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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

APOLLO 17

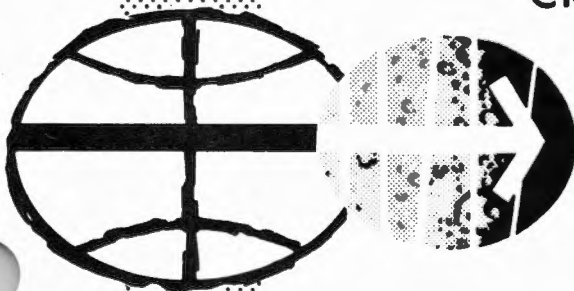
ALL LAUNCH DATES

BASIC

CSM EXP/EVA CHECKLIST

PREPARED BY

EVA & EXPERIMENTS BRANCH
CREW PROCEDURES DIVISION



MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEPTEMBER 29, 1972

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APOLLO 17

CSM EXP/EVA CHECKLIST

SEPTEMBER 29, 1972

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ACKNOWLEDGMENT

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CM Experiments <i>RAA</i> (Section 2)	Robert H. Nute EVA and Experiments CG34	Ext 4637 Bldg 4 Rm 216
CM EVA (Section 3) <i>KE</i>	James L. Ellis EVA and Experiments CG32	Ext 3091 Bldg 4 Rm 222
Contingency EVA (Section 4) <i>KE</i>		

Any organization having specific comments regarding a particular area of responsibility should contact the individual(s) listed above.

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CSM EXP/EVA CHECKLIST

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1-1

SIM EXPERIMENTS

1 SIM EXP PREP

1 SIM BASIC CONFIGURATION

AUTO RCS SELECT - OFF (Pnl 8)

except A1,C2 (or D1,B2), A3,C4,B3,D4

(Note: Use D1, B2 for transearth coast)

PCM BIT RATE - HIGH (Pnl 3)

S-BD AUX TV - SCI

SM/AC PWR - ON (Pnl 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 (Pnl 278)

IR EXP COVER - CLOSE

UV EXP COVER - CLOSE

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SIM
EXPERIMENTS

SIM
EXPERIMENTS

A	B	C	D	E
SIM ATT	MAP CAMR (COVER/ POSTION)	LS HF ANT	IR COVER	UV COVER
+ +XFWD - -XFWD * NON SIM	0 CLOSED 1 OPEN/EXTD 2 OPEN/RETR	0 RETR 1 EXTD	0 CLOSED 1 OPEN	0 CLOSED 1 OPEN
F	G	H	I	J
PAN CAMR	MAP CAMR/ LASER ALTM	LS	IR	UV
0 OFF/STBY 1 PWR/STBY 2 PWR/OPERATE 3 BOOST/STBY	0 OFF/OFF 1 STBY/OFF 2 ON/ON 3 STBY/ON 4 ON/OFF 5 ON (IMC OFF)/OFF	0 OFF 1 HF MODE 2 VHF MODE 3 RECEIVE ONLY 4 STBY	0 OFF 1 ON	0 OFF 1 ON

2 SIM STATUS CODE

X
1-2

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X
1-3

- 3 PRE-SPS BURN PREP
LASER ALTM - OFF
ANTS, CAMR, & COVERS - RETR
LOGIC PWR (2) - OFF
SM/AC PWR - ON (Pn1 181)
MAP CAM ON - STBY
IMAGE MTN - OFF
PAN CAM PWR - BOOST
- 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 (Pn1 181)
S-BD AUX TV - off (ctr) (Pn1 3)
DATA SYS ON - OFF
- 6 KILL PWR
NONESS BUS - OFF (Pn1 5)

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X
1-4

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.

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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)

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X
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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 - HTRS
UV SPECT - ON
IR - OFF (on STDN cue)

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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

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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

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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

(Pnl 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 Malf. Proc. X/1-27 *

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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

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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

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- 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
ThermaT - 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

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1-13

- 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)

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1-14

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.

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1-15

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

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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)

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1-17

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

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1-18

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)

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1-19

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)

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1-20

- 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)

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1-21

SIM BAY ATTITUDE CONTROL
FAILURE MATRIX

FAILED AUTO COIL	RHC	PULL CB CONTR/DIRECT	ROT CONTR PWR SWITCH
A3 (+ PITCH) B3 (+YAW) C4 (- PITCH) D4 (- YAW)	#2	2 - MNB 2 - MNA 2 - MNB 2 - MNA	DIRECT 2 MNA/MNB (ROT CONTR PWR NORMAL 2 - OFF)
A3 (+ PITCH) B3 (+ YAW) C4 (- PITCH) D4 (- YAW)	#1	1 - MNA 1 - MNB 1 - MNA 1 - MNB	DIRECT 1 MNA/MNB (ROT CONTR PWR NORMAL 1 - OFF)

(Configuration for firing a single CSM RCS direct jet
when a forward CSM RCS auto coil has failed)

