NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

*(JULY 26 LAUNCH)

APOLLO 15

LM-10

CHANGE B

LUNAR SURFACE CHECKLIST

PREPARED BY

EVA PROCEDURES SECTION

EVA/IVA PROCEDURES BRANCH

CREW PROCEDURES DIVISION

MANNED SPACECRAFT CENTER

HOUSTON, TEXAS

JULY 14, 1971

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APOLLO 15

LM LUNAR SURFACE CHECKLIST

JULY 14, 1971

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It is requested that any organization having comments, questions, or suggestions concerning this document contact Dan Bland, EVA/IVA Procedures Branch, CG31, Building 4, room 216, telephone 483-4637.

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

Distribution of this document is controlled by Flight Data File Manager, T. W. Holloway, Flight Planning Branch, Crew Procedures Division.

ACKNOWLEDGEMENT

AREA	NAME/BRANCH	LOCATION
Lunar Surface Timeline (Pg. a - f)	Spencer H. Gardner Flight Planning CG52	Ext 4271 Bldg 4 Rm 232
Section 1,12,19,20,21	T. H. Kaiser Systems Procedures CG22	Ext 2651 Bldg 4 Rm 252
Section 2,3,5,6,8 9,11,13,18	John H. Covington EVA/IVA Procedures CG32	Ext 4637 Bldg 4 Rm 216
Section 4,7,10,14 15,16,17	Joe H. Roberts EVA/IVA Procedures CG33	Ext 3091 Bldg 4 Rm 219
Section 22	J. G. Olmsted EVA/IVA Procedures CG33	Ext 3091 Bldg 4 Rm 219
EMU Malfunction Procedures	R. S. Millican EVA/IVA Procedures CG32	Ext 4637 Bldg 4 Rm 216

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

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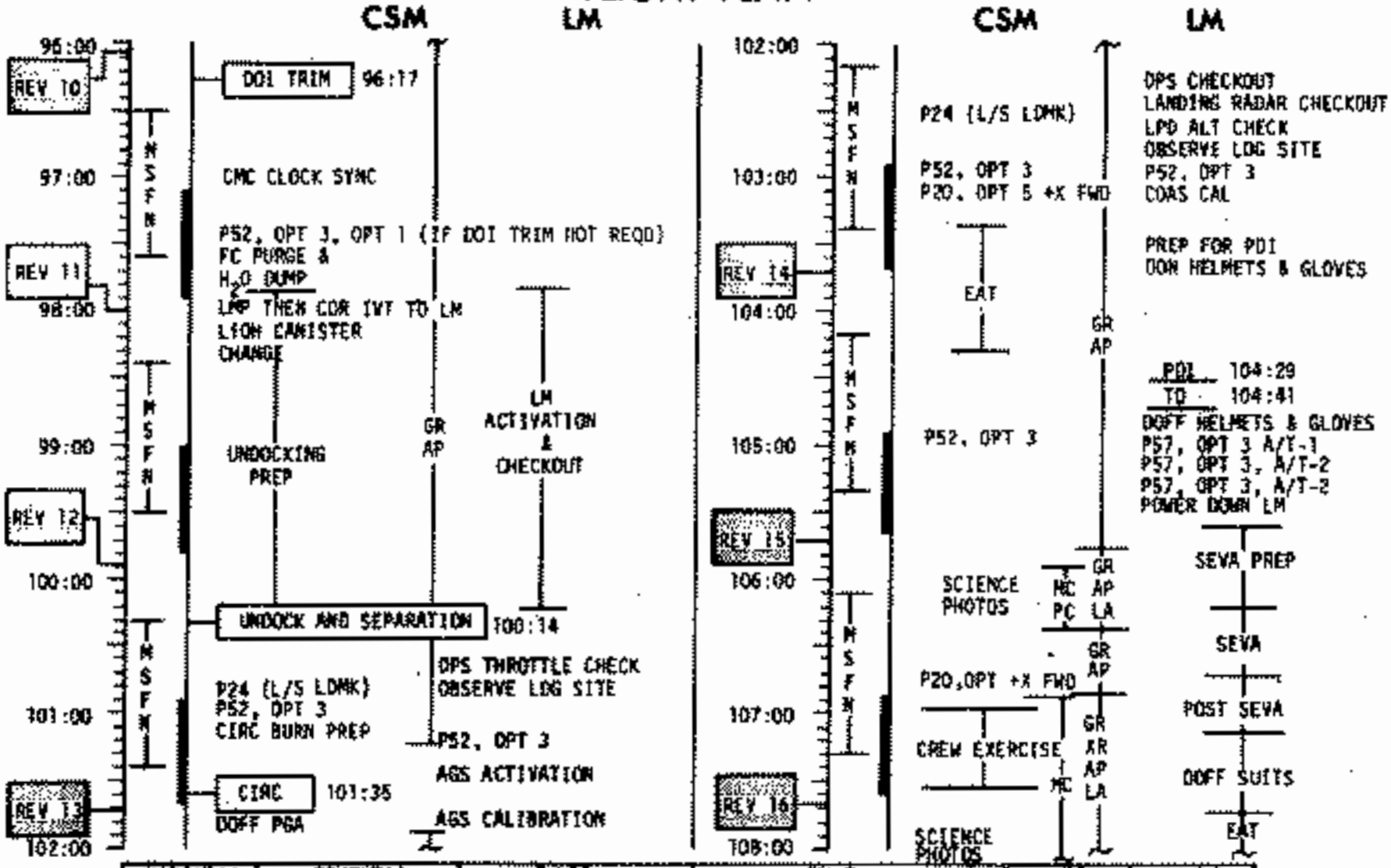
DATE

DATE 6/30/71

FLIGHT PLAN

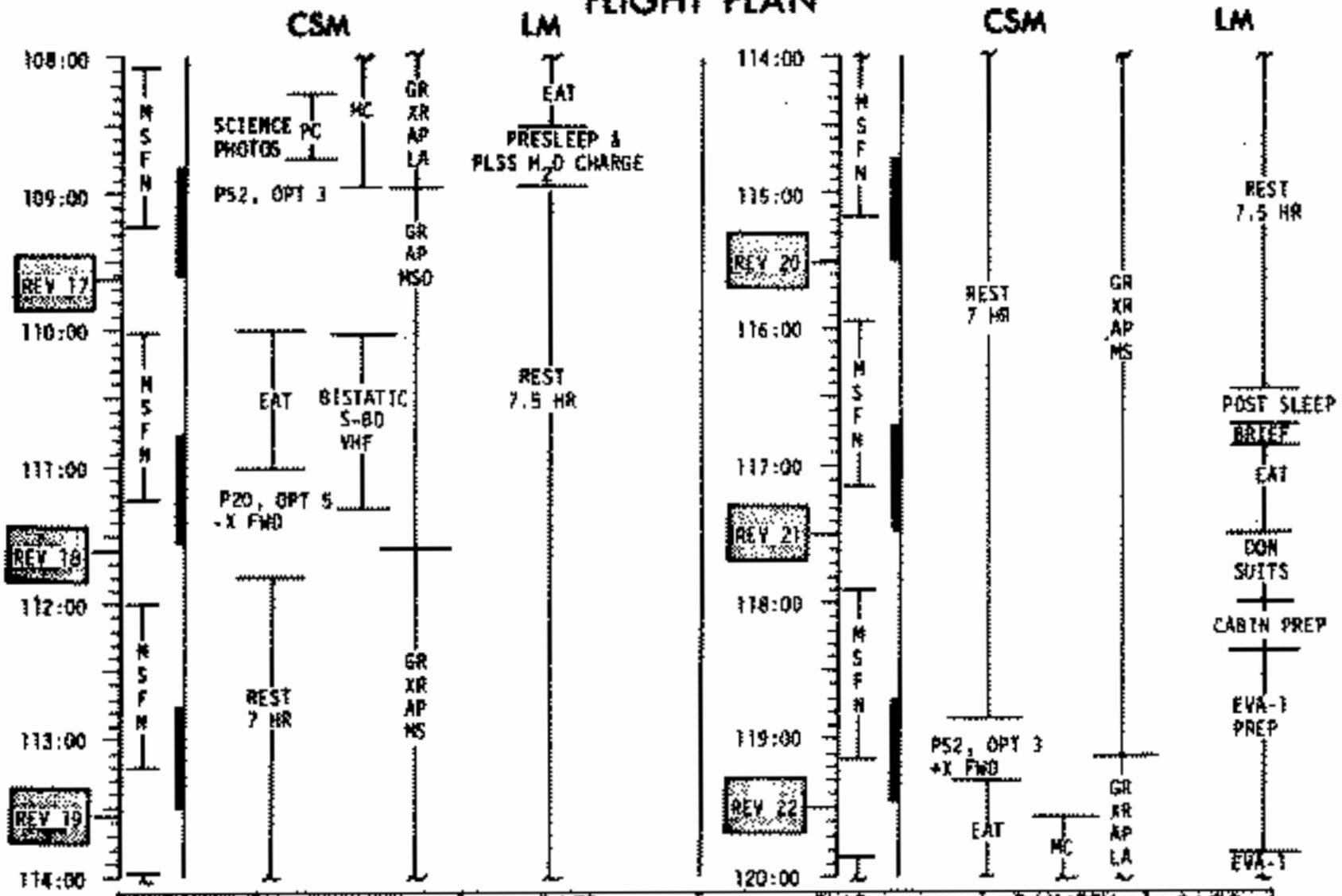


MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 15	FINAL (7/26)	6/21/71	96:00 - 108:00	5/9 - 16	5 - 9

FLIGHT PLANNING BRANCH

a

FLIGHT PLAN



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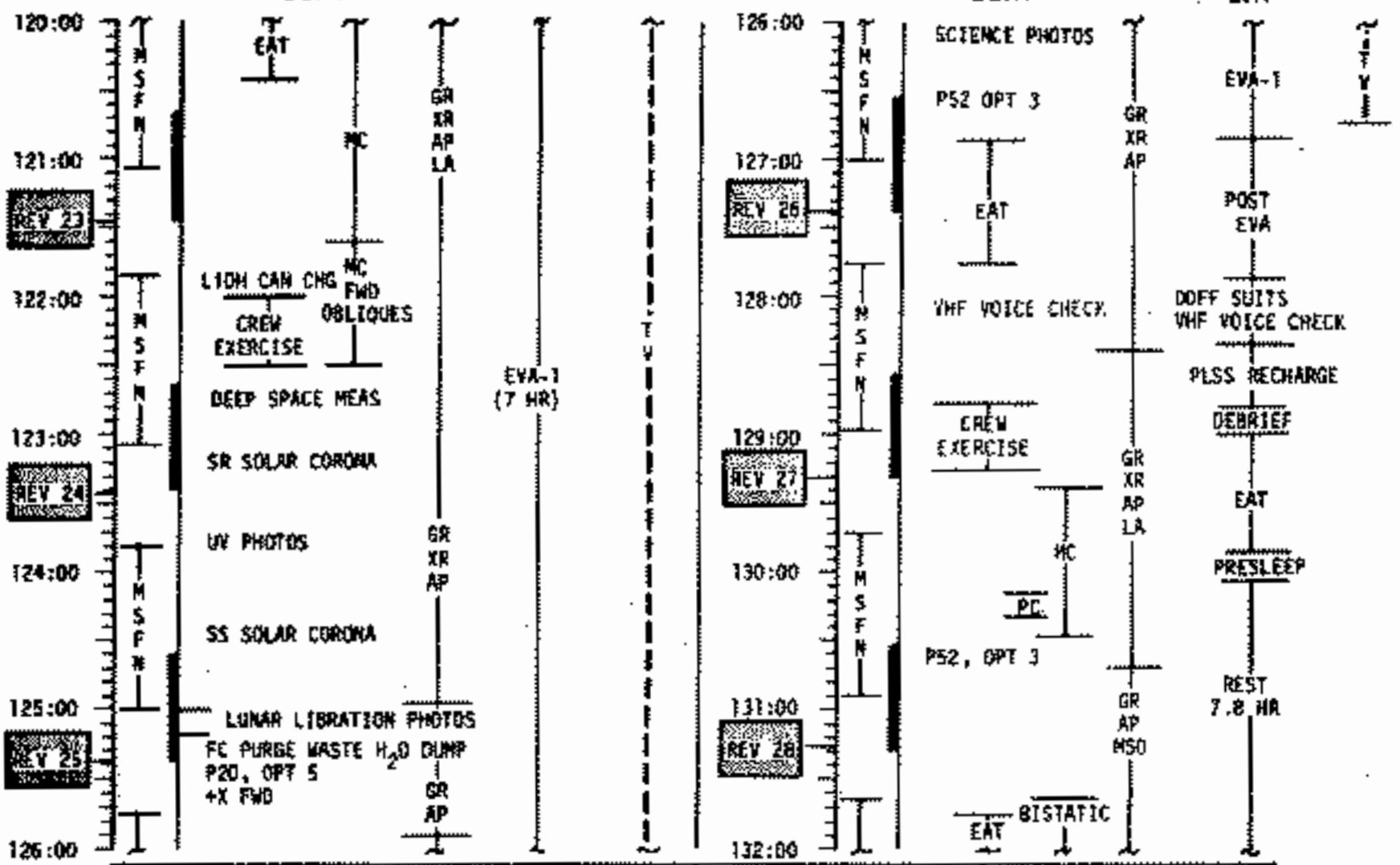
FLIGHT PLANNING BRANCH

