NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

APOLLO 17

ALL LAUNCH DATES

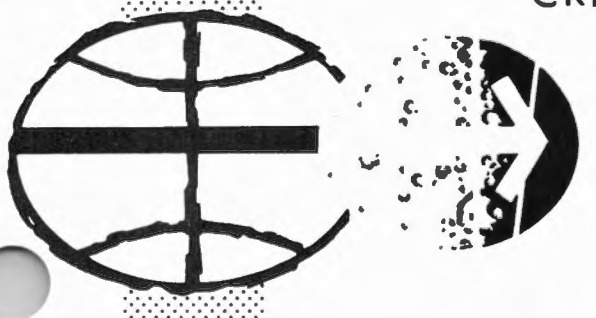
CHANGE A

CSM EXP/EVA CHECKLIST

PREPARED BY

EVA & EXPERIMENTS BRANCH

CREW PROCEDURES DIVISION



MANNED SPACECRAFT CENTER

HOUSTON, TEXAS

NOVEMBER 8, 1972

APOLLO 17

CSM EXP/EVA CHECKLIST

NOVEMBER 8, 1972

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ACKNOWLEDGMENT

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Apollo 17

CSM EXP/EVA CHECKLIST

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* Current change

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* Current Change

** 10 pages

3 PRE-SPS BURN PREP
LASER ALTM - OFF
ANTS, CAMR, & COVERS - RETR
LOGIC PWR (2) - OFF
SM/AC PWR - ON (Pnl 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)
IR - OFF
UV SPECT - OFF
SM/AC PWR - OFF (Pnl 181)
S-BD AUX TV - off (ctr) (Pnl 3)
DATA SYS ON - OFF

6 KILL PWR
NONESS BUS - OFF (Pnl 5)

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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

When RADAR ON and OPERATE sw in 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)

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9 SCIENTIFIC DATA SYSTEM PREP

PCM BIT RATE - HIGH (Pnl 3)
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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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) - DPLY/RETR
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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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)

Note: For auto coil failures of A3(+P) or B3(+Y), jets C3(+P) or D3(+Y) may be enabled to retain auto control.

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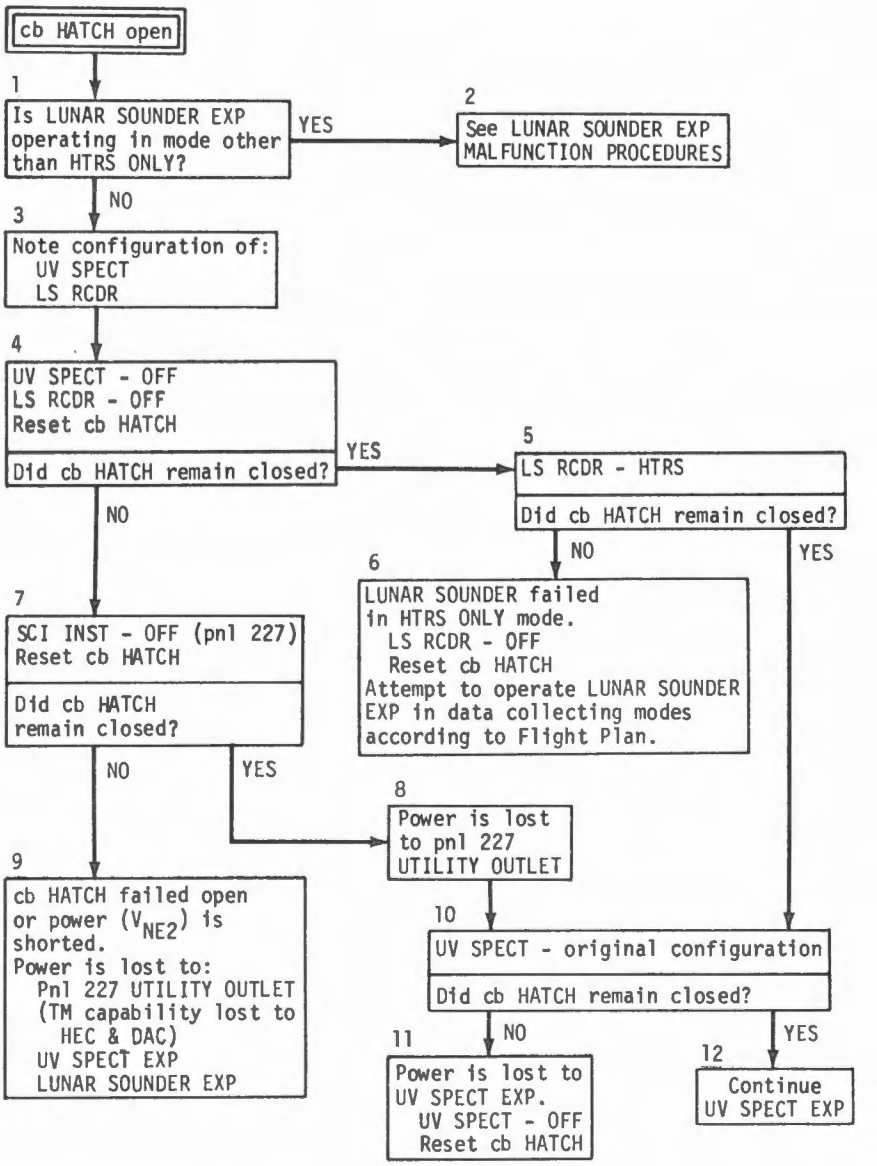
INSTRUMENTS SCI EQUIP
HATCH