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1-22

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DATE _____

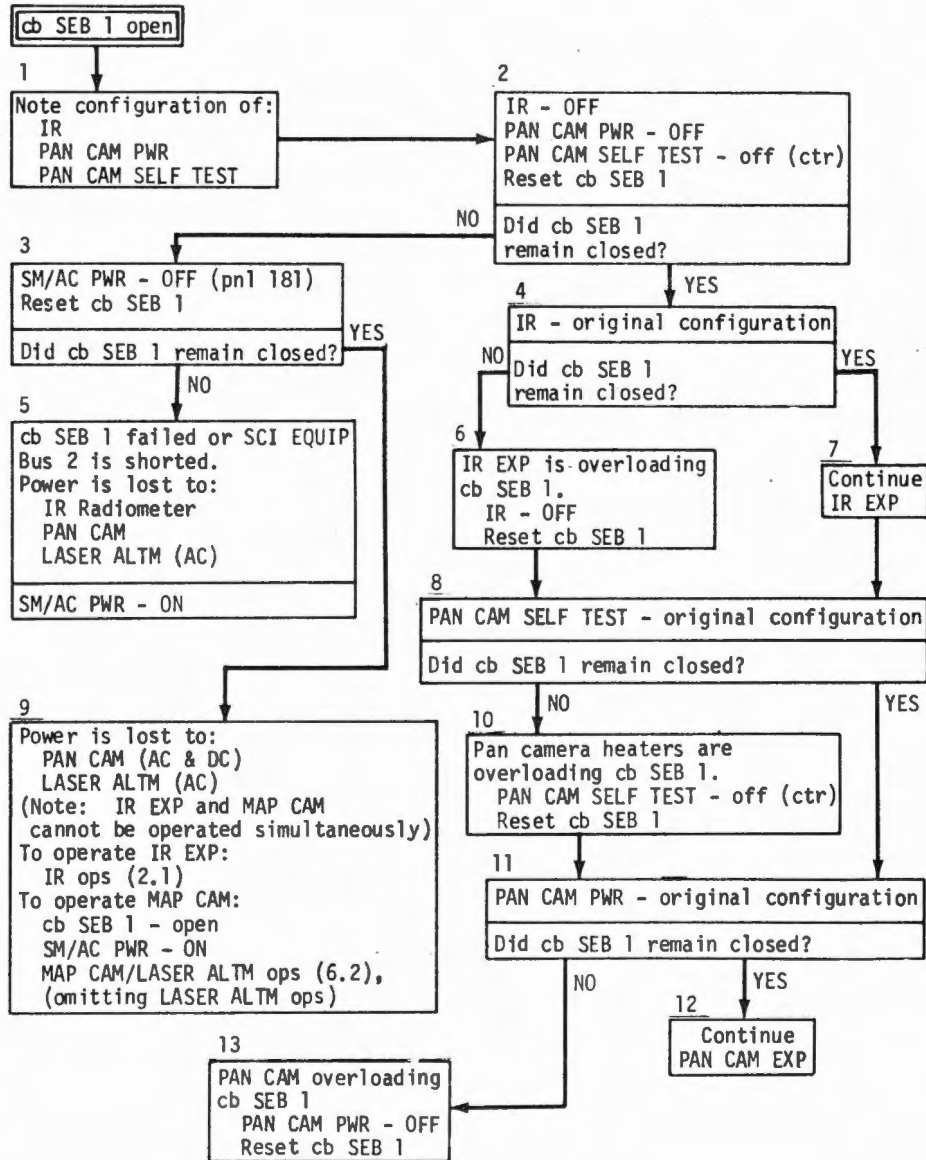
DATE 9/29/72

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1-23

INSTRUMENTS SCI EQUIP SEB 1

SIM MALFUNCTION
PROCEDURES

DATE 9/29/72



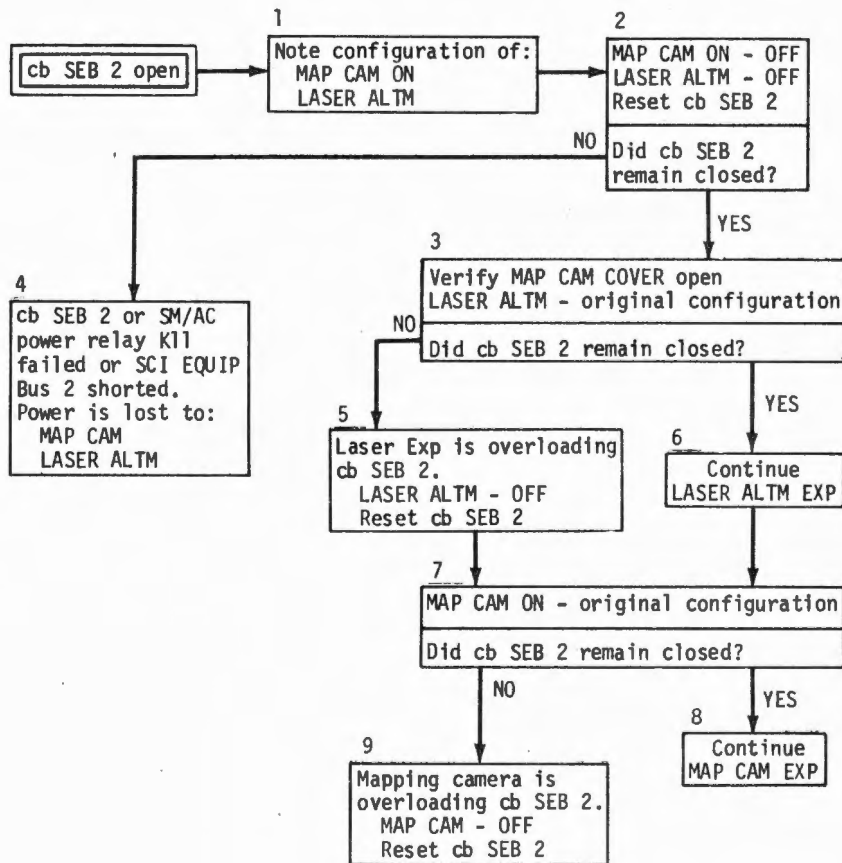
BACK.