b

DATE 6/30/71

DATE 6/30/71

FLIGHT PLAN



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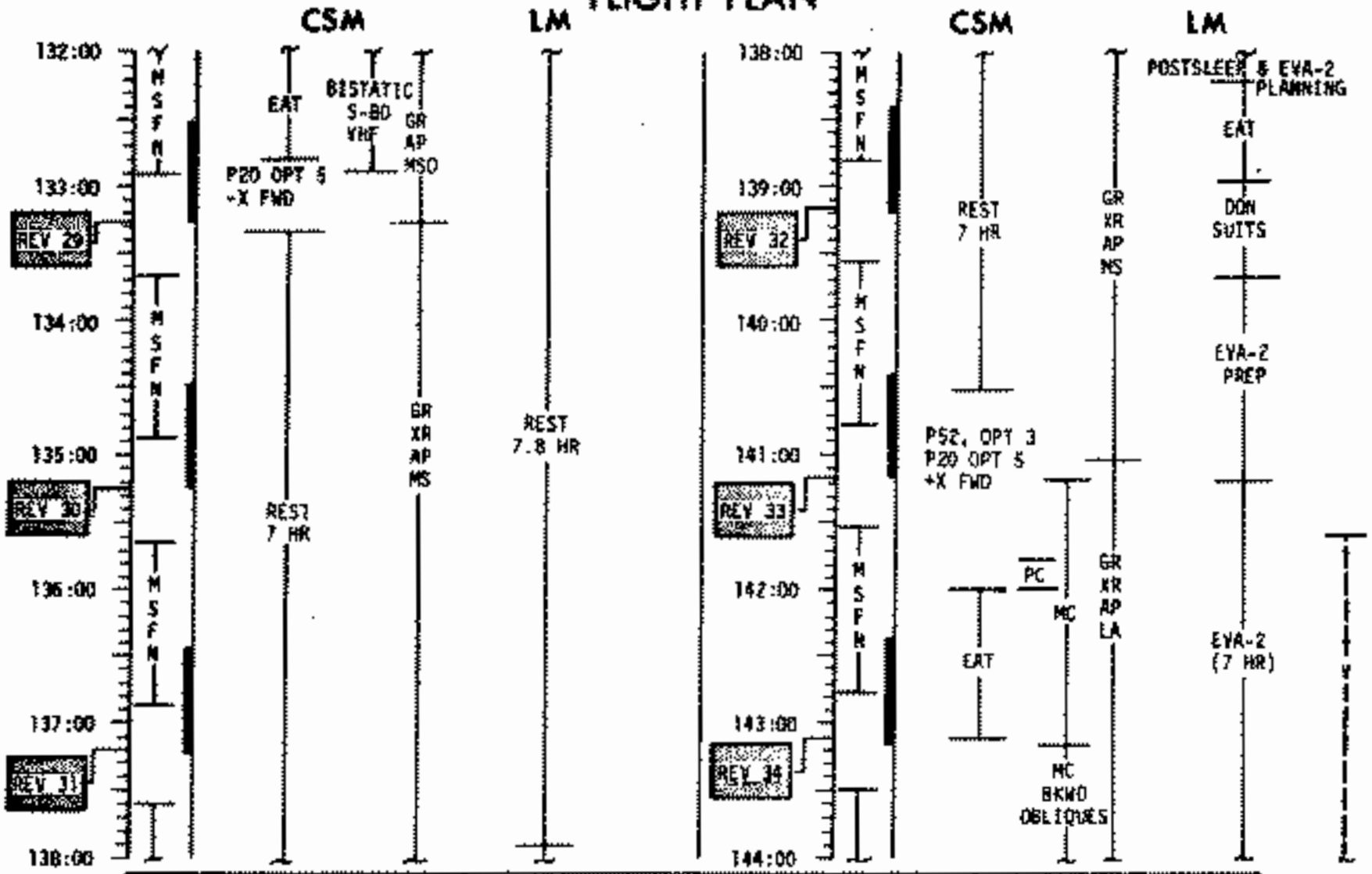
FLIGHT PLANNING BRANCH

C

FLIGHT PLAN



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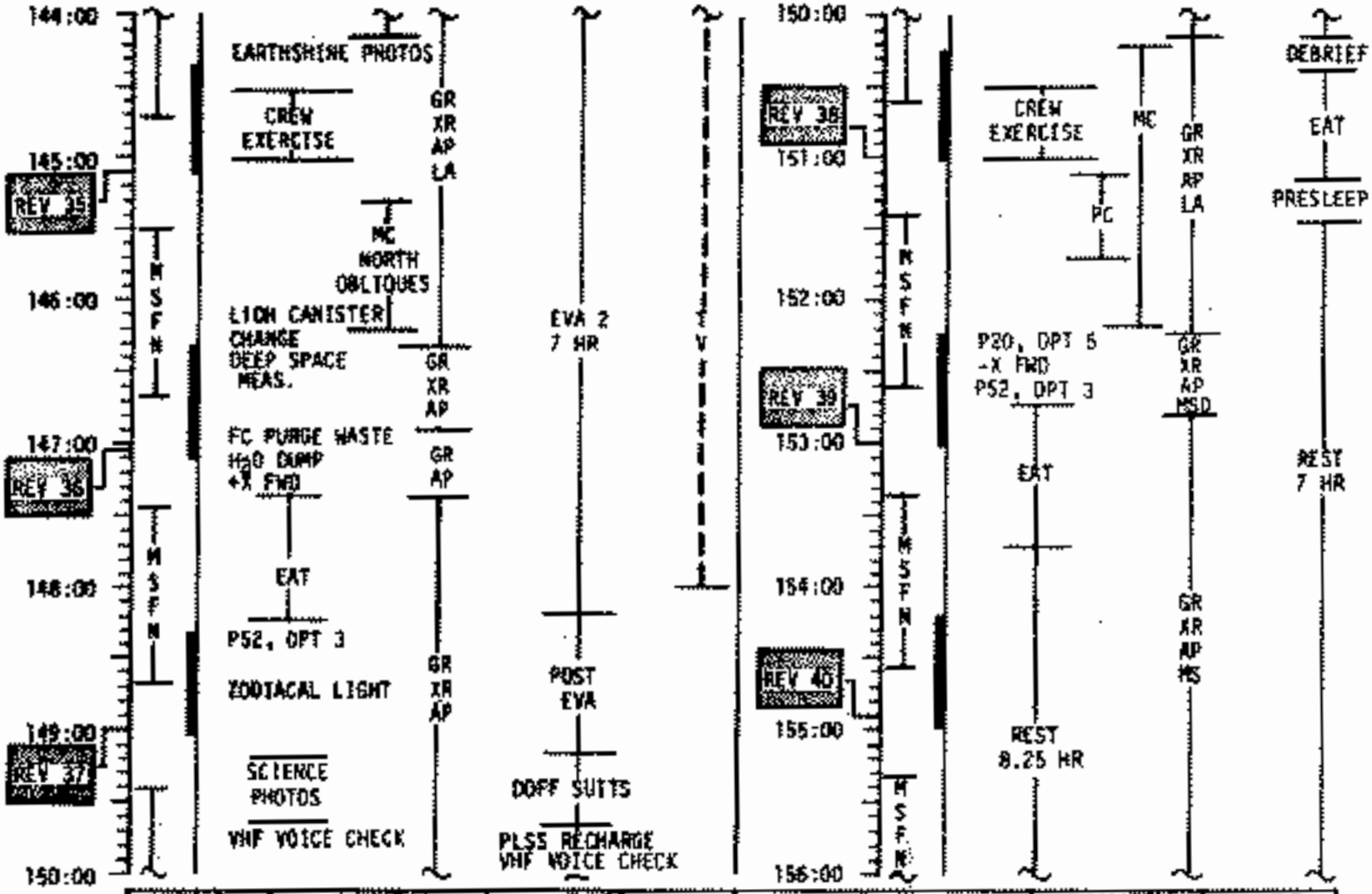
FLIGHT PLANNING BRANCH

