA, CDR EV gloves
Stow LEVA bags in tunnel
Stow CMP helmet in HSB RH LEB with CMP IV gloves
Stow CDR helmet and IV gloves in CDR HSB (CDR TSB)
Stow LMP helmet and IV gloves in LMP HSB
Move DECON bag on LHS if req'd to open A2
Open A2 remove contents
Stow pan camera cassette (handle to LEB)
Install tissues around cassette
Close A2
Discon from Pnl 603 - EVA Umb O2, elec, comm cable, and couch hook
Remove EVA sta O2 gage, place in EVA bag, (Wrist Tether pouch)
Install dust caps: Elec (2), O2 (1) on Pnl 603
Install QD on Pnl 603
Connect Umb dust caps and lock
Stow Umb in umb bag
Stow the following in EV bag
- PCV - Press valve pouch
- Purge valv - Purge valve pouch
- Waist tethers (3) - LM tether pouch
- OPS adapter bkt - PGA adapter plate pouch
- OPS straps (4) - OPS strap pouch
- IV tether - IV tether pouch (resnap comm
cable to LMP hoses)
- Meter covers (4) - meter cover pouch

Verify hatch counterbalance bellcranks are
aligned, install lock pin using tool B
(turn CW to stop)

Reconnect CMP comm cable to O2 hoses

Pnl 15 - UTILITY PWR - OFF (verify)

Remove spring bungee from TV wires and stow
Remove DECON bag from A1 if reqd (temp stow RH LEB)

Stow in A1: or temp stow for later use
- Sect 2 Monitor
- Sect 2 Monitor cable, secure with strap
- Sect 2 TV power cable, secure with strap
- Sect 2 TV camera
- Sect 1 Towels - CDR TSB

Stow in F1:
- DAC 10mm lens
- DAC power cable

Remove EVA MAG, stow in F2
- DAC

Snap straps on pole
Temp stow pole on RH LEB

Remove C couch and temp stow under CDR couch
Stow couch straps in R5

Stow OPS hose, actuator, and flaps, Verify O2 - off
Report OPS press to Hou
Remove A9 Rock bag (A-7) and temp stow

Stow in A7:
- OPS (Flag up, feet inboard)
- EVA equipment container (Fold up, place next to OPS)
- Secure strap
- Lunar Sounder cassette in bag
- Stow entry boots, ropes, headrest pads (or install)
- Vac cleaner bag
- Accessory bag with CMP gloves, wrist tether, and purge valve pin (mark contents on bag and location on entry stowage map)

Stow TV pole and MDC guards on side of A8

Stow in A8:
- Interconnect from CMP O2 hoses - (Sect 1)
- EMU maint kit (CMP TSB, top pkt) - (Sect 1)
- CWG's (CMP TSB) - (Sect 2)
- Tool Kit - (Sect 3)
- Comm carriers (3) or place in TSB
- Close A8

Pnl 302 - SUIT FLOW VLV - CABIN FLOW
- Install Decon bag top A1, A2, A7 as reqd
- Stow umb bag on side of A7 (4 snaps, 2 hooks)
- Unstow and install handcontrollers
- Close F2

GN2 vlv handle - OFF (on hatch)
- Stow hatch lanyard and handle
- Install PGA bag - connect hooks (6 bottom, 2 top)
- Remove counter pressure garment from PGA bag, stow in TSB
- Remove BUSS's (3) from PGA bag, temp stow
- Stow PGA's (3) in bag
- Install couch
- Stow EVA stabilizer strut
- Connect PGA bag upper straps (2)
- Remove flashlight from pnl 603 guard, stow.
X
3-24
Stow LMP hoses, route to RHS
Stow CMP hoses in tunnel
Stow CDR hoses, route to LHS
Stow A9 rock bag between A9 and PGA bag
Stow 4 CM EVA cue cards in R2
CONTINGENCY EVA

1 CM PREP FOR CONTINGENCY EVA
   1 Unstow From A-8
      Sect 1 - 2-02 Interconnects
         - EMU Maint Kit
      Sect 3 - Tool Kit
      Side A-8 - MDC Bars (3)
   2 C & R SUIT FLOW - OFF
   3 Interconnect C & R O2 hoses
   4 Center hoses stowed in tunnel, right hoses secured to tunnel MDC hand straps
   5 Install EVA Stabilizer Strut
   6 TSB's installed on L Girth Ring and R and L LEB
   7 Verify Tool Kit has jack screws fully opened inside, snap to LH Girth Ring
   8 Stow EMU MAINT KIT in CMP TSB, top pkt
   9 Hatch Counterbalance (Engaged or Disengaged)
      (Pull Pip Pin, stow in CMP TSB, top pkt)
   10 MDC Ingress Bar (Stowed or Unstowed)
   11 Install MDC Bars
   12 Install meter covers (4 EVA Bag, A2)