COLOR _____

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1-24

INSTRUMENTS SCI EQUIP SEB 2

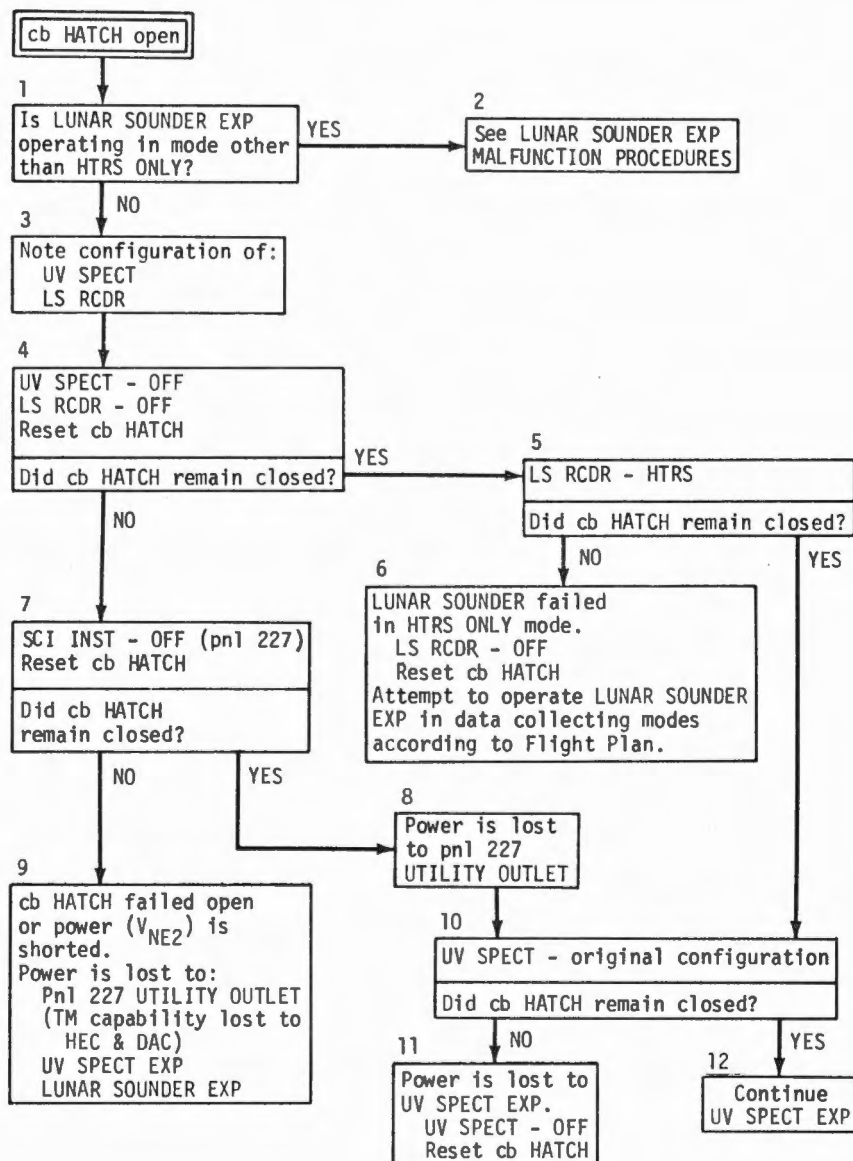
SIM MALFUNCTION
PROCEDURES



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1-25