d

DATE 6/30/71

DATE 6/30/71

FLIGHT PLAN



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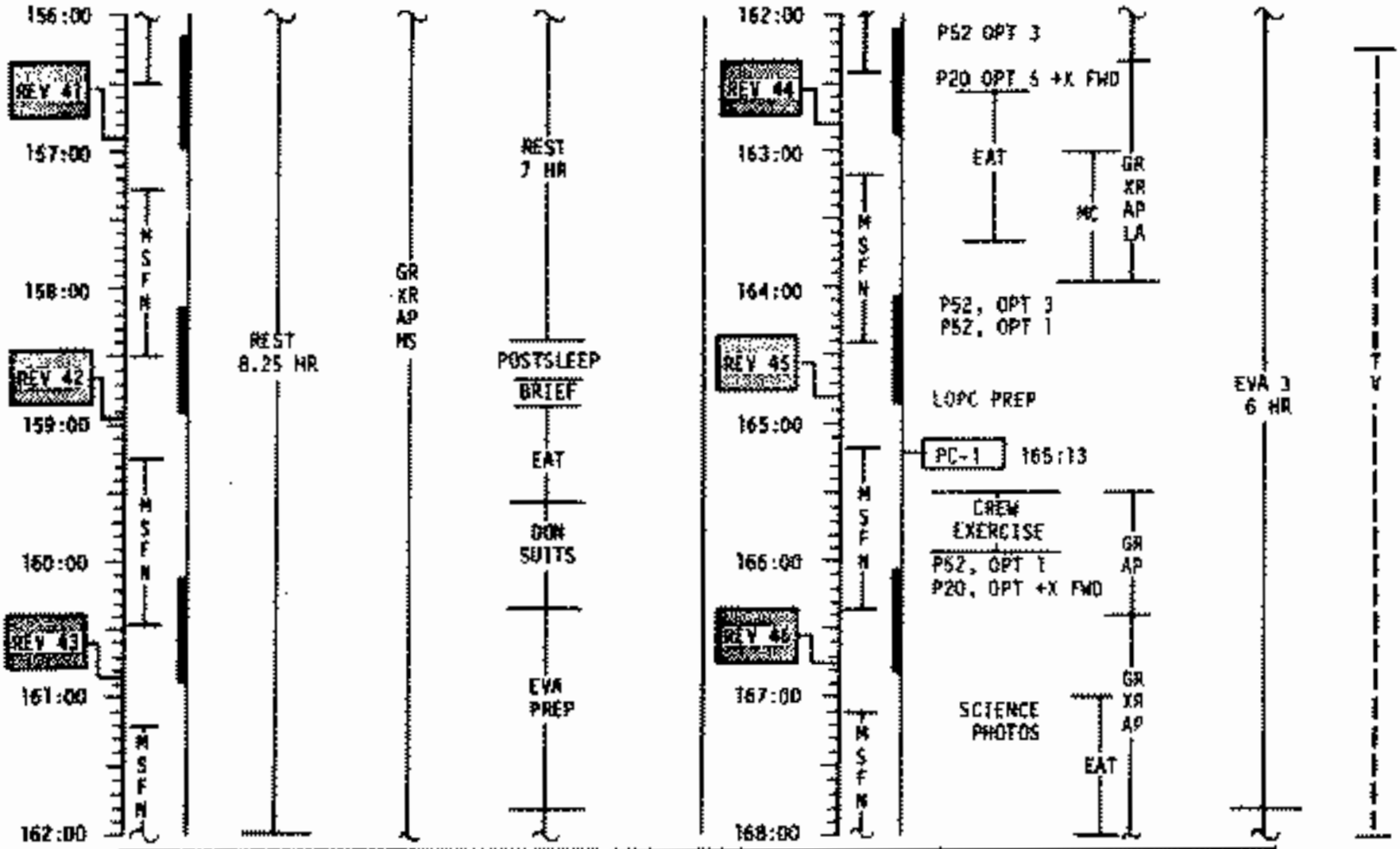
FLIGHT PLANNING BRANCH

e

FLIGHT PLAN



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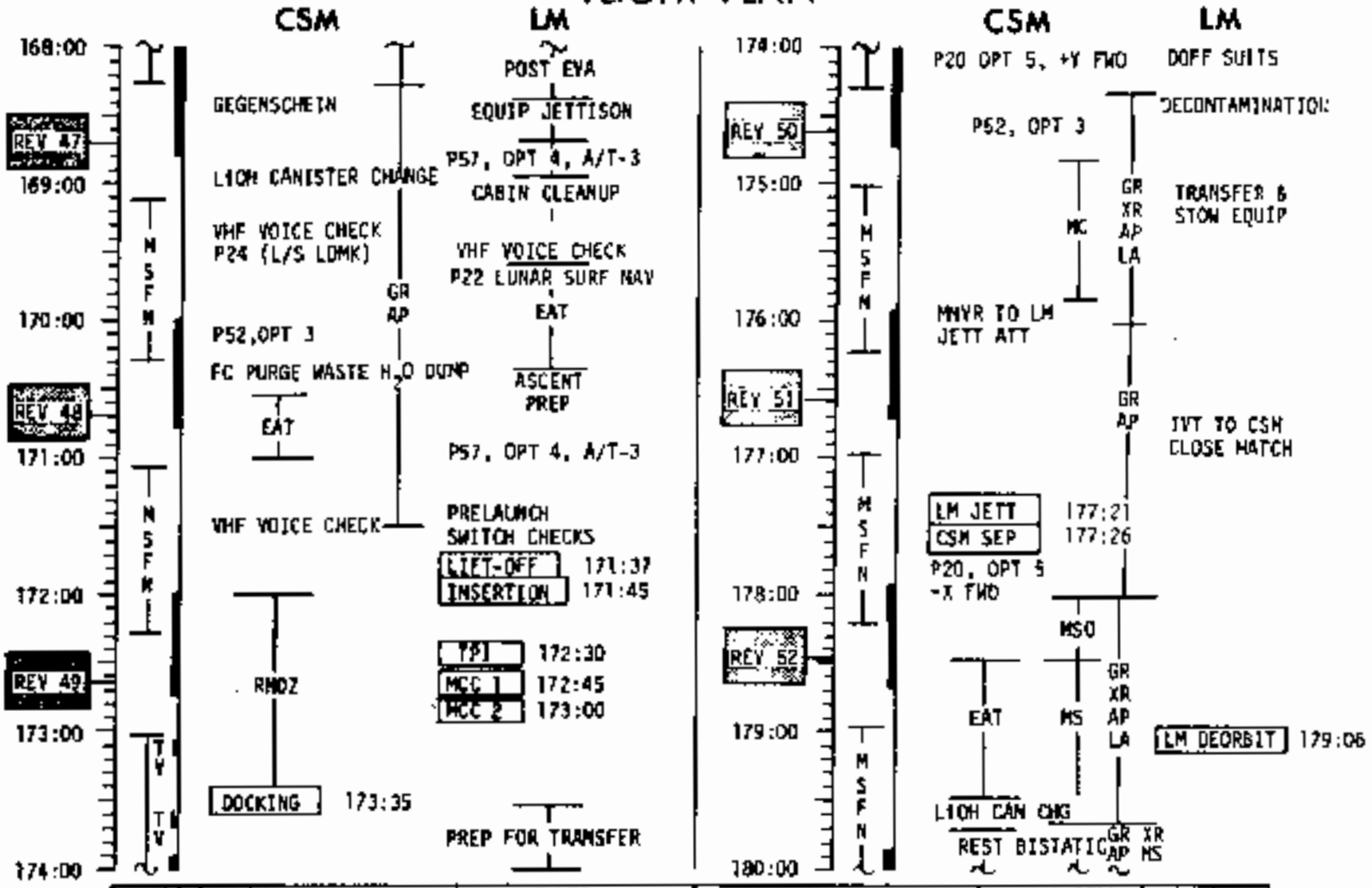
FLIGHT PLANNING BRANCH

f

DATE 6/30/71

DATE 6/30/71

FLIGHT PLAN



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FLIGHT PLANNING BRANCH

DATE 6/30/71

********** PDI +20 (104:49) **********

PRPLNT TEMP/PRESS MON - DES 1, 2
DES He REG 1 - CLOSE; tb(2)-bp
OXID & FUEL VENTS - OPEN; tb(2)-gray
MASTER ARM - ON
DES VENT - FIRE
MASTER ARM - OFF
Monitor OXID Press Until 20 to
  40 psi, then OXID VENT - CLOSE
(Monitor FUEL Press Until <8 psi)

MODE CONTROL (2) - ATT HOLD

Verify INV - 2 Selected
CB(11) INV 1 - Open
  DECA PWR - Open

CB (16) ASC ECA CONT - Close
BAT 5,6 - OFF/RESET, tb - bp
INVERTER - 2
CB(16) PQGS - Open
  DES ENG OVRD - Open
  ASC ECA CONT - Open
  CWEA - Open Then Close (DES REG Lt - Off)

Verify Cabin Press
PRESS REG A&B - CABIN
SUIT GAS DIVERTER - Pull/EGRESS
CABIN GAS RETURN - EGRESS
CABIN REPRESS - AUTO
SUIT ISOL (2) - SUIT DISC

Doff Helmet & Gloves
Reverse O2 Hoses R/B, B/R
PGA Diverter Vlvs - IV (Horz)
SUIT ISOL (2) - SUIT FLOW
Remove & Stow Restraints (CDR's To Floor Fittings)

V16 N20E
  Record _____ OG (.01°)
  _____ IG
  _____ MG

047 R _____ Sin Az (To MSFN)
053 R _____ Cos Az (To MSFN)
544 R _____ X Gyro Coeff (.01°/hr)
545 R _____ Y Gyro Coeff
546 R _____ Z Gyro Coeff

FIRST REV ACT

P57E, R2 00003, PRO
N06 00010
00001
00110
PRO (NO ATT Lt - On/Off, Twice)
N04 Nav. Err. (.01°)
V32E (NO ATT Lt - On/Off, Twice)
N04 Nav. Err. (.01°)
PRO
N22 ICDU Angles (.01°)
PRO (NO ATT Lt - On/Off)
N05 Angle Diff (.01°)
PRO
N93 Torq. Angles (.001°)
V34E, POOE

When FUEL Press < 8 psi:
FUEL VENT - CLOSE

400 + 6 Calib Gyros
224 + 58118E
226 + 58118E
662 + 0E
673 + 0E
400 R (+0 Calib Complete In 5m 2s)

VHF - OFF, OFF, OFF, OFF
AUDIO (Both): VHF A&B - OFF
S-BD P&Y SET (+73/-62), SLEW
P _____ Y _____
Peak Until > 3.9

544 R _____ X Gyro Coeff (.01°/hr)
545 R _____ Y Gyro Coeff
546 R _____ Z Gyro Coeff

If Gyro Drift Changes >2.0°/hr AGS Failed

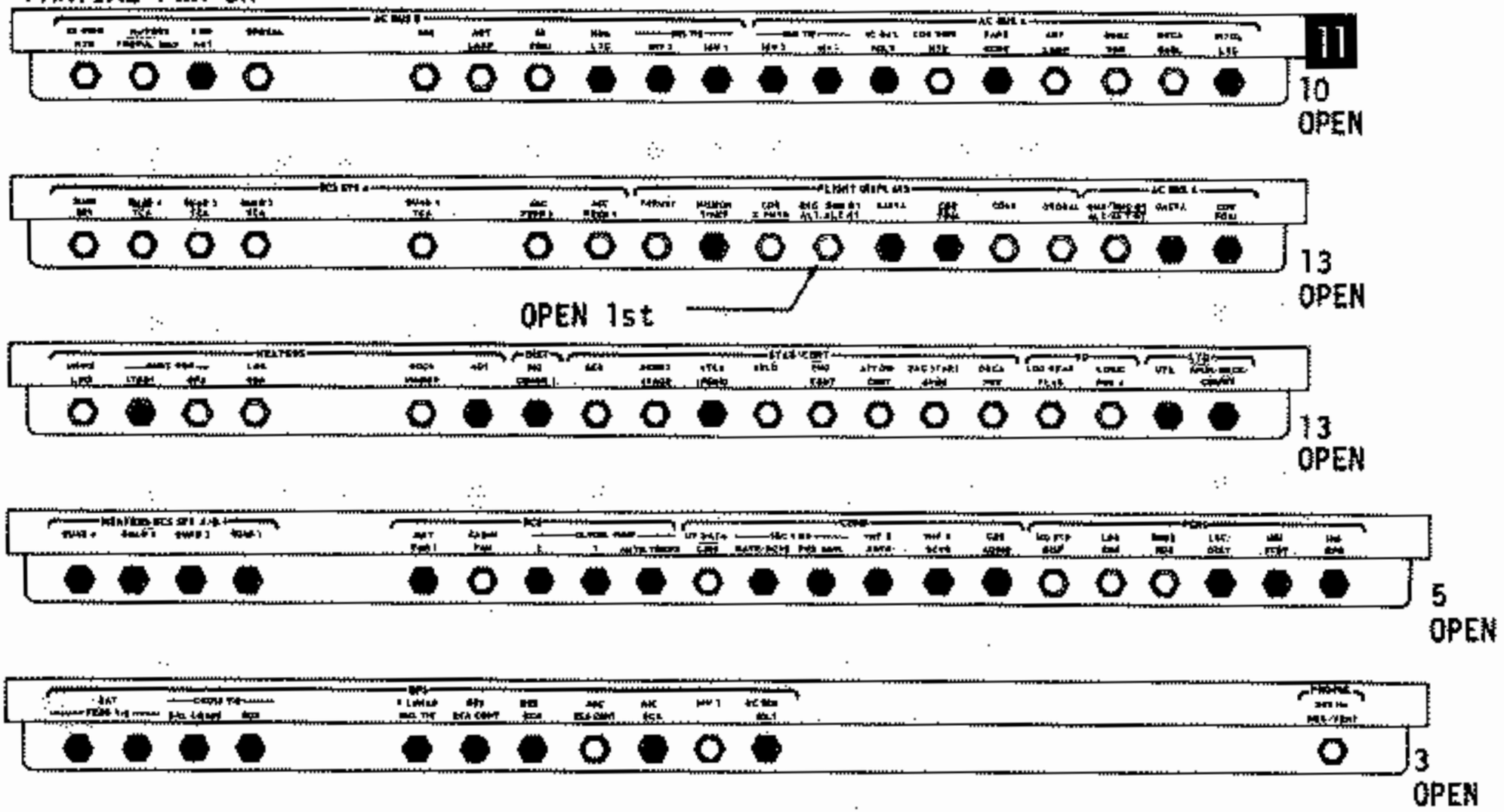
Window Shades - Close

Configure CB's per PARTIAL PWR DN Charts &
Reset CES AC & CES DC Warn Lts.