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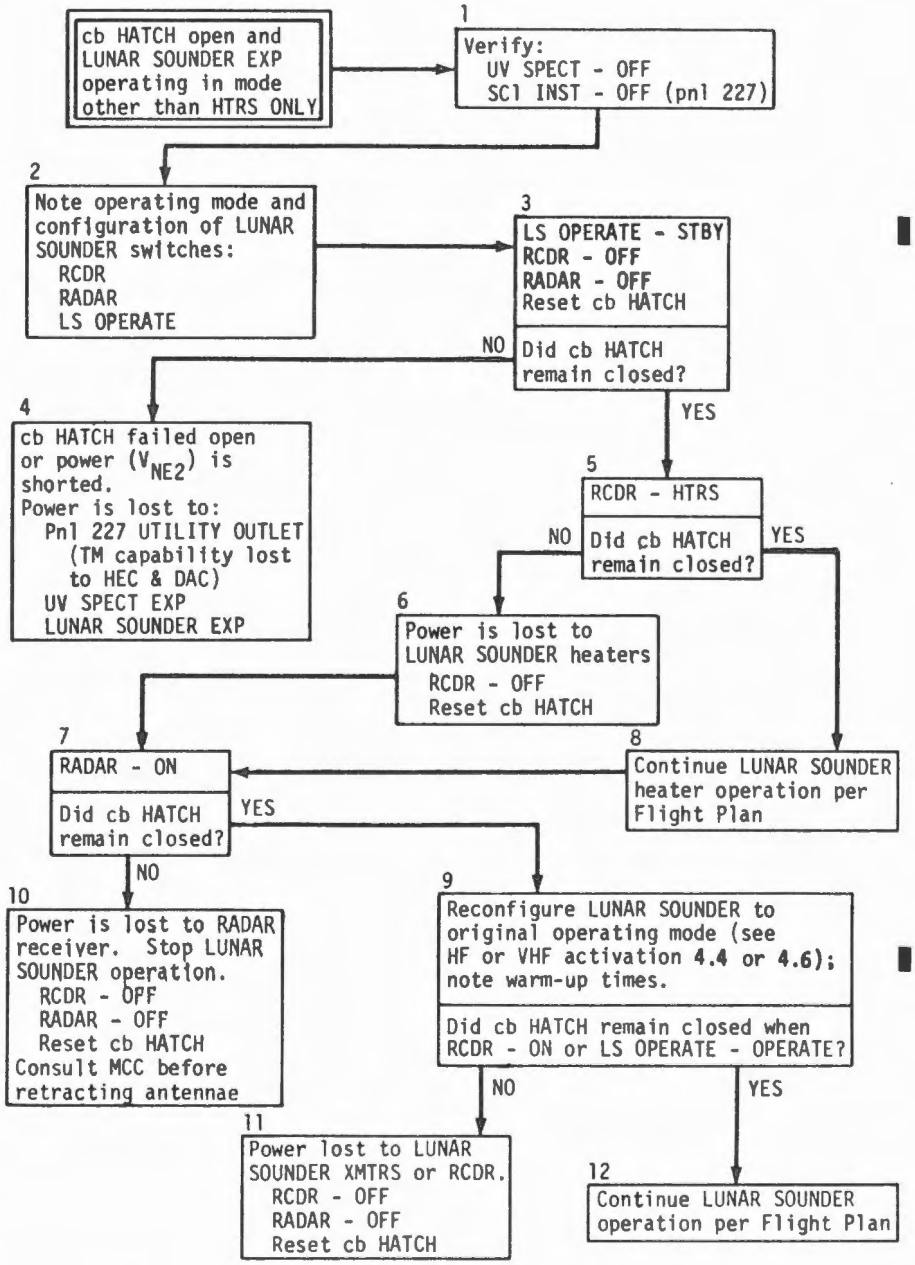
LUNAR SOUNDER EXP
MALFUNCTION PROCEDURES



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1 ALFMED (GET 68)

Review ALFMED Experiment Notes

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" and record GET)

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CM
EXPERIMENTS

At end of experiment (after 60 min):
Doff blindfolds
ALFMED PWR sw - OFF (Give verbal "MARK" and record GET)
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)

CM EXPERIMENTS

ALFMED EXPERIMENT NOTES

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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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2-31

CREWMAN		TIME	EYE		TYPE OF EVENT				LOCATION IN VISUAL FIELD	REMARKS
CDR	CMP		L	R	STREAK/DIRECTION		STAR	CLOUD	OTHER		

DATE _____

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
FDAI scale - 5/1
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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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
step 3.