INSTRUMENTS SCI EQUIP HATCH

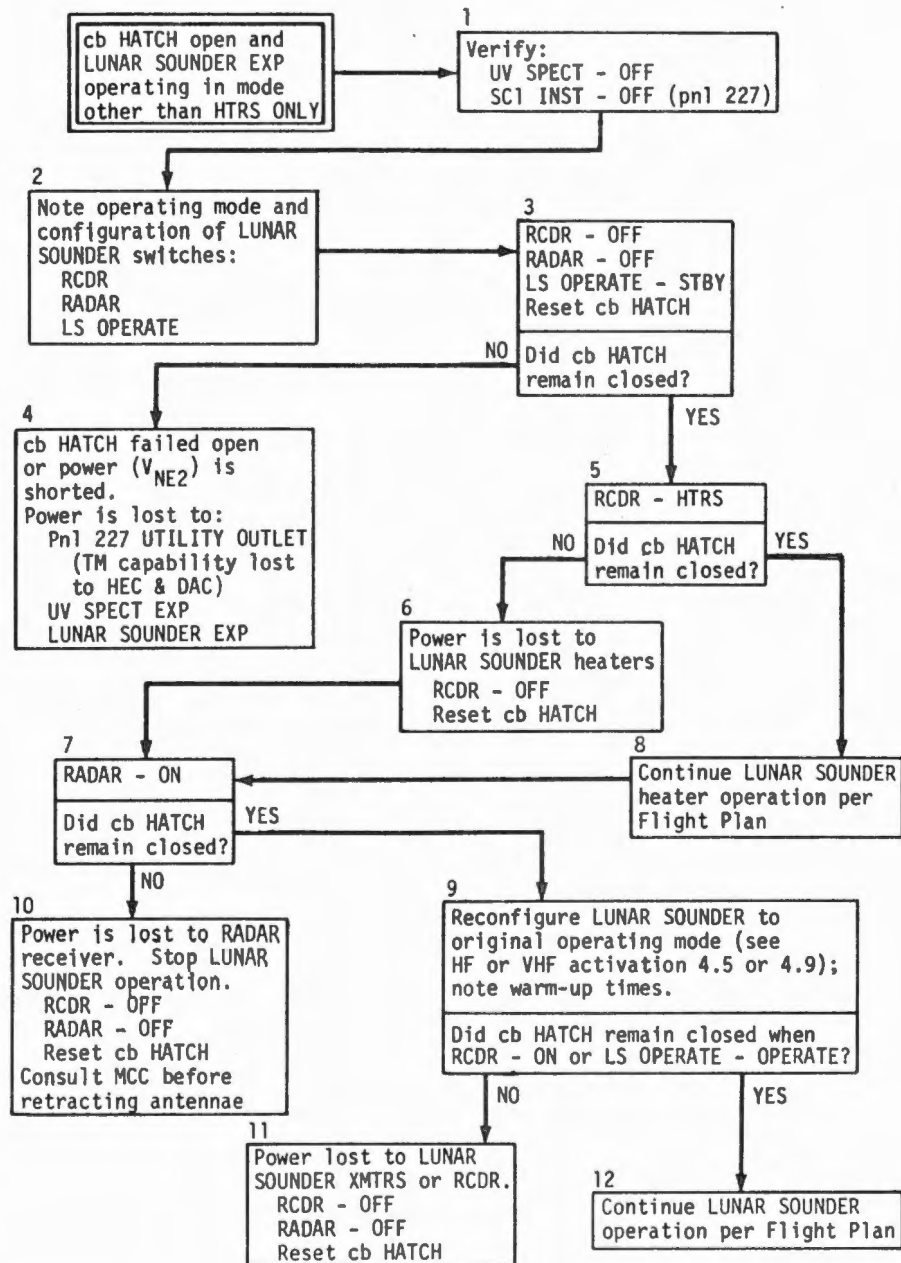


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LUNAR SOUNDER EXP
MALFUNCTION PROCEDURES

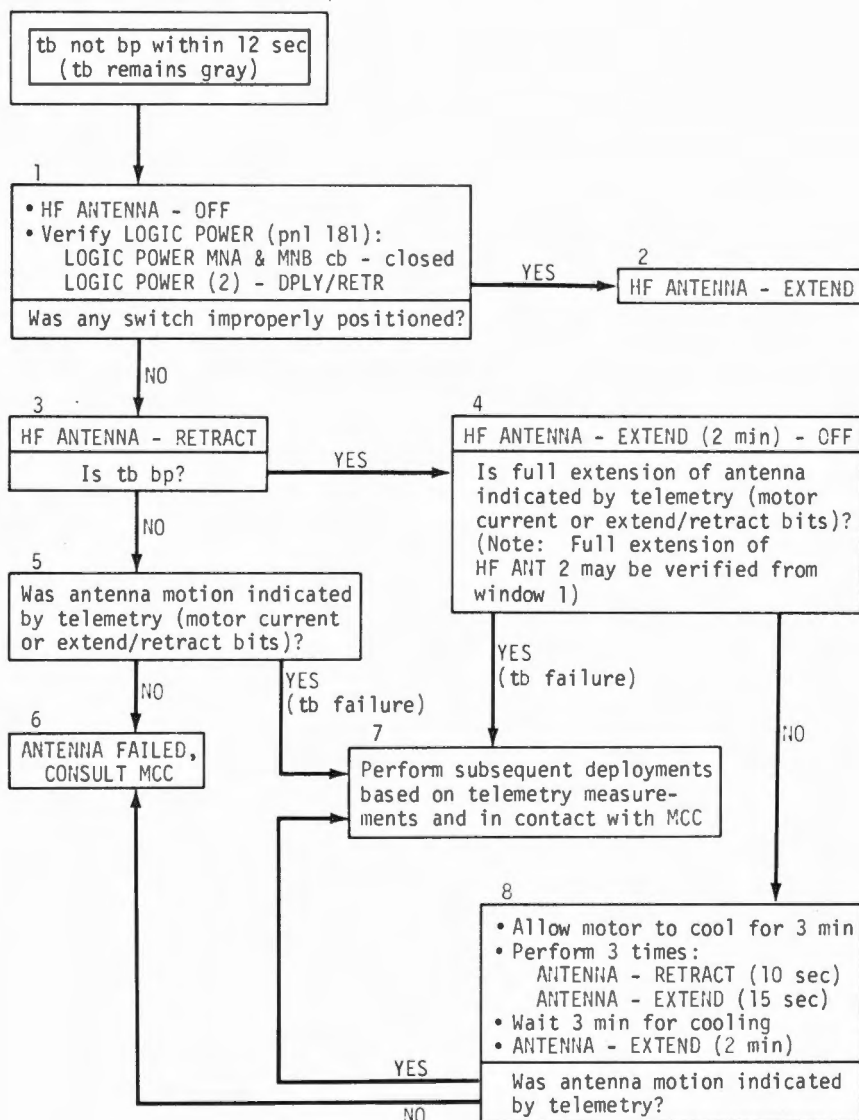