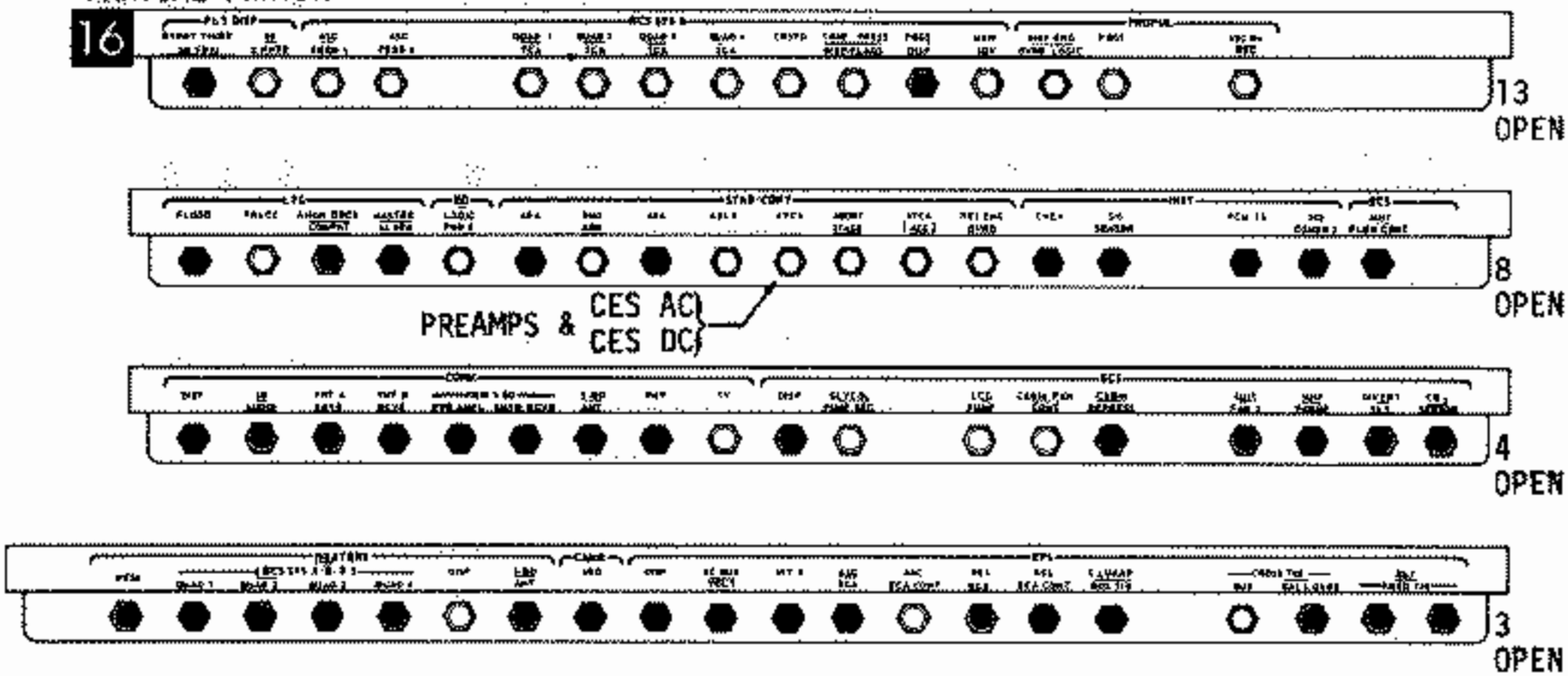
DATE 7/14/71

DATE 5/10/71

PARTIAL PWR ON



PARTIAL PWR DN



DATE 5/10/71

DATE 6/30/71

********** PDI +:45 (105:14) **********

1st

CB(11) AOT LAMP - Close
P57, R2 00003, PRO
N06 00010
00002
00110
PRO
N71 1st Star, 4 Marks (611 Aldebaran)

N71 2nd Star, 4 Marks (343 Deneb)

N05 Angle Diff. (.01°)
PRO
N93 Torq. Angles (.001°)
PRO
N25 00014, ENTR
N89 Lat (.001°)
Long/2 (.001°)
Alt (.01 nmi)
Consult MSFN:
(UPDATE RLS) PRO
(TERM) V34E
P00E

CB(11) RR (2) - Close
V41 N72E (+00000, +28300)
N12 R2 00002, PRO
V16 N72E
CB(11) RR (2) - Open
V44E

Record Time
___:___:___:

2nd

P57, R2 00003, PRO
N06 00010
00002
00110
PRO
N71 1st Star, 4 Marks (201)
(Alpheratz)
N71 2nd Star, 4 Marks (612)
(Rigel)
N05 Angle Diff. (.01°)
PRO
N93 Torq. Angles (.001°)
PRO
N25 00014, ENTR
N89 Lat (.001°)
Long/2 (.001°)
Alt (.01 nmi)
Consult MSFN:
(UPDATE RLS) PRO
(TERM) V34E
P00E, V40N20E
CB(11) AOT LAMP - Open

Notify MSFN of E-DUMP
TLM-HI (Verify)
V74E (42 sec)

400 +3 AGS/PGNS Align
413 +1 Store Azimuth
047 R _____ Sin Az
053 R _____ Cos Az

STAY/NO STAY From MSFN

To Be Performed 10 min After P00E
P06E
CB (11) IMU OPR - Open
PRO (Hold In Until STBY Lt-On)

342 + 0E
CB(16) AEA - Open
(M.A., AGS Warn Lt - On)
AGS STATUS - STBY
CB(16) AEA - Close (AGS Lt - Off)

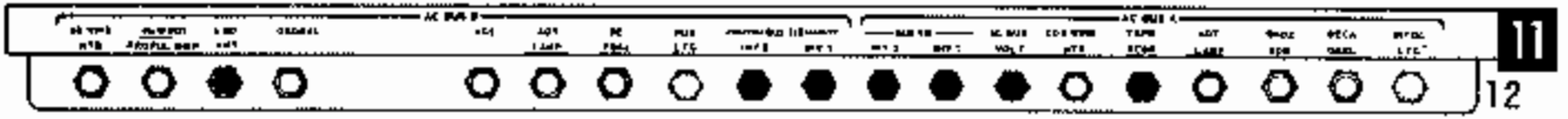
Window Shades - Open
POWER/TEMP MON - ED/OFF
Check ED VOLTS, A _____, B _____ (To MSFN)
POWER/TEMP MON - LUN
BAT 3 - OFF/RESET, tb-bp
BAT L (CDR) - ON; tb - CDR
BAT 4 - OFF/RESET; tb-bp
POWER/TEMP MON - Check Bus Volts