FINAL CABIN PREP
   1 Depress tunnel, if docked
   2 Stow Optics
   3 Stow COAS
   4 Stow cameras and bkt in TSB
   5 Set up comm panels
   6 Place helmet shield (PGA bag) in jett bag
   7 Disconnect PGA Bag from couch
   8 Verify BUSS's covers installed and snapped
   9 Stow BUSS's in PGA bag
   10 Remove center couch
   11 Close and lock marmon clamps
   12 Stow under LMP couch using 2 straps (R5)
   13 Unzip fecal bag
   14 Remove PGA (PGA bag), place on LMP couch
15 Disconnect PGA bag and stow under LMP couch
16 Stow RHC 1 in Fl
17 L and R Couch - Stow foot, leg, and seat pans, 0°
18 LH X-X Strut - Connected or Disconnect and tie off
19 Stow in jettison bag:
   A9 contents and partition
   Misc waste
20 Unstow B5, B6
21 Prepare Jettison Bag, Secure Draw String, Tape

SYSTEM PREPARATION FOR DEPRESS
Pnl 325 - CAB PRESS REL vlv (2) - NORMAL
Pnl 2 - CABIN FANS - OFF
Pnl 602 - Verify REPRESS O2 press 865-935 psi
Pnl 326 - REPRESS PKG vlv - FILL
Pnl 326 - Verify SURGE TANK vlv - ON
Pnl 351 - Verify CAB REPRESS - OFF
Pnl 600 - EMERG O2 vlv - CLOSED
Pnl 601 - Verify REPRESS O2 vlv - CLOSED
Pnl 2 - CRYO PRESS - IND - SRG/3
Pnl 2 - SURGE TANK PRESS - 865-935 psi
Check status of LM prep for egress
Stow loose items
   NOTE: Perform PLSS Comm check if required
   On request by LM,
   VHF AM A - DUPLEX
   VHF AM B - off (ctr) (verify)
   VHF RANGING - OFF (verify)
   Pnl 9 - VHF AM - T/R
Verify Comm with,
   2 PLSS - CDR (EVCS #1) and then
   LMP (EVCS #2)
   or
   1 PLSS - EVCS #1 or #2

FINAL SYSTEMS PREP FOR DEPRESS
EXT LTS - RUN/EVA - on (up) (IF REQ'D)
EXT LTS - RNDZ/SPOT - off (ctr)
2 PREP FOR CABIN DEPRESS
Don PGA
Verify L 02 hoses connected Red/Red, Blue/Blue, Locked
PGA flow diverter valves (2) (horizontal or vertical)
Verify PGA Zipper - Lock-Lock
Unstow helmet
Verify feed port cover installed and locked,
Wipe helmet with anti-fog (EMU KIT, CMP TSB, top pkt)
  dry with tissue
Don helmet and lock
Don gloves and lock
Pnl 380 - SUIT CKT RET vlv - close (push)
Pnl 351 - EMERG CAB PRESS sel - OFF
Check all PGA connections and verify locked (Helmet,
  Wrist, 02 Hoses, Comm, Feedport)
Ingress CDR couch

SUIT CKT CHECK (DECAL)
1 SUIT CKT RETURN VLV - CLOSE
2 CHECK SUIT FLOW VLVS
3 CHECK SUIT PRESS
4 CHECK 02 FLOW <.4
5 SUIT TEST PRESS
6 DIR 02 - OPEN
7 AT 4.0 PSID DIR 02 - CLOSE
8 CYCLE SUIT CKT RETURN VLV
9 CHECK
  SUIT PRESS 8.8-9.8
  CUFF 4.1-4.5
  02 FLOW <.80
  STABLE FOR 30 SEC
10 SUIT TEST DEPRESS
11 SUIT PRESS ~ CABIN
SUIT TEST - OFF
12 VERIFY DEMAND REGS - BOTH

TO REVERSE BEFORE STABLE
A. DEMAND REGS - OFF
B. WAIT 15 SEC
C. SUIT TEST - DEPRESS/OFF
D. DEMAND REG - BOTH
Select attitude control mode and maneuver spacecraft to EVT attitude

CABIN DEPRESS
Egress LH couch and transfer to hatch
Adjust RH strut mirror to read cabin pressure