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1-27

HF ANTENNA DEPLOYMENT MALFUNCTION PROCEDURE

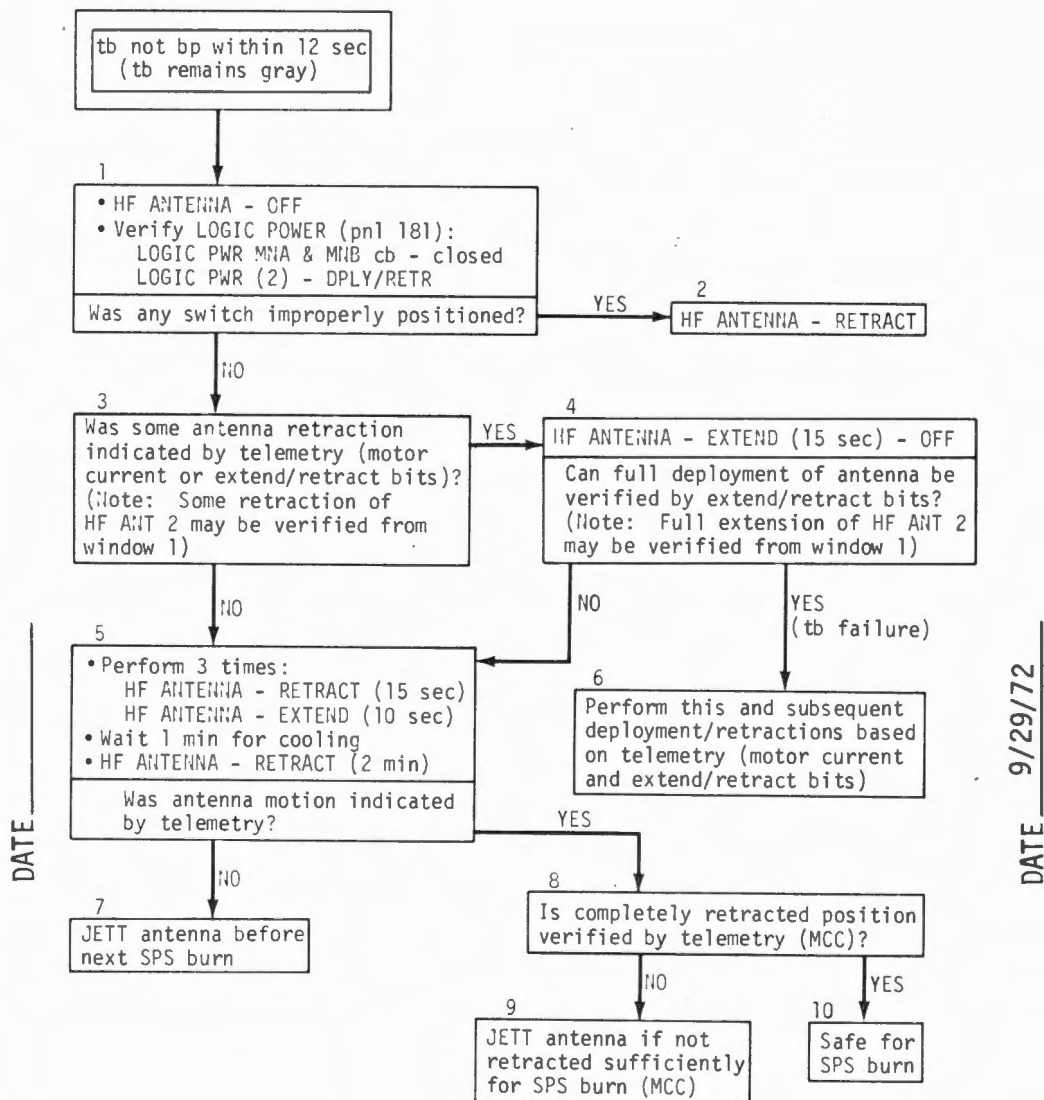


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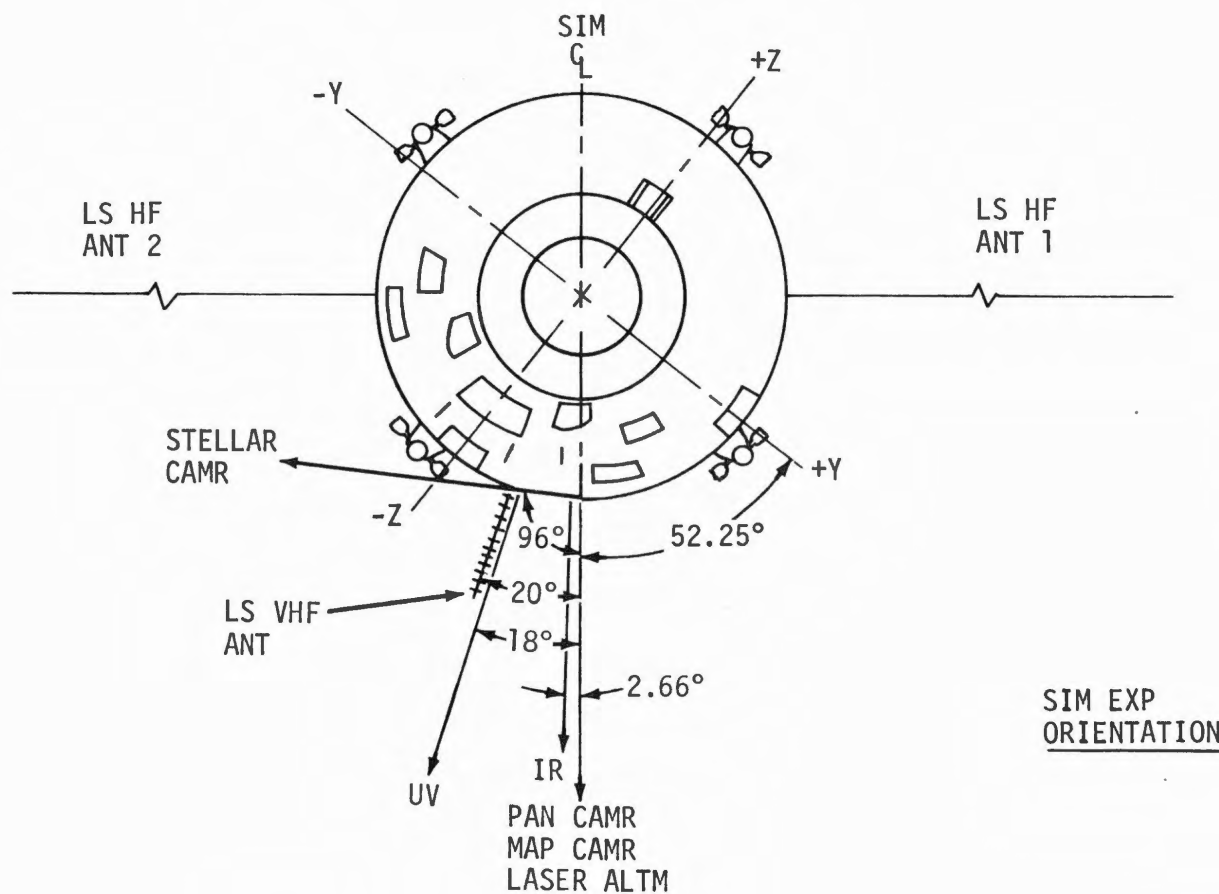
DATE