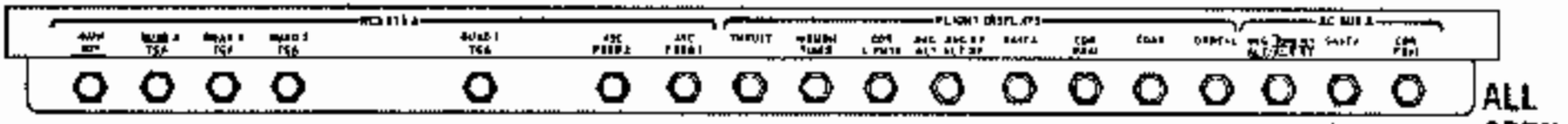
Configure CB's Per PWR ON Charts

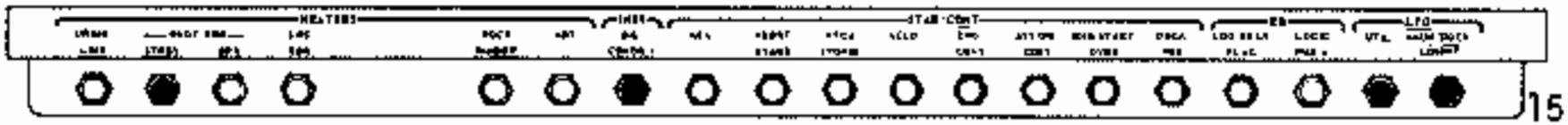
DATE 6/30/71

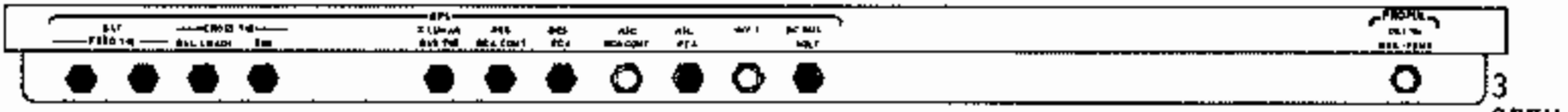
DATE 5/10/71

PWR DN & EVA



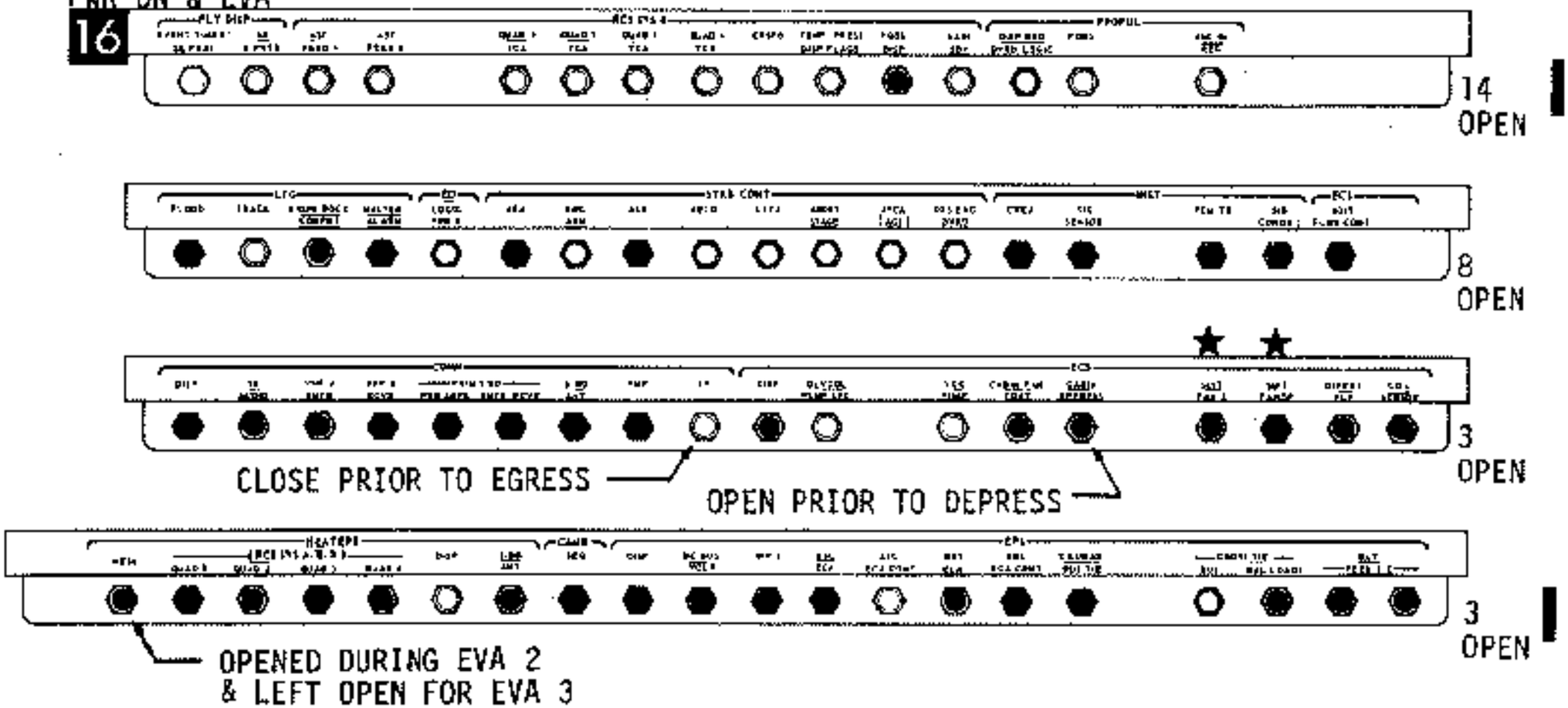






PWR DN & EVA

16



★ —— OPEN FOR EVA

DATE 6/30/71

DATE 6/30/71

POWERDOWN SWITCH CONFIG.

FDAI 1&2 - INRTL
EARTH/LUNAR - PWR OFF
LTG - OFF
MODE - HOLD/FAST
ALT SET - 35

FUEL & OXID VENT tb-bp
MESA - HI
URINE LINE - OFF
MASTER ARM - OFF
ASC He SEL - BOTH
STAGE - SAFE (guarded)

S BAND T/R - T/R
ICS T/R - T/R
RELAY - OFF
MODE - ICS/PTT
AUDIO CONT - NORM
VHF A - RCV
VHF B - OFF
COAS - OFF

TTCA (CDR) - JETS (Dn)

Eng STOP - Reset
Eng START - Reset

TMR CONT - START
OVERRIDE ANUN - OFF
OVERRIDE NUM - OFF
OVERRIDE INTEGRAL - OFF

X-POINTER SCALE (CDR) - HI MULT
RATE/ERR MON (CDR) - LDG RDR/CMPTR
ATTITUDE MON (CDR) - PGNS
GUID CONT - PGNS
MODE SEL - PGNS
RNG/ALT MON - RNG/RNG RT
SHFT/TRUN - ±50°
RATE SCALE - 25°/SEC
ACA PROP (CDR) - ENABLE
THR CONT - AUTO
MAN THROT - CDR
ENG ARM - OFF
ATT/TRANSL - 4 JETS
BAL CPL - ON
ABORT - Reset
ABORT STAGE - Reset (Guarded)
PRPLNT QTY MON - OFF
PRPLNT TEMP/PRESS MON - ASC
HELIUM MON - PRESS 1

RR GYRO SEL - PRIM

TEMP/PRESS MON - OXID MANF
ACA PROP (LMP) - ENABLE
GLYCOL - PUMP 1
SUIT FAN - 1
O2/H2O QTY MON - DES 2
RATE/ERR MON (LMP) - RNDZ RADAR
ATTITUDE MON (LMP) - AGS

ENG GMBL - ENABLE
DES ENG CMD OVRD - OFF
LDG ANT - AUTO
RDR TEST - OFF
TEST MONITOR - AGC
SLEW RATE - LO
RR MODE - SLEW

DEAD BAND - MIN
ATTITUDE CONTROL (3) - MODE CONT
MODE CONTROL (2) - ATT HOLD
TEMP MON - RNDZ RDR
RCS SYS A/B-2 QUAD 1,2,3,4 - AUTO
X-POINTER SCALE (LMP) - HI MULT
EXTERIOR LTG - OFF
FLOOD - OFF

ACA/4 JET (2) - ENABLE
TTCA/TRANSL (2) - ENABLE

TTCA (LMP) - JETS (Dn)

Eng STOP - Reset
AGS STATUS - STBY

POWER/TEMP MON - CDR BUS
INVERTER - 2
UP LINK SQUELCH - OFF
UP DATA LINK - OFF

AUDIO CONT - NORM
S BAND T/R - T/R
ICS T/R - T/R
RELAY - OFF
MODE - ICS/PTT
VHF A - RCV
VHF B - OFF
S BAND MODULATE - PM
XMTR/RCVR - SEC
PWR AMPL - OFF
VOICE - VOICE
PCM - PCM
RANGE - RANGE

VHF A XMTR - OFF
VHF A RCVR - ON
VHF B XMTR & RCVR (2) - OFF
BIOMED - LEFT
TLM - HI
RECORDER - OFF

DATE 6/30/71

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VHF - AFT
TRACK MODE - SLEW
S BAND - SLEW

PRESS REG A&B - CABIN
CABIN REPRESS - AUTO
LO PLSS FILL - CLOSE
DES O2 - OPEN
#1,#2 ASC O2 - CLOSE
SUIT ISOL (2) - SUIT FLOW
SUIT CIRCUIT RELIEF - AUTO
CABIN GAS RETURN - EGRESS
SUIT GAS DIVERTER - Pull/EGRESS
CO2 CANISTER SEL - PRIM
PRIM & SEC CO2 CANISTER - CLOSE
WATER SEP SEL - PUSH/SEP 1
ASC H2O - CLOSE
SEC EVAP FLOW - CLOSE
PRIM EVAP FLOW No. 2 - CLOSE
DES H2O - OPEN
PRIM EVAP FLOW No. 1 - OPEN
WATER TANK SELECT - DES
HI PLSS O2 FILL - CLOSE

CABIN RELIEF & DUMP (2) - AUTO & Locked

CWEA STATUS: CAUTION: PREAMPS

Copy Liftoff Time In Data Book
For Rev 16 thru 20

Unstow SEVA Cue Card
Stow Sun Compass On CDR's Comm Panel

STANDUP EVA

EQUIPMENT PREP

Empty UCTA's (HTR)
Check PGA Zippers, Verify Lock-Lock
PGA Relief Valve Cap In Pkt
Empty PGA Pkts In Purse
Verify Watch On PGA

Stow Armrests
Stow COAS In Fwd Window Mount
Stow LEVA Bags On Floor,1 Left,1 Right

Unstow PLSS On Floor, Set Against Hatch
Install Helmet Bag
Stow Sleep Restraints Under CDR'S PLSS
Attach LMP's PLSS Strap (Bot ISA PKT)

Secure ISA Over RCU Shelf
Transfer Ancillary Stowage Container
(Aft LHSSC) To Jett Bag Compt Aft OPS
Stow 3 Jett Bags (4-Aft OPS) In LHSSC
Hang 1 Jett Bag From CDR'S LH Handhold

Configure 500mm Lens Camr(Aft Eng Cvr):
Remove Tape From Camr & Lens
Install 500mm Lens
Stow Reseau Cover, Tape, Loose Padding
In Jett Bag
Install B&W Mag MM (Fwd RHSSC)
Stow Dark Slide In Mag Pkt
Install Trigger, RCU/Camr Brkt,
Then Handle
Install Ring Sight
Stow 500mm Lens Camr In Purse

Stow Camr Bag In Jett Bag
Stow LM Mag Bag In LCG Compt (RHSSC)

Verify 70mm Camr Configured, Mag LL
Installed & Stowed In Camr Compt

Apply Antifog (LMP LEVA bag), Wipe Dry
With Tissue (LHSSC)
Stow EMU Maintenance Kit In purse
Stow LEVA's, Helmets & EV Gloves On
Eng Cover
Stow LEVA Bags Under OPS

Audio (CDR & LMP):
MODE - VOX
VOX SENS - As Reqd

Comm Check With Each Other And Hou

HELMET/GLOVE DONNING

LM O2 Hoses, R/R & B/B
Position Mikes (Both)
Don Helmets
Don LEVA's

Verify The Following:

Helmet & Visor	(1)	- Aligned & Adjusted
O2 Connectors	(2)	- Locked
Connector Plugs	(2)	- Locked
COMM Connectors	(1)	- Locked
PGA Diverter Vlv	(1)	- Horizontal

Don EV Gloves & Verify

Wrist Locks	(4)	- Locked
Glove Straps	(4)	- Adjusted

PRESS INTEGRITY CHECK

NOTE: LM Suit Circuit Shall Not Be Maintained At Elevated Press >5 Min

SUIT GAS DIVERTER - PULL-EGRESS (Verify)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS Reg B - DIRECT O2
Monitor Cuff Gage To 3.7 - 4.0 Psig Then PRESS REG B - EGRESS (Cuff Gage Decay <.3 Psig In 1 Min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt Press Decays To 4.8 Psia)

DATE 5/10/71

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CABIN DEPRESS FOR SEVA

Confirm Go For DEPRESS From Hou
CB(16) ECS: CABIN REPRESS - Open
Ovhd Or Fwd Dump Valve, OPEN Then AUTO At 3.5 Psia
(Verify Cabin Press 3.5 Psia & LM Suit Circuit Lockup At 4.3 Psia & Decaying)

Ovhd Or Fwd Dump Vlv - OPEN (Verify LM Suit Circuit 3.6 To 4.3 Psia)

HATCH OPENING

Partially Open Ovhd Hatch
Ovhd Or Fwd Dump Valve - AUTO
Ovhd Hatch - Full Open & Latched

CDR Sit On Eng Cover, Facing Fwd
Unlock Drogue, Rotate CW To Release

NOTE: LMP Block Direct Sun Impingement On Instrument Panels

Lower And Pitch Drogue Fwd 90°
Hand Drogue To LMP
Stow Drogue In CDR's Station

CDR Stand On Eng Cover

SEVA

Identify Landmarks For LM Location

Shoot 360° Stereo Pan With 60mm Lens (22 FR)

Check Traverse Routes For Landmarks Trafficability & ALSEP Location

Check Far Field Geology:
- Front
- Rille
- North Complex
- Mare
- Boulder Fields

Shoot 500mm Lens Photography (Lens Cover To Camr, Velcro)

Check Near Field Geology:
- Affects of Descent Engine
- Fragment Distribution
- Craters
- Boulders
- Soil

Confirm Best ALSEP Location

HATCH CLOSING

CDR Sit On Eng Cover, Facing Fwd
LMP Hand Drogue To CDR

Install Drogue, Rotate CCW To Stop, & Lock

Ovhd Hatch - Close & Lock

CABIN REPRESS

Dump Valves (Both) - AUTO (Verify)
CABIN REPRESS - AUTO (Verify)

CB(16) ECS: CABIN REPRESS - Close
MASTER ALARM & CABIN Warning Lt - On
Verify Cabin Press Increasing
PRESS REG A & B - CABIN