CABIN DEPRESS (DECAL) - EVT
1. SIDE HATCH DUMP vlv - OPEN
   O2 FLOW HI LT may come on
   prior To CABIN PRESS REG lock up
2. At 3.25 psia, SIDE HATCH DUMP vlv - CLOSE
3. O2 FLOW ind - LESS THAN 0.5 LB/HR
4. CABIN PRESS 3.25 psia
5. SUIT CKT PRESS stable 3.5 - 4.0 psia
6. SIDE HATCH DUMP vlv - OPEN
7. CABIN PRESS ind - 0
8. Verify SUIT CKT PRESS STABLE 3.5-4.0 psia
9. Verify O2 FLOW HI Lt - OFF

HATCH OPENING (DECAL) - EVT
1. GN2 vlv HANDLE - PULL
2. GAGE READS - MIN
3. LOCK PIN RELEASE KNOB - UNLOCK
4. LOCK PIN INDICATOR RELEASED (white to yellow)
5. GEAR BOX SEL - UNLATCH
6. ACTR HANDLE SEL-U
7. UNSTOW ACTR HANDLE
8. UNLOCK HATCH
9. ACTR HANDLE SEL-L
10. STOW ACTR HANDLE
11. GEAR BOX SEL-LATCH
12. OPEN HATCH
13. Start Elapse Time When OPS Activated

JETT: BAG, B5, B6
Station Keep At LM Fwd Hatch

AUTO RCS SELECT - undocked transfer
PITCH - A3, C4 - OFF
VERIFY 1/2° DEADBAND
AUTO RCS SELECT - Docked transfer
All - OFF
4 CM CONTINGENCY EVA

EVT (DOCKED)
Give GO for TRANSFER TO OPS & EVT
Start elapse time when OPS activated

EVT (UNDOCKED, STABLE)
Maneuver CSM apex to LM forward hatch
Give GO for transfer to OPS & EVT
Start elapse time when OPS activated

EVT (UNDOCKED, UNSTABLE)
Maneuver CSM to LM
Give GO for transfer to OPS & EVT
Start elapse time when OPS activated
After CDR & LMP push away from LM, maneuver
apex to CDR and LMP

5 2 OPS EVT

INGRESS
CMP protect RHC
CDR Ingress CM, head first, face toward MDC
and sit on A9 in LEB
Retrieve C O2 hoses and elec umbilical
CMP Connect C electrical umbilical to CDR
CDR Audio panel sws - as desired
Secure position in LEB and manage
lifeline for LMP
LMP remove transfer bag, push inside
LMP Ingress CM, feet first, face toward MDC
and assume position in center couch area
CM back off from LM
CDR Connect R electrical umbilical to LMP
CMP Close hatch
VAC TRANSFER TO CM ECS
(If 25 minutes elapsed from
OPS start time, perform the following)
C and R SUIT FLOW vlvs - OFF
Remove interconnects
Connect O2 hoses (Red/Red, Blue/Blue)
C to CDR, R to LMP
Close Purge vlv
SUIT FLOW vlv - adjust for comfort
OPS O2 - OFF

HATCH CLOSING (DECAL) - EVT (X/4-12)
1 CLOSE HATCH
2 Verify PIP PIN Bracket is to left
3 LOCK HATCH
4 Verify LOCK PIN dropped in (white to white)
5 STOW ACTR HANDLE
6 ACTR HANDLE SELECT-N
7 GEAR BOX SEL-LATCH (verify)

CABIN REPRESS (DECAL) - EVT
1 SIDE HATCH DUMP vlv - CLOSE
2 Pnl 326 - REPRESSION PKG - FILL
3 Pnl 601 - REPRESS O2 vlv - OPEN, then CLOSE at
   cabin press - 1 psia
4 CABIN PRESS ind - monitor for gross
   leakage (30 sec)
5 Pnl 601 - REPRESS O2 vlv - OPEN
6 When surge tank decreases to 150 psia,
   Pnl 326 REPRESS PKG vlv - OFF
7 CABIN PRESS ind - 3.0 psia
8 Pnl 601 - REPRESS O2 vlv - CLOSE
9 Pnl 351 - CABIN REPRESS vlv - OPEN (CW), adjust
   to maintain surge tank press >150 psia
10 Helmet/Glove Doffing
   O2 VLV - OFF
   Depress PGA
   Remove Helmet and Gloves
   Dump OPS into Cabin (if 2 avail)
11 When Cab >4.7, CABIN REPRESS Vlv - OFF
TRANSFER TO ECS
(3.0 PSIA CABIN)
Remove LEVA'S From Helmets
Verify cabin pressure above 3.0 psia
Verify C and R SUIT FLOW vlv - OFF

-CDR-
Remove interconnect from C O2 hoses
CDR OPS O2 - OFF
As PGA press equalizes with cabin, connect hoses to PGA (red to red, blue to blue)
No flow condition, remove helmet at safe cabin press
C SUIT FLOW vlv - adjust for comfort
L SUIT FLOW vlv - increase for comfort
CDR Close Purge vlv