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1-28

HF ANTENNA RETRACTION MALFUNCTION PROCEDURE

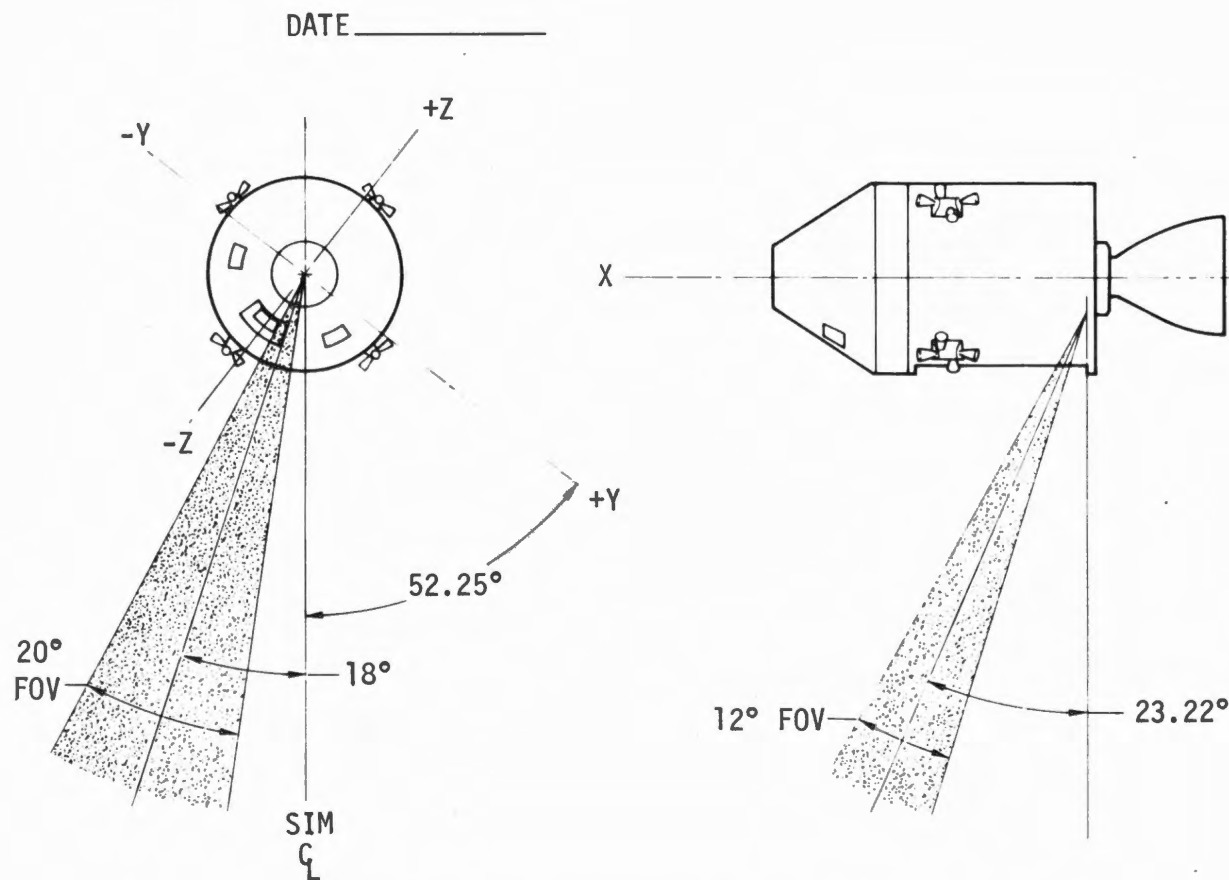


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1-29

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UV SPECTROMETER ORIENTATION

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X
2-1

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")

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CM
EXPERIMENTS

BACK

COLOR _____

X
2-2

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

CM
EXPERIMENTS

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)

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X
2-3

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 condit (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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DATE

DATE 9/29/72

X
2-3b

[illegible]

DATE _____

$$\begin{array}{r} x \\ 2-3c \end{array}$$

X
2-3d

DATE _____

X
2-3f

DATE _____

[illegible]

DATE _____

[illegible]

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X
2-3g

DATE _____

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$$\begin{matrix} X \\ 2-3j \end{matrix}$$
[illegible]

DATE _____



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2-31

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2-4

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

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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
DAC - OFF

Let HFC unit cool down

Start PTC spin up wait 1 hr
until next test

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X
2-6

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

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X
2-7

3 SOLAR CORONA (SUNSET) (GET 208,)
(EL-9 FR REQ) (DARKNESS REQ)

1 P20 OPT 5 (-X FORWARD, ORB RATE)

2 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

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DATE

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X
2-8

3 SEQUENCE #1 - Timing accuracy reqd ~2 sec

0:00 MISSION TIMER, RESET/START

T START _ _ _ : _ _ : _ _
_ _ _ : _ _ : _ _
(SS - 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