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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
19:00 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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BIOMEDICAL URINE SAMPLING SYSTEM (BUSS)

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
Connect sample container to BUSS with mating halves
Fill sample container by squeezing BUSS
Squeeze urine from sample container to BUSS, agitate 5 sec with sample container collapsed
Assemble constraint over sample container
Refill sample container (until tight against restraint)
Disconnect sample container

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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

Note: Do not dump last BUSS used by each crewman. Stow last BUSS's (3) in fecal transfer bag.

BUSS

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DATE 9/29/72

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

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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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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

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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

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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
Stow loose items, etc.

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

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

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

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

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PGA DONNING

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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
Verify PGA zipper locked
Comm carrier - CMP TSB, Top Pkt (don later)
Remove PGA gas connector plugs and stow in EVA bag, purge vlv pouch
Conn O2 hoses to LH side R/R, B/B
PGA Diverter vlvs - as desired
Pnl 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
- Verify PGA zipper locked
- 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 O2 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

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CDR PGA donning:
- FCS - inside PGA
- CWG - CMP TSB
- Biomed harness - on crewman/CMP TSB
- UCTA - inside PGA
- Verify PGA zipper locked
- 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

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Conn O2 hoses blue to red for cooling
Conn comm
Pnl 301 - Suit Flow - full flow (If reqd)

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 O2 - ON
Verify EVA STA O2 gage reads approx same as
surge tank press (approx 900 psig)
SCU - OPEN
Verify flow and purge umbilical
Pnl 603 - EVA STA O2 - OFF

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

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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)

X
3-11

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

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	CDR/LMP
1. UMB (02)	1. COMM
2. Elec	2. 02
3. PCV	3. Gas conn plugs
4. Purge vlv	
5. OPS	
6. SCU - OPEN, locked	

Pnl 9 - MODE - VOX
VOX SENS TW - ADJUST

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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 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

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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)

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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),
temp stow if desired
CMP - adjust PGA tiedown strap
Set wrist rings to engage position

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— 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 O2 - 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 O2 - 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)

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Pnl 603 - EVA Sta O2 - 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

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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 verify handle locked in detent
- 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

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Retrieve Pan Camera Cassette
- Remove hard and soft covers
- Attach hook and lock
- Pull pip pin, squeeze handle and remove cassette

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 Center hoses stowed around CDR X-X foot strut, right hoses on LMP couch
4 Interconnect C & R 02 hoses
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
  (Pull Pip Pin, stow R-6 or disconnect hex with tool B)
10 MDC Ingress Bar - Stow
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 Remove PGA (PGA bag), place on LMP couch

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14 Disconnect PGA bag and stow under LMP couch
15 Stow RHC 1 in F2
16 L and R Couch - Stow foot, leg, and seat pans, 0°
17 LH X-X Strut - Connected or Disconnect and tie off
18 Stow in jettison bag:
A9 contents and partition
Misc waste
19 Unstow B5, B6
20 Prepare Jettison Bag, Secure Draw String, Tape

SYSTEM PREPARATION FOR DEPRESS

Pnl 325 - CAB PRESS REL vlv (2) - NORMAL
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 602 - Verify REPRESS O2 press 865-935 psi
Pnl 2 - CRYO PRESS - IND - SRG/3
Pnl 2 - SURGE TANK PRESS - 865-935 psi
Pnl 2 - CABIN FANS - OFF
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 O2 hoses connected Red/Red, Blue/Blue, Locked
PGA flow diverter valves (2) (as desired)
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
Unzip fecal bags (2)
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 CYCLE SUIT CKT RETURN VLV
8 AT 4.0 PSID DIR O2 - CLOSE
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
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

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

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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
Purge vlv to LO (as req'd)
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
Purge vlv to LO (as req'd)
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 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 - 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-

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

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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)

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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 O2 - OFF
Verify OPS O2 actuator stowed
Disconnect OPS O2 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
Purge vlv to LO (as req'd)
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

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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 O2 - OFF

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 02 FLOW <.4
5 SUIT TEST PRESS
6 DIR 02 - OPEN
7 CYCLE SUIT CKT RETURN VLV
8 AT 4.0 PSID DIR 02 - CLOSE
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

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CABIN DEPRESS (DECAL) - EVT

1 SIDE HATCH DUMP vlv - OPEN
  (02 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 02 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 02 FLOW HI LT - OFF

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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

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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

NASA — MSC

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)

DATE_____ DATE 11/8/72

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 R-6)
(g) Stow meter covers (4 EVA bag, A2)