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psia

POST SEVA SYSTEMS CONFIGURATION

Doff Gloves, Stow On Comm Panel
Doff Helmets With Visors, Stow In Helmet Bag
Verify Safety On Dump Valve

LM O2 Hoses, R/B & B/R

Audio (CDR & LMP):
MODE - ICS/PTT

VOICE - DN VOICE BU

POST SEVA CABIN CONFIGURATION

Install Lens Cover On 500mm Lens, Verify

Disconnect BSLSS Bag, Stow Under Purse

DATE 6/30/71

Unstow Lunar Surface Checklist, 2-5
Stow SEVA Cue Card

107:11 DOFF SUITS (30 MIN)
(1945)

TLM BIOMED - OFF

* * * * CDR 1st: * * * *
Empty UCTA (HTR)
SUIT ISOL - SUIT DISC
AUDIO CB - OPEN

DOFF PGA
Unstow Headset (LHSSC), Stow
  Comm Carrier
Stow LM O2, H2O & Comm
Install PGA Elect Connector Cap (Aft RHSSC)
Disconnect Bio Belt & UCTA
Close Inner & Outer Zippers
Attach Neckring Cover (Aft RHSSC)
Stow On Eng Cover, Neck Aft &
  CDR On RH, Face Up
  LMP On LH, Face Down
Install One Glove
Stow UCTA For Drying

DRY PGA
Connect LM O2 Hoses, R/B & B/R
CABIN GAS RETURN - AUTO
SUIT GAS DIVERTER - PUSH - CABIN
SUIT ISOL - SUIT FLOW For ~60 Min, Then
  Configure ECS For Sleep

DON ICG (ICG Bag, LHMS)
Don CWG Adapter & Headset
Connect Bio Belt (Only CDR Data Reqd)
  & Headset To Adapter

Connect LM Comm
Audio CB - CLOSE
Verify Comm

LMP Repeat DOFF SUITS * * * *

TLM BIOMED - LEFT

LM CONSUMABLES UPDATE

GET 107:11 CDT 1945

RCS A	% ( )	____	B	( )	____
O2 DES	1% ( )	____	2	( )	____
O2 ASC	1% ( )	____	2	( )	____
H20 DES	1%( )	____	DES 2(	)	____
H20 ASC	1%( )	____	ASC 2(	)	____
AMP-HR DES	( )	____	ASC	( )	____

108:22 5 MIN Before Transfer
(2056)
CB(11)HTR: URINE LINE - Close
HTR CONT: URINE LINE - HTR I

EAT PERIOD
107:41 TO 108:26
2015 TO 2100

Configure ECS For Sleep

Stow LM O_2 Hoses, R/R & B/B

SUIT ISOL (BOTH) - SUIT FLOW
CABIN GAS RETURN - AUTO (Verify)
SUIT GAS DIVERTER - PUSH - CABIN (Verify)
Install Other Glove On PGA's

PRESLEEP (30 MIN)

Fold LMP's PGA Legs Over PGA Back
Stow LCG's (LCG Bag) Aft Eng Cover
Stow Sleep Restraints On PGA's
Secure Bag Under CDR's PLSS

DATE 7/14/71

PLSS H2O CHARGE

CAUTION: DO NOT USE PLSS DECAL

* * * * CDR 1st: * * * *
PLSS AUX H2O - OPEN
Connect WMS To PLSS H2O DRAIN
LM DES H2O - CLOSE
Connect LM H2O To PLSS H2O FILL
LM DES H2O - OPEN 3 Minutes
LM DES H2O - CLOSE
Connect WMS To PLSS PRIM Vent
LM DES H2O - OPEN
Monitor PRIM Sight Glass,
  Verify Gas Expelled - 25 Sec Max
LM DES H2O - CLOSE
Connect WMS To PLSS AUX Vent
LM DES H2O - OPEN
Monitor AUX Sight Glass,
  Verify Gas Expelled - 20 Sec Max
LM DES H2O - CLOSE
Disconnect And Stow WMS Hose
LM DES H2O - OPEN 5 Sec,
  LM DES H2O - CLOSE
PLSS AUX H2O - CLOSE
Disconnect And Stow LM H2O Hose

Stow PLSS Connector Covers
Set LMP PLSS On Mid-Step
LMP Repeat H2O CHARGE * * * *

LM DES H2O - OPEN
Set LMP PLSS Against Hatch

HTR CONT: URINE LINE - OFF
CB(11) HTR: URINE LINE - Open

Unstow ETB (BSLSS Bag)
Stow BSLSS In ETB
Stow 500mm Lens Camr In ETB
Stow 70mm Camr In ETB

Stow Bag Dispenser Bkts (Camr Compt,
  RHSSC) In ETB
Stow 2-HCEX Mags KK, NN & 1-B&W Mag OO
  (Aft RHSSC) In ETB
Stow 3-16mm Mags CC, DD, EE (RHSSC)
  In ETB

Stow EVA 1 Maps, 1:25,000 EVA 2 Map, Horizon/Return Chart, Rover Schematic, Map Holder & LRV Checklist (Aft FDF) In ETB
Stow Sun Compass (CDR's Comm Panel) In ETB
Attach LEC (Fwd RHSSC) To ETB
Stow ETB Fwd Corner LMP's Station

Stow PLSS Tool Harnesses (BSLSS Bag) Behind CDR's PLSS
Stow BSLSS Bag Behind LMP's Fwd Restraint Cables

Disconnect 3 Armrests, CDR LH, LMP RH & LH, Stow In Jett Bag

Clip Page 3-3 Over AOT

CREW STATUS REPORT

	CDR	LMP
MED	_____	_____
PRD	_____	_____

Report Status of PLSS H20 Charge

Unstow CDR's Hammock, Place On Suits
Unroll LMP's Hammock

LMP: Attach Straps To LH & RHSSC
Adjust Strap Tension LHSSC
Route Inboard Center Support Strap Under LMP & CDR Comm Cables, Attach To Vertical Handhold, ECS Module

Attach Outboard Center Support Strap To Lower ISA Fitting, Position Sleep Restraint, Straddle/Ingress

CDR: Attach Aft Straps -Z27
Route Hammock Under Comm Cable
Attach Fwd Straps, Panel 1 & 2
Adjust Strap Tension

Attach Outboard Center Support Strap To Horizontal Handhold, ECS Module
Position Sleep Restraint
Ingress Hammock
Attach Inboard Center Support Strap To PLSS Donning Station, Upper Outboard
Adjust Tension

DATE 7/14/71

DATE 7/14/71

Stow RCU's In LCG Bag (LHMS)
Attach Aft ISS Hooks
Deploy LM EVA Antenna

REST PERIOD
108:56 TO 116:25
2130 TO 0459

POSTSLEEP (15 MIN)

Crew Awake - Verify CWEA Status
Caution: PREAMPS
Stow Hammocks, Roll Up With
Sleep Restraints

Change LM ECS LiOH Cart
Stow Used Cart In Jett Bag

STAY/NO STAY FOR EVA 1 PREP

CREW STATUS REPORT

	CDR	LMP
MED	____	____
PRD	____	____

Copy Liftoff Time In Data Book
For Rev 21-27

LM CONSUMABLES UPDATE

GET 116:40 CDT 0514

RCS A	% ( )	____	B	( )	____
O2 DES	1% ( )	____	2	( )	____
O2 ASC	1% ( )	____	2	( )	____
H2O DES	1%(( )	____	DES 2	( )	____
H2O ASC	1% ( )	____	ASC 2	( )	____
AMP-HR DES	( )	____	ASC	( )	____

EVA 1 PLANNING WITH HOU (10 MIN)

Update EVA 1 Cuff Checklist As Reqd

EAT PERIOD
116:50 TO 117:35
0524 TO 0609

PRO, V37E 06E, PRO
(STBY Lt - On)

DON SUITS (30 MIN)

TLM BOIMED - OFF

* * * * LMP 1st: * * * *
AUDIO CB - OPEN
Stow LM Comm Cable
Unstow Comm Carrier (LHSSC), Stow Headset
Stow Gloves On Comm Panel
Stow Neckring Cover Aft RHSSC

Fill Drink Bag (ISA Back Pkt) - Evac, Install
Install Food Stick (Food Compt)

DOFF ICG
Stow ICG In Top Boot Compt, Stow Boots
On Eng Cover

DOFF CWG
Stow CWG Adapter LHSSC
Disconnect Bio Belt Yellow & Blue Leads
Unsnap Belt & Remove
Stow CWG In ICG Bag (LHMS)

DON LCG (Aft Eng Cover)
Don UCTA
Snap Bio Belt To LCG
Connect Yellow & Blue Leads

DON PGA
Stow LCG Plug In Purse
Connect UCTA, Bio Belt & LCG
Close Zippers & Lock
Don & Connect Comm Carrier
Stow PGA Elect Connector Cap In Purse

NOTE: Do Not Connect LM H_2O To PGA If
192 PKG Lanyard Seated

SUIT ISOL - SUIT DISC
Connect LM O2 R/B & B/R, H2O & Comm
SUIT ISOL - SUIT FLOW
SUIT GAS DIVERTER - PULL - EGRESS
CABIN GAS RETURN - EGRESS
AUDIO CB - CLOSE
Verify Comm

CDR Repeat DON SUITS * * * *

TLM BIOMED - RIGHT
S-GD VOICE - VOICE

DATE 6/30/71

DATE 6/30/71

118:05 BATT MGMT
(0639)
POWER/TEMP MON - ED/OFF
Check ED Volts, A ___, B ___ (To Hou)
POWER/TEMP MON - BAT 4
BAT 4 HI V-ON; tb - gray
POWER/TEMP MON - BAT 3
BAT L (CDR) - OFF/RESET; tb - bp
BAT 3 - ON; tb - gray
BAT 2 - OFF/RESET; tb - bp
BAT L (LMP) - ON; tb - LMP
BAT 1 - OFF/RESET; tb - bp
POWER/TEMP MON - Check Bus Volts

DATE 5/10/71

T18:05 CABIN PREP EVA 1
(0639)

Stow All Loose Items Not Reqd For EVA

Unstow EVA 1 Prep & Post Card

T18:20 Stow Lunar Surface Checklist

COLLECTION WEIGHT SUMMARY (#)

EVA 1		EVA 2		EVA 3	
SRC	____	SRC	____	BSLSS/Rock Bag	____
Bag ____	____	Bag ____	____	Bag ____	____
Bag ____	____	Bag ____	____	Bag ____	____
TOTAL	____	TOTAL	____	TOTAL	____

COLLECTION BAG STOWAGE

1 - Aft Eng Cover (40#Max): Bag ____
1 - LHMS (40#Max): Bag ____
2 - LH + RHSSC (40#Max): Bags ____, ____
2 - ISA (50#Max): Bags ____, ____

DATE 6/30/71

TRANSITION TO ONE-MAN EVA

BOTH Verify/Perform-As Reqd At Time Of NO GO
- PLSS PRIM H2O - CLOSE
- Fwd Hatch Closed & Locked, Dump Vlvs - AUTO
- CABIN REPRESS - AUTO
- CB(16)ECS: CABIN REPRESS - Close (Cab Warn Lt)
- Verify Press Increasing
- PRESS REGS A & B - CABIN
- PLSS O2 - OFF @ Cabin >2.5 Psia
- CB(16) ECS: SUIT FAN 2 - Close
  - SUIT FAN ΔP - Close
- ECS Caution & H2O SEP Comp Lts - Out
- PGA Press Equal To Cabin, Use Purge Vlv If Reqd
- Cab At 5.0 psia, Doff Gloves, Helmets With Visors
- PLSS PUMP - OFF (Left)
- PLSS FAN - OFF (Left)