-LMP-
Remove interconnect from R O2 hoses
LMP OPS O2 - OFF
As PGA press equalizes with cabin, connect hoses to PGA (red to red, blue to blue)
No flow condition, remove helmet at safe cabin press
CDR SUIT FLOW vlv (3) - FULL FLOW
LMP Close Purge vlv

POST EVA SYSTEMS CONFIGURATION
CMP CAB PRESS ind - 4.7-5.3 psia
Pnl 351 - CDR CAB REPRESS vlv - OFF (CCW)
Doff gloves, helmets, and LEVA's, if req'd
If helmets and gloves doffed:
Pnl 351 - EMERG CAB PRESS sel - BOTH
Pnl 380 - SUIT CKT RET vlv - open (pull)
OPS DOFFING
Remove waist tethers, lifeline, and stow in TSB
Remove purge valves and stow in TSB
Verify PLSS antenna stowed
Verify OPS 02 - OFF
Verify OPS 02 actuator stowed
Disconnect OPS 02 hose and stow
Secure thermal cover
Doff OPS and straps
Stow interconnects in A8
Secure transfer bag

END OF 2 OPS EVT
(Go to FINAL SYSTEMS CONFIG) (X/4-16)

6 PLSS - OPS EVT

INGRESS (CDR-OPS, LMP-PLSS)
CDR Ingress CM, head first, face toward MDC
    and move to LEB
    Retrieve C O2 hoses and electrical umbilical
CMP Connect C electrical umbilical to CDR
CDR Audio panel sws - as desired
    Secure position in LEB and manage lifeline for LMP
LMP Ingress CM, feet first, face toward MDC
CMP Connect R electrical umbilical to LMP
LMP PLSS PRIM and AUX FEEDWATER - CLOSE
CMP Close hatch

VAC TRANSFER TO CM ECS
    (If 25 minutes elapsed from OPS start time,
     perform the following)

-CDR (OPS)-

CDR Verify C SUIT FLOW vlv - OFF
    Remove interconnect and hand C O2
    hoses to CMP
CMP Connect C O2 hoses to CDR PGA (red to red, blue to
    blue)
CDR Close purge vlv
    C SUIT FLOW vlv - adjust for comfort
OPS 02 - OFF
CDR Verify R SUIT FLOW v1v - OFF
Remove interconnect and hand R O2 hoses to CMP
CMP Connect R O2 hoses to LMP PGA (red to red, blue to blue)
CDR SUIT FLOW v1v (3) - FULL FLOW
LMP Verify flow
PLSS O2 - OFF
PLSS PUMP - OFF
PLSS FAN - OFF
PLSS MODE SEL - POS 0

HATCH CLOSING (DECAL) - EVT (X/4-12)
1 CLOSE HATCH
2 Verify PIP PIN Bracket is to left
3 LOCK HATCH
4 Verify LOCK PIN dropped in (white to white)
5 STOW ACTR HANDLE
6 ACTR HANDLE SELECT-N
7 GEAR BOX SEL - LATCH (verify)

CABIN REPRESS - (DECAL) - EVT
1 SIDE HATCH DUMP v1v - CLOSE
2 Pnl 326 - REPRESS PKG - FILL
3 Pnl 601 - REPRESS O2 v1v - OPEN, then CLOSE at cabin press - 1 psia
4 CABIN PRESS ind - monitor for gross leakage (30 sec)
5 Pnl 601 - REPRESS O2 v1v - OPEN
6 When surge tank decreases to 150 psia,
   Pnl 326 _ REPRESS PKG v1v - OFF
7 CABIN PRESS ind - 3.0 psia
8 Pnl 601 - REPRESS O2 v1v - CLOSE
9 Pnl 351 - CABIN REPRESS v1v - OPEN (CW), adjust to maintain surge tank press >150 psia
10 Helmet/Glove Doffing
    O2 v1v - OFF
    DEPRESS PGA
    Remove Helmet and Gloves
    Dump OPS into cabin (if 2 avail)
11 When Cab >4.7, CABIN REPRESS v1v - OFF
TRANSFER TO ECS (3.0 PSIA CABIN)

Remove LEVA's from helmets
Verify cabin pressure above 3.0 psia
Verify C and R SUIT FLOW vlv - OFF

-CDR (OPS)-

Remove interconnect from C O2 hoses
CDR OPS O2 - OFF
As PGA press equalizes with cabin
Connect hoses to PGA (red to red, blue to blue)
No flow condition, remove helmet at safe cabin press
C SUIT FLOW vlv - adjust for comfort
L SUIT FLOW vlv - increase for comfort
Close Purge vlv