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X
2-9

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

1 P20 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

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X
2-10

3 SEQUENCE #1 - Timing accuracy reqd ~2 sec

0:00 MISSION TIMER, RESET/START

T START — — — — —
 (SR-7 MIN)

PCM BIT RATE - HIGH (verify)

EL
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

DATE

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X
2-10a

CMP SOLAR CORONA SKETCH PAD

SUNRISE, GET _____

SUNSET, GET _____

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SOLAR CORONA
SKETCH PADS

BACK



COLOR _____

X
2-10b

SUNRISE, GET _____

SUNSET, GET _____

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SOLAR CORONA
SKETCH PADS



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X
2-10c

CDR SOLAR CORONA SKETCH PAD

SUNRISE, GET _____

SUNSET, GET _____

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DATE _____

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X
2-10d

SUNRISE, GET _____

SUNSET, GET _____

DATE _____

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2-10e

LMP SOLAR CORONA SKETCH PAD

SUNRISE, GET _____

SUNSET, GET _____

DATE 9/29/72

DATE _____

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X
2-10f

SUNRISE, GET _____

SUNSET, GET _____

DATE _____

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X
2-11

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 ~2 sec
Start pitch rate

MIN SEC

0:00 MISSION TIMER, RESET/START

T START _____:_____:_____
(SR-15 MIN)

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

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2-12

3 Record FR # _____
Stow camera

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2-13

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/VHBW-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

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X
2-14

2 ZODIACAL SEQ

Timing accuracy reqd ~2 sec

MIN SEC

0:00 MISSION TIMER, RESET/START

T START — — — — —
(SR-15 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

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3 Record FR # _____
Stow camera

X
2-15

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
DESIRABLE < .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 #

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8 L-4 LIBRATION POINT PHOTO (GET)
(6 FR REQ)

- 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/VHBW - 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

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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

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Point camera NORTH window 3

12:30	Cycle 1	FR
13:00	Cycle 1	FR
13:30	Cycle 1	FR
14:00	Cycle 1	FR
14:30	Cycle 1	FR
15:00	Cycle 1	FR
15:30	Cycle 1	FR
16:00	Cycle 1	FR
16:30	Cycle 1	FR
17:00	Cycle 1	FR
17:30	Cycle 1	FR
18:00	Cycle 1	FR
18:30	Cycle 1	FR
19:00	Cycle 1	FR
19:30	Cycle 1	FR
20:00	Cycle 1	FR
20:30	Cycle 1	FR
21:00	Cycle 1	FR
21:30	Cycle 1	FR
22:00	Cycle 1	FR
22:30	Cycle 1	FR
23:00	Cycle 1	FR

3 Lights up
Record FR # _____

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2-19

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

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BIOMEDICAL URINE SAMPLING SYSTEM (BUSS)

VOIDING

Unstow BUSS from stowage package (U1)
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

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BUSS

BACK

COLOR _____

X
2-22

BUSS

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3-1

1 CM EVA PREP

CABIN PREP FOR EVA

CDR and LMP don biomed harness and verify operation

Stow Optics

Pn1 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

CM EVA

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BACK

COLOR _____

X
3-2

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

CM EVA

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3-3

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 F1

DAC, install mag FF (F2)

Power cable

Close F1

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 1 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)

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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)

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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 02 - OFF (verify)
Attach EV umbilical to Pnl 603 - (route over couch
beam and under wires)
02/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

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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
CWG - 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 vlvs - as desired
Pn1 302 - Suit Flow - full flow (If reqd)
Move scissors to PGA EVA pocket

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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

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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 02 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)

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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

02 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

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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 O2 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 O2 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 O2 actuator to brkt
Conn OPS O2 hose to PGA, route under OPS and
under left arm (LMP assist)

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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 (02)

2. Elec

3. PCV

4. Purge vlv

5. OPS

6. SCU - OPEN, locked

CDR/LMP

1. COMM

2. 02

3. Gas conn plugs

Pnl 9 - MODE - VOX
VOX SENS TW - ADJUST

Stow checklists, loose items, etc.

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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 sta-
bilized 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

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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 - O2 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

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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
v1v - Hi (CCW), verify EVA warning
tone on at 3.1 - 3.4 psig,
then PURGE v1v - close
Verify tone - off
PURGE v1v - 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, wriststrings, 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

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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

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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

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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

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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

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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 B1
Snap curtain, lock B1
Stow comfort gloves in accessory bag
Wipe hands with second wet towel, then dry,
stow towel in accessory bag

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Pn1 10 - POWER - OFF
SUIT POWER - OFF

Pn1 604 - SUIT PRESS ALARM - OFF (verify)
Discon EV umb and waist belt from PGA
Snap OPS to B1

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 Pn1 6 - POWER - OFF
SUIT POWER - OFF
Pn1 300 - SUIT FLOW - OFF
Disconnect O2 and comm
Pn1 300 - SUIT FLOW VLV - CABIN FLOW
Doff PGA, stow FCS, UCTA inside PGA

TO BE PERFORMED WHEN CDR DOFFS PGA:

CDR Pn1 9 - POWER - OFF
SUIT POWER - OFF
Pn1 301 - SUIT FLOW - OFF
Disconnect Comm and O2
Pn1 301 SUIT FLOW VLV - CABIN FLOW
Doff PGA, stow FCS, UCTA, inside PGA
Connect lt wt headset as req'd
Pn1 9 - POWER - AUDIO
SUIT POWER - on (up)

CMP/LMP doff biomed harness (if desired),
stow in TSB
CDR reconnect biomed harness for transmission
of data to ground

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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

02 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 02, elec, comm cable,
and couch hook

Remove EVA sta 02 gage, place in EVA bag,
(Wrist Tether pouch)

Install dust caps: Elec (2), 02 (1) on Pnl 603

Install QD on Pnl 603

Connect Umb dust caps and lock

Stow Umb in umb bag

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Stow the following in EV bag

PCV - Press valve pouch
Purge vlv - 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

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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

Pn1 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 pn1 603 guard, stow.