NO GO CREWMAN:
- PLSS MODE - 0
- Disconnect OPS O2 Hose
- Disconnect Purge Vlv, Stow In Purse
- Disconnect OPS Actuator From RCU
- Disconnect RCU From PLSS, Then PGA
- Disconnect PLSS COMM, H2O, And O2
- Doff PLSS/OPS
- AUDIO CB - Open, TLM BIOMED - OFF
- Connect LM COMM, O2, & H2O
- Audio CB - Close, Comm Sws - As Reqd

OTHER CREWMAN (As Reqd):
- Disconnect PLSS H2O
- Connect LM H2O
- CB (16) ECS: LCG PUMP - Close

BOTH Stow NO GO Equipment
- OPS - Aft Engine Cover (Discon Antenna)
- PLSS - Recharge Station (Remove All 4 Straps, Stow in LHSSC or Exchange On PLSS's If Required)
- RCU - LCG Bag (LHMS)

Unstow ONE MAN EVA PREP CARD & LUNAR SURFACE BOOK

DATE 5/10/71

LM REPRESS FAILURE PROCEDURE

CB(16) ECS: CABIN REPRESS - Open (Verify)
Verify CABIN REPRESS - AUTO
Verify PRESS REG A & B - EGRESS
Verify LM Suit Circuit 3.6 - 4.0 Psia
CB(16) ECS: SUIT FAN 2 - Close
SUIT FAN ΔP - Close
ECS Caution & H2O SEP Comp Lts - Out

Verify OPS O2 - OFF
Disconnect Purge Vlv, Stow In Purse
Disconnect OPS O2 Hose

Connect to LM ECS Hoses, R/R, B/B
SUIT ISOL - SUIT FLOW
PLSS FAN - OFF (Left)
PLSS O2 - OFF

Verify Cuff Gage 3.6 - 4.0 Psig
PGA Diverter Vlv - Horizontal
PLSS Mode - 0
Disconnect PLSS Elec From PGA

AUDIO CB - Open
Connect To LM Comm

AUDIO CB - Close
Audio (CDR & LMP)
VHF A - OFF
VHF B - OFF
MODE - ICS/PTT
RELAY - OFF

COMM:
VHF - OFF, OFF, OFF, OFF, LEFT

PLSS PRIM H2O - Close
PLSS PUMP - OFF (Left)

Disconnect OPS O2 Actuator
Disconnect RCU From PGA, Then PLSS
Stow RCU On Eng Cover

Disconnect PLSS H2O From PGA
Disconnect PLSS Red O2 Hose, Then Blue
Doff PLSS/OPS, Place on Floor
Stow OPS O2 Hoses & Actuator

As Req'd-Connect LM H2O to PGA
CB(16) ECS: LCG PUMP - Close

DATE 6/30/71

DATE 7/14/71

EQUIPMENT PREP EVA 1

Stow PGA Gas Conn Plugs In Purse
Empty PGA Pockets Into Purse
PGA Relief Valve Cap In Pkt
Verify Watch On PGA

CDR Move To Aft Cabin Area

Unstow CDR Boots, Purge Valve To Purse
CDR Don Boots
Unstow CDR OPS

Remove Pallet, Stow On Cabin Fan
Perform OPS Check
Restow OPS

LMP Move To Aft Cabin Area

Unstow LMP Boots, Purge Valve To Purse
Stow IV Gloves In Bot Boot Comp
LMP Don Boots

Unstow LMP OPS
Remove Pallet, Stow On Cabin Fan
Perform OPS Check

Stow LMP OPS On Eng Cover
Stow CSRC & Ancillary Container (Aft OPS) In LMP's PGA Pkt
Install ISS
Stow Pallets In Jett Bag

Apply Antifog (Purse), Wipe Dry With Tissue (LHSSC)
Stow EMU Maintenance Kit In Purse
Stow LEVA's & Helmets On ISS
Stow Helmet Bag

Move CDR's OPS Forward On Eng Cover
Stow ETB On Aft Eng Cover
Tie Jett Bag, Stow On Aft Engine Cover

Fwd Hatch Handle - UNLOCK

PLSS DONNING

* * * * LMP 1st: * * * *
Set PLSS On Mid-Step
Verify OPS Reg Decay
Unstow O2 Nozzle & Antenna Lead
Secure Flaps

Attach OPS To PLSS
Connect OPS Antenna Lead To PLSS
Verify Sublimator Exhausts Clear
Install PLSS Tool Harness

Unstow PLSS Straps & Hoses
Remove Elect Dust Cap, Stow In Purse
Verify AUX H2O, DIVERTER, O2, &
  PRIM H2O-OFF
Connect Battery Cable

Verify The Following Locked:
  PLSS Battery Connection
  OPS Antenna Lead To PLSS
  OPS To PLSS

Don PLSS/OPS, Lift PLSS Hoses Above
  Lower Straps

Connect PLSS O2 Hoses To PGA
Verify AUX H2O, DIVERTER, O2, &
  PRIM H2O-OFF

Connect RCU To PGA & Upper Straps
Verify RCU Controls:
  PUMP, FAN - OFF (Left) MODE SEL-0
Connect RCU To PLSS

Unstow OPS O2 Hose & Actuator, Route Hose
  Behind PGA
Connect Actuator To RCU

CDR Repeat PLSS DONNING * * * *

PLSS COMM CHECK

Verify Powerdown CB Configuration
  (White Dots Out)
COMM: MODULATE - FM
PWR AMP - PRIM
Verify Voice Comm With Hou

DATE 6/30/71

Audio (LMP)
  S-BAND - T/R
  ICS - T/R
  RELAY - ON
  MODE - VOX
  VOX SENS MAX
  VHF A - T/R
      B - RCV

COMM:
  VHF A XMTR - VOICE
      A RCVR - ON
      B XMTR - OFF
      B RCVR - ON
  TLM BIOMED - OFF
  SQUELCH VHF A&B -
    Noise Thres + 1 1/2
  RECORDER - ON
VHF Antenna - EVA
UPLINK SQUELCH - ENABLE

Audio (CDR)
  S-BAND - T/R
  ICS - T/R
  RELAY - OFF
  MODE - VOX
  VOX SENS MAX
  VHF A - T/R
      B - RCV

CB(16) COMM: SE AUDIO - Open
LMP Connect To PLSS Comm

CB(16) COMM: SE AUDIO - Close
PLSS PTT (LMP) - MAIN (Rt), Verify
PLSS Mode(LMP) - A, Wheel-CCW
  (Tone-On, Vent Flag - P,
  Press Flag - O, O2 Mom)
PLSS O2 Press Gage > 85%
LMP Comm Check With CDR And Hou

NOTE: Unstow PLSS Antenna If It
  Transmits Garbled And/Or Loses TM

CB(11) COMM: CDR AUDIO - Open
CDR Connect To PLSS Comm

CB(11) COMM: CDR AUDIO - Close
Audio (CDR)
  VHF A - OFF
  VHF B - OFF

PLSS PTT (CDR) - MAIN (Rt), Verify
PLSS Mode(CDR) - B, Blade-CCW
  (Tone-On, Vent Flag - P,
  Press Flag - O, O2 Mom)
PLSS O2 Press Gage > 85%

NOTE: Crewman In Mode B Cannot
Hear Hou

LMP Comm Check With CDR And Hou

PLSS Mode(LMP)-B, Blade-CCW(Tone-On)
PLSS Mode(CDR)-A, Wheel-CCW(Tone-On)
CDR Comm Check With LMP And Hou

PLSS Mode (Both) - AR (Tone-On)

NOTE: (AR) Wheel-Hou, Blade-EVA

Perform Comm & TM Check With Hou &
Comm Check With Each Other
Read PLSS O2 Qty to Hou

NOTE: If Comm Is NO GO With Hou
S-BAND MOD - PM
Verify Comm & TM

FINAL SYSTEMS PREP

CB(16) ECS: LCG PUMP - Close
LCG - Cold, As Reqd
CB(16) ECS: CABIN REPRESS - Close (Ver)
SUIT FAN ΔP - Open
SUIT FAN 2 - Open
SUIT FAN Sel - 2
Verify ECS Caution & H2O SEP COMP
Lts - On (∿ 1 Min)

SUIT GAS DIVERTER - PULL-EGRESS(Verify)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - AUTO (Verify)

DATE 5/10/71

OPS CONNECT

LMP 1st: # # #
SUIT ISOL - SUIT DISC
Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B
Retrieve Purge Valve (Purse)-
  Verify Closed, Lock Pin In & LO
Install Purge Valve In PGA R/R
PGA Diverter Valve - Vertical

CDR Repeat OPS CONNECT # # # #

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets With LEVA's, Check Drink
  Bag Position
Secure Tool Harness Self Doff Straps
  To LEVA's

LCG-Cold, As Reqd
CB(16) ECS: LCG PUMP - Open
Disconnect LM H2O Hose
Connect PLSS H2O Hose
Stow LM Hoses (CDR's To ECS Handhold)

Verify The Following:

Helmet & Visor	(1)	- Aligned & Adjusted
O2 Connectors	(3)	- Locked
Purge Valves	(1)	- Locked
H2O Connectors	(1)	- Locked
Comm Connectors	(1)	- Locked
PGA Diverter Vlv	(1)	- Vertical

Verify EVA CB Configuration
  (White Dots Out + EVA Decals)

Don EV Gloves & Verify:
  Wrist Locks (4) - Locked
  Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON (Rt)

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK

PLSS O2 - ON (Tone-On, O2 Flag-0)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Monitor Cuff Gage For 1 Min, Report Decay)
PLSS O2 - ON (Cuff Gage 3.7-4.0 Psig, Tone & O2 Flag May Come On)
Verify O2 Flag Clear

CABIN DEPRESS

Confirm Go For Depress From Hou
CB(16)ECS: CABIN REPRESS - Open
CB(16) Comm: TV - Close
CABIN REPRESS Vlv - CLOSE

Ovhd Or Fwd Dump Vlv - OPEN Then AUTO @ 3.5 Psia (Verify Cuff Gage Does Not Drop Below 4.6 Psig)
Verify:
Cabin At 3.5 Psia
LM Suit Circuit Lockup At 4.3 Psia
PGA > 4.6 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN
Verify:
Tone-On & H2O Flag - A (1.2-1.7 Psia)
PGA > 4.6 Psig & Decaying

Partially Open Fwd Hatch

FINAL PREP FOR EGRESS :03

PLSS PRIM H2O - OPEN (H2O Flag - Clear In About 4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient
Verify:
PGA 3.7 To 4.6 Psig
CWEA Status:
Caution
PREAMPS
ECS

H2O SEP COMP LT - ON

Lower EV Visor :10

DATE 5/10/71

DATE 7/13/71

LMP-2

EVA-1

7/1/71

EGRESS H2O XFER

PLSS TO LM H2O TRANSFER

PLSS Pump - OFF
Disconnect PLSS H2O
Connect LM H2O
CB(16) ECS: LCG Pump - CLOSE

LM TO PLSS H2O TRANSFER

CB(16) ECS: LCG Pump - OPEN
Disconnect LM H2O
Connect PLSS H2O
PLSS Pump - ON

CDR-2

EVA-1

7/1/71

EGRESS H2O XFER

PLSS TO LM H2O TRANSFER

PLSS Pump - OFF
Disconnect PLSS H2O
Connect LM H2O
CB(16) ECS: LCG Pump - CLOSE

LM TO PLSS H2O TRANSFER

CB(16) ECS: LCG Pump - OPEN
Disconnect LM H2O
Connect PLSS H2O
PLSS Pump - ON

EVA-1

H2O XFER
EGRESS

LMP - EVA 1

0+11 CDR PLSS Antenna - Deploy
Jett Bag - Place in Hatch
LEC - to CDR

Recorder - OFF
VOX SENS (2) - MAX
CB Configuration - Verify
Utility & Flood Lts - OFF