-LMP (PLSS)-

Remove interconnect from R O2 hoses
LMP PLSS O2 - OFF
Connect Hoses to PGA
(red/red, blue/blue)
For no flow condition, avoid negative pressure,
remove helmet at safe cabin press
To depress suit remove PLSS blue hose
Depress blue 02 connector
CDR SUIT FLOW vlv (3) - FULL FLOW
PLSS PUMP - OFF
PLSS FAN - OFF
PLSS MODE SEL - POS 0
Verify PRIM/AUX feedwater - CLOSE
POST EVA SYSTEMS CONFIGURATION

CMP CAB PRESS ind - 4.7-5.3 psia
Pnl 351 - CDR CAB REPRESS vl v - OFF (CCW)
Doff gloves, helmets, and LEVA's, if req'd.
If helmets and gloves doffed - Pnl 351 - EMERG
CAB PRESS sel - BOTH
Pnl 380 - SUIT CKT RET vl v - open (pull)

OPS DOFFING
Remove waist tethers, lifeline, and stow in TSB
Remove purge valves and stow in TSB
Verify PLSS antenna stowed
Verify OPS 02 - OFF
Verify OPS 02 actuator stowed
Disconnect OPS 02 hose and stow
Secure thermal cover
Doff OPS and straps
Stow interconnects in A-8
Secure transfer bag

PLSS/DOFFING
Remove waist tethers, lifeline, and stow in TSB
All RCU ELEC CNTLS - OFF (verify)
Disconnect RCU stow in TSB
Disconnect PLSS 02 and H2O hoses
Disconnect lower, then upper, PLSS straps-Doff PLSS
Stow PLSS-02, H2O, and COMM umbilicals
Temp stow PLSS

END OF PLSS - OPS EVT
(Go To FINAL SYSTEMS CONFIG) (X/4-16)
SIDE HATCH will not latch (frozen gearbox)
*The Following tools are required:
* Tool B, Tool F, (3) jackscrews
*Install (3) jackscrews to restrain hatch
* in closed position
*Use tool B to remove (2) clevis pins
* connecting linkage to gearbox and
* (1) clevis pin from linkage in corner
* above gearbox.
*Tighten jackscrews to close hatch as far
* as possible
*Use tool F on flats of latch bellcrank
* to drive latch to over-center closed position
* (Apply tool F to upper latch on hinge
* side to drive the lower and hinge side
* linkage closed). Apply tool F to center
* latch to drive upper linkage closed. Gearbox
* side linkage may not close if gearbox is
* in full open position.
*Install clevis pin in threaded hole
* in linkage bell crank at upper gearbox
* side (Clevis pin installed when approx half
* the threads are visible).
7 2 PLSS/OPS EVT

INGRESS

CDR Ingress CM, head first, face toward MDC and move to LEB
CDR Secure position in LEB and manage lifeline for LMP
LMP Ingress CM, feet first, face toward MDC and assume position in center couch area
BOTH PLSS PRIM and AUX FEEDWATER - CLOSE
CMP Close hatch

VAC TRANSFER TO CM ECS

Verify C and R SUIT FLOW vlv - OFF
Remove interconnects
Remove OPS 02 hose and Purge vlv
Connect 02 hoses to PGA (red/red, blue/blue)
C-CDR, R-LMP
SUIT FLOW vlv - adjust for comfort
PLSS 02 - OFF
PLSS PUMP - OFF
PLSS FAN - OFF

CONNECT TO CM COMM, IF REQ'D

PLSS MODE SEL - POS 0
Disconnect PLSS COMM
Connect electrical umbilical (C-CDR, R-LMP)
Audio panel sws - as desired

HATCH CLOSING (DECAL) - EVT (x/4-12)
1 CLOSE HATCH
2 Verify PIP PIN Bracket is to left
3 LOCK HATCH
4 Verify LOCK PIN dropped in (white to white)
5 STOW ACTR HANDLE
6 ACTR HANDLE SELECT-N
7 GEAR BOX SEL - LATCH (verify)
CABIN REPRESS - (DECAL) - EVT
1. SIDE HATCH DUMP vlv - CLOSE
2. Pnl 326 - REPRESS PKG - FILL
3. Pnl 601 - REPRESS 02 vlv - OPEN, then CLOSE at cabin press - 1 psia
4. CABIN PRESS ind - monitor for gross leakage (30 sec)
5. Pnl 601 - REPRESS 02 vlv - OPEN
6. When surge tank decreases to 150 psia, Pnl 326 - REPRESS PKG vlv - OFF
7. CABIN PRESS ind - 3.0 psia
8. Pnl 601 - REPRESS 02 vlv - CLOSE
9. Pnl 351 - CABIN REPRESS vlv - OPEN (CW), Adjust To maintain surge tank press >150 psia
10. Helmet/Glove Doffing
    02 vlv - OFF
    Depress PGA
    Remove Helmet and Gloves
    Dump OPS into cabin (if 2 avail)
11. When Cab >4.7, CABIN REPRESS Vlv - OFF