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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

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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

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CONTINGENCY EVA

BACK

COLOR _____

X
4-2

- 15 Disconnect PGA bag and stow under
LMP couch
- 16 Stow RHC 1 in F1
- 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 02 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 02 vlv - CLOSED
Pnl 601 - Verify REPRESS 02 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)

CONTINGENCY EVA

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2 PREP FOR CABIN DEPRESS

Don PGA

Verify L O2 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, O2 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 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

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

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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
02 FLOW HI LT may come on
prior To CABIN PRESS REG lock up
- 2 At 3.25 psia, SIDE HATCH DUMP vlv - CLOSE
- 3 02 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 02 FLOW HI Lt - OFF

3 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
A11 - OFF

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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

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VAC TRANSFER TO CM ECS

(If 25 minutes elapsed from
OPS start time, perform the following)
C and R SUIT FLOW vlv - 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 - REPRESS 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

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4-7

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)

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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 02 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 02
hoses to CMP
CMP Connect C 02 hoses to CDR PGA (red to red, blue to
blue)
CDR Close purge vlv
C SUIT FLOW vlv - adjust for comfort
OPS 02 - OFF

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-LMP (PLSS)-

CDR Verify R SUIT FLOW vlv - 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 vlv (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 vlv - CLOSE
- 2 Pnl 326 - REPRESS 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

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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 O2 connector
CDR SUIT FLOW vlv (3) - FULL FLOW
PLSS PUMP - OFF
PLSS FAN - OFF
PLSS MODE SEL - POS 0
Verify PRIM/AUX feedwater - CLOSE

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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 O2 - OFF
Verify OPS O2 actuator stowed
Disconnect OPS O2 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 O2 and H2O hoses
Disconnect lower, then upper, PLSS straps-Doff PLSS
Stow PLSS-O2, H2O, and COMM umbilicals
Temp stow PLSS

END OF PLSS - OPS EVT
(Go To FINAL SYSTEMS CONFIG) (X/4-16)

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X
4-12

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).

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4-13

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 O2 hose and Purge vlv
Connect O2 hoses to PGA (red/red, blue/blue)
C-CDR, R-LMP
SUIT FLOW vlv - adjust for comfort
PLSS O2 - 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)

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CABIN REPRESS - (DECAL) - EVT

- 1 SIDE HATCH DUMP vlv - CLOSE
- 2 Pnl 326 - REPRESS 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)

-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 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 (red/red, blue/blue)
C SUIT FLOW vlv - adjust for comfort
L SUIT FLOW vlv - increase for comfort
PLSS PUMP - OFF
PLSS FAN - OFF

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-LMP-

Remove LEVA
Remove interconnect from R 02 hoses
LMP 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 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)

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PLSS/OPS DOFFING

Remove waist tethers, lifeline, and stow in TSB
All RCU ELEC CNTLS - OFF
Disconnect RCU stow in TSB
Disconnect PLSS O2 and H2O hoses
Disconnect lower then upper PLSS straps-Doff PLSS
Stow PLSS-O2, H2O, and COMM umbilicals
Stow OPS-02 Actuator and O2 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 O2 - CLOSE
Pnl 326 - REPRESS PKG vlv - FILL
Pnl 602 - Verify Repress O2 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 O2 pressure 865-935 psi
Pnl 600 - EMERGENCY O2 vlv - CLOSED
Pnl 601 - REPRESS O2 vlv - CLOSED
Pnl 326 - Verify SURGE TANK vlv - ON
Pnl 2 - CRYO PRESS IND-SRG/3
Verify surge tank pressure 865-935 psi

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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)

PGA 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)

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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
- 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

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

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4-19

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)

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CABIN REPRESS (DECAL)

- 1 SIDE HATCH DUMP vlv - CLOSE
- 2 Pnl 326 - REPRESS 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

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)

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8 EVT EQUIPMENT STOWAGE FOR ENTRY

I. CM entry without suits:

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

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II. CM entry with suits:

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

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

<u>ITEM</u>	<u>STOWAGE LOCATION</u>
a. Film Magazines	Vol R13, A8
b. Log Books	Vol R1, R2 and R3

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X
5-

DATE 9/29/72

NO.	ITEM 	ACTION	BACKOUT

REAL TIME
CHECKLIST

BACK

COLOR _____

X
5-

NO.	ITEM 	ACTION	BACKOUT

DATE 9/29/72

REAL TIME
CHECKLIST

DATE 9/29/72[illegible]

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NO.	ITEM 	ACTION	BACKOUT

DATE 9/29/72



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Undocking, LM Ejection

16MM PHOTO LOG



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A diagram showing a horizontal line with a dashed vertical line extending upwards from its left end. A circle is centered on the horizontal line, and a shaded sphere is positioned to its right, tangent to the circle at a point on the horizontal line.

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A diagram showing a sphere resting on a horizontal dashed line. A vertical line passes through the center of the sphere, extending both above and below it.

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70 MM
CAM TYPE

PHOTO LOG

X
6-11

MAG	KK
ASA	64

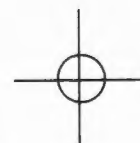
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REMARKS
(f, t, LENS, FILTER)

Earth Photo, Orbital Science, Undocking

70MM PHOTO LOG



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