TRANSFER TO ECS (3.0 PSIA CABIN)

-CDR-

Remove LEVA's from helmets
Verify cabin pressure above 3.0 psia
Verify C and R SUIT FLOW vlv - OFF
Remove interconnect from C O2 hoses

CDR PLSS 02 vlv - OFF
Open Purge vlv to equalize press
No flow condition, avoid negative press, remove helmet at safe cabin press
Remove OPS hose and Purge vlv
Connect hoses to PGA (red/red, blue/blue)
C SUIT FLOW vlv - adjust for comfort
L SUIT FLOW vlv - increase for comfort
PLSS PUMP - OFF
PLSS FAN - OFF
Remove LEVA
Remove interconnect from O2 hoses
LMP PLSS O2 vlv - OFF
Open Purge vlv to equalize press
No flow condition, avoid negative press, remove helmet at safe cabin press
Remove OPS hose and Purge vlv
Connect hoses to PGA connectors (red/red, blue/blue)
CDR SUIT FLOW vlv (3) - FULL FLOW
LMP PLSS PUMP - OFF
PLSS FAN - OFF

CONNECT TO COMM
Verify SUIT PWR - OFF
Verify PWR - OFF
Verify AUDIO CONT - NORM
PLSS MODE SEL - POS 0
Disconnect PLSS COMM
Connect electrical umbilical to PGA
Audio panel sws - as desired

POST EVA SYSTEMS CONFIGURATION
CMP CAB PRESS ind - 4.7-5.3 psia
Pnl 351 - CDR CAB REPRESS vlv - OFF (CCW)
Doff gloves, helmets, and LEVA's, if req'd
If helmets and gloves doffed - Pnl 351 - EMERG
   CAB PRESS sel - BOTH
Pnl 380 - SUIT CKT RET vlv - open (pull)
PLSS/OPS DOFFING

Remove waist tethers, lifeline, and stow in TSB
All RCU ELEC CNTLS - OFF
Disconnect RCU stow in TSB
Disconnect PLSS 02 and H2O hoses
Disconnect lower then upper PLSS straps-Doff PLSS
Stow PLSS-02, H2O, and COMM umbilicals
Stow OPS-02 Actuator and 02 hose
Temp stow PLSS/OPS

FINAL SYSTEMS CONFIGURATION

Pnl 2 - CRYO PRESS IND-SRG/3
Pnl 2 - SURGE TANK PRESS - > 500 psia
Pnl 351 - Verify CAB REPRESS vlv - OFF (CCW)
Pnl 601 - Verify REPRESS 02 - CLOSE
Pnl 326 - REPRESS PKG vlv - FILL
Pnl 602 - Verify Repress 02 press increasing
Pnl 2 - SURGE TANK PRESS - 865-935 psia
Pnl 2 - CRYO PRESS IND-1/2
Pnl 326 - REPRESS PKG vlv - OFF

CM EQUIPMENT JETTISON

Inspect PGA zipper-verify lock-lock

SYSTEMS PREPARATION FOR DEPRESS

SUIT FLOW vlv - SUIT FULL FLOW
Pnl 2 - CABIN FANS - OFF
Pnl 351 - CAB REPRESS - OFF
Pnl 326 - REPRESS PKG VLV - FILL
Pnl 325 - CAB PRESS REL VLV (2) - NORMAL
Pnl 380 - SUIT CKT RET vlv - open (pull)
Pnl 351 - EMER CAB PRESS sel - BOTH
Pnl 602 - Verify Repress 02 pressure 865-935 psi
Pnl 600 - EMERGENCY 02 vlv - CLOSED
Pnl 601 - REPRESS 02 vlv - CLOSED
Pnl 326 - Verify SURGE TANK vlv - ON
Pnl 2 - CRYO PRESS IND-SRG/3
Verify surge tank pressure 865-935 psi
EQUIPMENT PREPARATION FOR DEPRESS

Stow loose items
Prepare all equipment to be jettisoned and secure.
   PLSS (1-2)
   RCU (1-2)
   OPS (Retain 1)
   PURGE VALVE (Retain 1)
   LIFELINE (1)
Retain both LEVA's
Retain both WAIST TETHERS

PREP FOR CABIN DEPRESS

Verify O2 hoses connected (red/red, blue/blue)
P GA diverter valves- horizontal or vertical
Unstow helmet
Verify feed port cover installed and locked,
   wipe helmet with anti-fog
Position mikes, don helmet and "lock"
Secure helmet stowage bags
Don gloves and lock
Pnl 380 - SUIT CKT RET vlv - close (push)
Pnl 351 - EMER CAB PRESS sel - OFF
Check all PGA connections and verify
   lock-lock (Helmet, Wrist, O2 Hoses, Comm, Feedport)
SUIT CKT CHECK (DECAL)

1. SUIT CKT RETURN VLV - CLOSE
2. CHECK SUIT FLOW VLVS
3. CHECK SUIT PRESS
4. CHECK O2 FLOW < .4
5. SUIT TEST PRESS
6. DIR O2 - OPEN
7. AT 4.0 PSID DIR O2 - CLOSE
8. CYCLE SUIT CKT RETURN VLV
9. CHECK
   - SUIT PRESS 8.8-9.8
   - CUFF 4.1-4.5
   - O2 FLOW < .80
   - STABLE FOR 30 SEC
10. SUIT TEST DEPRESS
11. SUIT PRESS ~ CABIN
12. SUIT TEST - OFF
13. VERIFY DEMAND REGS - BOTH

TO REVERSE BEFORE STABLE
A. DEMAND REGS - OFF
B. WAIT 15 SEC
C. SUIT TEST - DEPRESS/OFF
D. DEMAND REG - BOTH

CABIN DEPRESS (DECAL) - EVT

1. SIDE HATCH DUMP vlv - OPEN
   (O2 FLOW HI WARNING LT may come on
   prior to CABIN PRESS REG LOCK UP)
2. At 3.25 psia, SIDE HATCH DUMP vlv - CLOSE
3. O2 FLOW ind - less than 0.5 LB/HR
4. CABIN PRESS 3.25 psia
5. SUIT CKT PRESS STABLE 3.5-4.0
6. SIDE HATCH DUMP vlv - OPEN
7. CABIN PRESS ind - 0
8. Verify SUIT CKT PRESS stable 3.5-4.0 psia
9. Verify O2 FLOW HI LT - OFF
HATCH OPENING (DECAL) - EVT

1. GN2 vlv HANDLE - PULL
2. GAGE READS - MIN
3. LOCK PIN RELEASE KNOB - UNLOCK
4. LOCK PIN INDICATOR RELEASED (white to yellow)
5. GEAR BOX SEL - UNLATCH
6. ACTR HANDLE SEL-U
7. UNSTOW ACTR HANDLE
8. UNLOCK HATCH
9. ACTR HANDLE SEL-L
10. STOW ACTR HANDLE
11. GEAR BOX SEL-LATCH
12. OPEN HATCH
13. START ELAPSE TIME WHEN OPS ACTIVATED

EQUIPMENT JETTISON

JETTISON EQUIPMENT:
- PLSS (1-2)
- RCU (1-2)
- OPS (Retain 1)
- PURGE VALVE (Retain 1)
- LIFELINE (1)

Retain both LEVA's
Retain both WAIST TETHERS

HATCH CLOSING (DECAL) (X/4-12)

1. CLOSE HATCH
2. Verify Pip pin bracket is to left
3. LOCK HATCH
4. Verify LOCK PIN dropped in (white to white)
5. STOW ACTR HANDLE
6. ACTR HANDLE SELECT-N
7. GEAR BOX SEL - LATCH (verify)
CABIN REPRESS (DECAL)

1. SIDE HATCH DUMP vlv - CLOSE
2. Pnl 326 - REPRESS PKG - FILL
3. Pnl 601 - REPRESS 02 vlv - OPEN, then CLOSE at cabin press - 1 psia
4. CABIN PRESS ind - monitor for gross leakage (30 sec)
5. Pnl 601 - REPRESS 02 vlv - OPEN
6. When surge tank decreases to 150 psia, Pnl 326 - REPRESS PKG vlv - OFF
7. CABIN PRESS ind - 3.0 psia
8. Pnl 601 - REPRESS 02 vlv - CLOSE
9. Pnl 351 - CABIN REPRESS vlv - OPEN (CW), adjust to maintain surge tank press >150 psia
10. Helmet/Glove Doffing
    O2 VLV - OFF
    DEPRESS PGA
    Remove Helmet and Gloves
    Dump OPS into cabin (if 2 avail)
11. When Cab >4.7, CABIN REPRESS vlv - OFF

SYSTEM CONFIGURATION

Pnl 2 - CAB PRESS ind - 4.7 - 5.3 psia
Pnl 351 - CAB REPRESS vlv - OFF (CCW)
Doff gloves and helmets, if req'd
If helmets and gloves doffed:
    Pnl 351 - EMERG CAB PRESS sel - BOTH
    Pnl 380 - SUIT CKT RET vlv - open (pull)

POST EVA CABIN CONFIGURATION

EXT LTS - RUN/EVA - OFF (down)
Perform as desired
(a) Recharge Repress Pkg
(b) Change crew stations
(c) Restow tool B & jack screws
(d) Unstow & install PGA bag
(e) Reinstall center couch
(f) Connect counterbalance (Pip Pin in TSB)
8 EVT EQUIPMENT STOWAGE FOR ENTRY

I. CM entry without suits:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>STOWAGE LOCATION FOR ENTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. OPS (2)</td>
<td>In PGA Bag - over PGA (or one in A7)</td>
</tr>
<tr>
<td>b. Purge Valve (2)</td>
<td>A7</td>
</tr>
<tr>
<td>c. Lifeline</td>
<td>In PGA Bag</td>
</tr>
<tr>
<td>d. EV Gloves</td>
<td>On PGA</td>
</tr>
<tr>
<td>e. LEVA (2)</td>
<td>2 on helmet attached to suits in RH &amp; LH sleep restraints</td>
</tr>
<tr>
<td>f. Waist tether (2)</td>
<td>EVA BAG A7</td>
</tr>
<tr>
<td>g. Rock Bag w/Decom</td>
<td>In Decom Bag on top of A7 or A1</td>
</tr>
<tr>
<td>h. Suits - with elec</td>
<td>2 Suits in sleep restraint under LH &amp; RH couch w/tie down rope</td>
</tr>
<tr>
<td>e covers</td>
<td>1 Suit with OPS in PGA Bag w/tie down rope</td>
</tr>
<tr>
<td>Note: Stow RH &amp; LH</td>
<td></td>
</tr>
<tr>
<td>i. Helmets</td>
<td>2 On suits with LEVA</td>
</tr>
<tr>
<td>j. IV Gloves</td>
<td>1 In PGA Bag</td>
</tr>
<tr>
<td>k. ISA w/Decom Bag</td>
<td>On A2</td>
</tr>
</tbody>
</table>

Note: Stow RH & LH Suits first
II. CM entry with suits:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>STOWAGE LOCATION FOR ENTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. OPS (2)</td>
<td>LH &amp; RH sleep restraint in PGA Bag w/tie-down rope (or one in A7)</td>
</tr>
<tr>
<td>b. Rock Bag</td>
<td>On A7 or A1</td>
</tr>
<tr>
<td>in Decom Bag</td>
<td></td>
</tr>
<tr>
<td>c. Purge Valve (2)</td>
<td>In EVA Bag (A7)</td>
</tr>
<tr>
<td>d. Waist Tether (2)</td>
<td>EVA Bag (A7)</td>
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<tr>
<td>e. EV Gloves</td>
<td>On PGA</td>
</tr>
<tr>
<td>f. LEVA (2)</td>
<td>PGA Bag</td>
</tr>
<tr>
<td>g. Lifeline</td>
<td>PGA Bag</td>
</tr>
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</table>

III. The following equipment may be transferred in PGA pockets during the EV transfer:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>STOWAGE LOCATION</th>
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</thead>
<tbody>
<tr>
<td>a. Film Magazines</td>
<td>Vol R13, A8</td>
</tr>
<tr>
<td>b. Log Books</td>
<td>Vol R1, R2 and R3</td>
</tr>
<tr>
<td>NO.</td>
<td>ITEM</td>
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DATE: 9/29/72

X 5-__
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DATE: 9/29/72

X 5---
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5-
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*Date:* 9/29/72
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**DATE:** 9/29/72
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**16 MM CAM TYPE**

**PHOTO LOG**

**MAG BB**

- ASA 64
- X 6-2
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### REMARKS

(f, t, LENS, FILTER)

Orbital Science

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70 MM CAM TYPE

PHOTO LOG X

6-16

ASA 64

MAG MM

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70 MM CAM TYPE PHOTO LOG \(X\) 6-17 MAG NN ASA 64

DATE 9/29/72
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**70 MM CAM TYPE**

**PHOTO LOG** 6-21

**MAG** ASA 64
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70 MM CAM TYPE

PHOTO LOG X
6-25

MAG RR
ASA 4000

DATE 9/29/72
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35 MM CAM TYPE

PHOTO LOG

MAG UU

X

6-29

ASA 4000

DATE 9/29/72
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35 MM CAM TYPE

PHOTO Log X
6-30

MAG VV
ASA 4000

DATE 9/29/72
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35 MM CAM TYPE

PHOTO LOG X
6-32

MAG XX
ASA 4000

DATE 9/29/72
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REMARKS (f, t, LENS, FILTER)