LEC - To Overhead Handhold
0+20 ETB - Transfer
LEC - Stow to Side

Egress
Hatch - Close
Descend to Surface
[CDR: LMP PLSS Ant.-Unstow]

LMP-3
EVA-1
7/1/71

H2O XFER
EGRESS

CDR - EVA 1

0+10 Move Through Hatch - Comm Ck
PLSS Antenna - Deploy
MESA - Deploy
Jett Bag - Discard
LEC - Deploy to LRV Side

Descend to Surface
FAM - 3 Minutes
Jett Bag - Under LM

0+20 ETB - Transfer Down
ETB - To Ladder Hook

MESA Height - Adjust
Blankets - Open
[LMP: Egress]
LMP PLSS Ant. - Unstow

CDR-3
EVA-1
7/1/71

DATE 7/13/71

DATE 7/13/71

LMP-4 | EVA-1 | 7/1/71

0+25 Fam - 3 minutes
Contingency Sample - Collect
Sample - To Platform

Check CDR Ready
LRV - Unlock from LM
Descend to Surface

Aft Lanyard - Unstow
- Pull to assist
- Discard
Pallet Post - Erect

0+36 LRV - Setup
•Chassis Hinge Pins - Check
•Battery Covers-Check Closed

16MM LRV OPLY

CDR-4 | EVA-1 | 7/1/71

TV Tripod - Unstow
TV Camera - To Tripod
TV - Position 12:00/50 Ft.
Lens - Set f-11, 12.5mm, Pk.
Check Hou TV Reception

0+29 LRV Thermal Blanket - Remove
Ck - Walking hinges - Locked
- Chassis - Parallel
- Outrigger Cables - Taut
LRV Left Tape - over Strut
LRV Right Tape - Deploy
[LMP: D-ring & Aft Lanyard]
Right Tape - Pull - MARK; Aft
Chassis Deploy - Fwd Unlock
Outrigger Cables - DISCNT
Left Tape - Pull
0+37 LRV - Set Up
•Chassis Hinge Pins - Check
•Ind. Lock Pins - Pull

LCRU NF. LRV OFFLD

LRV DPLY | 16MM LRV

0+42 16mm Cam - Assemble
Mag"CC" - Install on 16mm Cam
16mm Photo - CDR/LRV
(f8,1/250,24FPS)
16mm Cam - To LRV

CDR 70mm Cam - Unstow
Cam Bracket - Remove & Discard
Filter & Reseau Cover-To MESA

CDR 70mm Cam - To LMP RCU
Mag "NN" - To CDR 70mm Cam
CDR 70mm Cam-To CDR Floor pan

0+50 EVA #1 Pallet - To MESA Table
PLSS LiOH Cans - Check Pins
16mm Cam Bracket - Discard
LiOH Can(Band Off) - To Pallet

LMP-5 | EVA-1 | 7/1/71

LRV OFFLD | LCRU MF.

0+42 Mount LRV
LRV Post Deployment Checks
Test Drive LRV
[LMP: Photo CDR on LRV]
Park LRV - Quad IV - Face MESA
Power Down & Dismount LRV

0+46 LCRU Post Locks - Lift
Velcro Tab - Release
TCU Cable - To Batt Cover

LCRU - To LRV
Cable - Connect

TCU - To LRV
Cable - Connect
[LMP: EVA 1 Pallet to MESA]
Rake - To MESA Side
LGA - To Handhold
LGA Cable - Connect To LCRU

CDR-5 | EVA-1 | 7/1/71

DATE 7/13/71

DATE 7/13/71

LMP-6 | EVA-1 | 7/1/71

0+52 Geology Pallet - To LRV
Handrails & lanyards - Remove

SRC #1 - To MESA Table
C-Bag #1 - Unstow
Control Sample - Close
C-Bag #1 - To HTC, (L)

0+56 Unstow from Pallet
- Tongs - To HTC
- Ext. Handle/Scoop - To HTC
- Penetrometer - To Pallet
- Gnomon - To CDR Seat
- C-Bag #2 - To HTC (R)
- C-Bag #3 - To pallet back
- Vise - To pallet

1+04 Core Stems & Caps-To C-Bag #2
C-Bag #2 - To LMP Seat Bag
Sample Bags - To Floor Pans
C-Bag #4 - To HTC (R)

INGRESS GEO PALLET

CDR-6 | EVA - 1 | 7/9/71

0+53 HGA - Unstow at MESA
Yellow Bracket - Discard
Antenna - Rotate onto staff
HGA - to LRV
Velcro strap - Discard

Cable - Route behind TCU
- Connect to LCRU
LMP: Unstow tools
0+56 TV /Tripod to +Z Strut
TV PWR SW - OFF
TV Cable - Disconnect & Stow

TV Camera - To TCU
TV Cable - Connect

LCRU CB - CLOSE
LCRU PWR SW - INT
1+00 "CTV PWR SW - ON

ETB UNPK HGA & TV

GEO PALLET
INGRESS

1+05 Rake - To Pallet
Secure HTC for Driving
Check Lanyards Clear of Wheels
[CDR: LMP PLSS Ant. - Stow]

1+06 Ascend Ladder
Cont. Sample - Retrieve
Ingress LM
Cont Sample - Stow

CB(16) COMM: TV - OPEN
MODULATE - PM
PWR AMPL - OFF
TLM PCM - LO
LEC - To Overhead Handhold

1+10 Pallet - Transfer into LM
LEC Hooks to Surface
LEC - Stow to Side

Pallet - Strip
Pallet - To LM Floor

LMP-7
EVA-1
7/1/71

HGA & TV
ETB UNPK

1+01 Whip Antenna - Deploy
LCRU Sel - PMI/WB
Check - AGC, TEMP, & PWR
LCRU Sel - TV RMT
LCRU Blankets - 100% open
Conn. Cover (LCRU) - Closed

HGA Dish - Deploy
HGA - Point To Earth

ETB Contents - To LRV
ETB (Empty) - To Ladder Hook
LMP PLSS Ant. - Stow
[LMP: Ingress]

1+09 LEC - To Pallet #1
Pallet #1 - Transfer
LEC Hooks - To Ladder Hook

HGA - Stow

1+12 LCRU Sel - PMI/WB

CDR-7
EVA-1
7/1/71

DATE 7/13/71

DATE 7/13/71

LMP-8 | EVA-1 | 7/1/71

1+14 Egress
Pallet - Discard
LM Hatch - Close
Descend to Surface
[CDR: LMP PLSS Ant.-Unstow]

MESA Brackets - Remove
Tidy MESA Thermal Blankets

[CDR: Geo Eq - To LMP EMU]
- Hammer
- Core rammer
- Core Tube Caps
- C-Bag #4

C-Bag #1 - To CDR EMU
1+20 Ext Handle/Scoop - Tether
HTC - Check Secure & Closed
Bag Disp. - To 70mm Cam
70mm Cam - To RCU
16mm Cam - f8,1/250,12 FPS

GEO EQUIP | STAT #1

CDR-8 | EVA-1 | 7/1/71

Tidy up LRV
1+13 START
Drive to Nav. Init. Site

NAV CB - CLOSE
LRV Systems - Readout
NAV ALIGN

STOP

LMP PLSS Ant. - Unstow
1+18 Attach To LMP EMU:
- Hammer
- Core rammer
- Core Tube Caps(Bag #1 pkt.)
- C-Bag #4

[LMP: C-Bag #1 - To CDR]
Tongs - Tether
70mm Cam - To RCU

NAV ALIGN | STAT #1

GEO EQUIP
STAT #1

LRV Systems - Readout

1+25 TRAVEL (0:17)
- Possible Ray
- Lineaments, fillets, mounds
- Raised rille rim (levee)
- Block distribution

1+42 CPI (0:02) Canyon Crater

1+44 TRAVEL (0:07)
- Elbow Ejecta distribution
- Drive close to rim

1+51 Geology Station #1 (0:15)
- Pan from rim
- Sample radially(rim/blanket)

LMP-9 EVA-1 7/1/71

NAV ALIGN
STAT #1

START Gyro - To Hou Update

1+25 TRAVEL (0:17)
- Possible Ray
- Lineaments, fillets, mounds
- Raised rille rim (levee)
- Block distribution

1+42 CPI (0:02) Canyon Crater

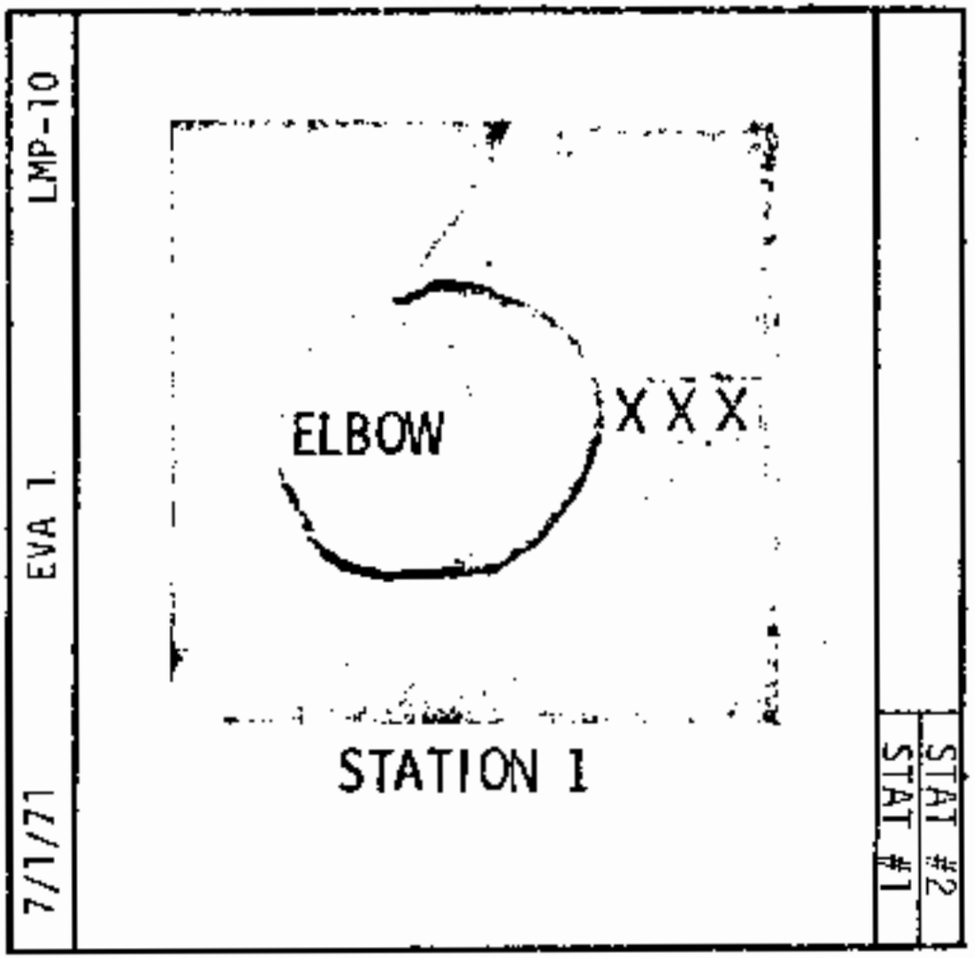
1+44 TRAVEL (0:07)
- Elbow Ejecta distribution
- Drive close to rim

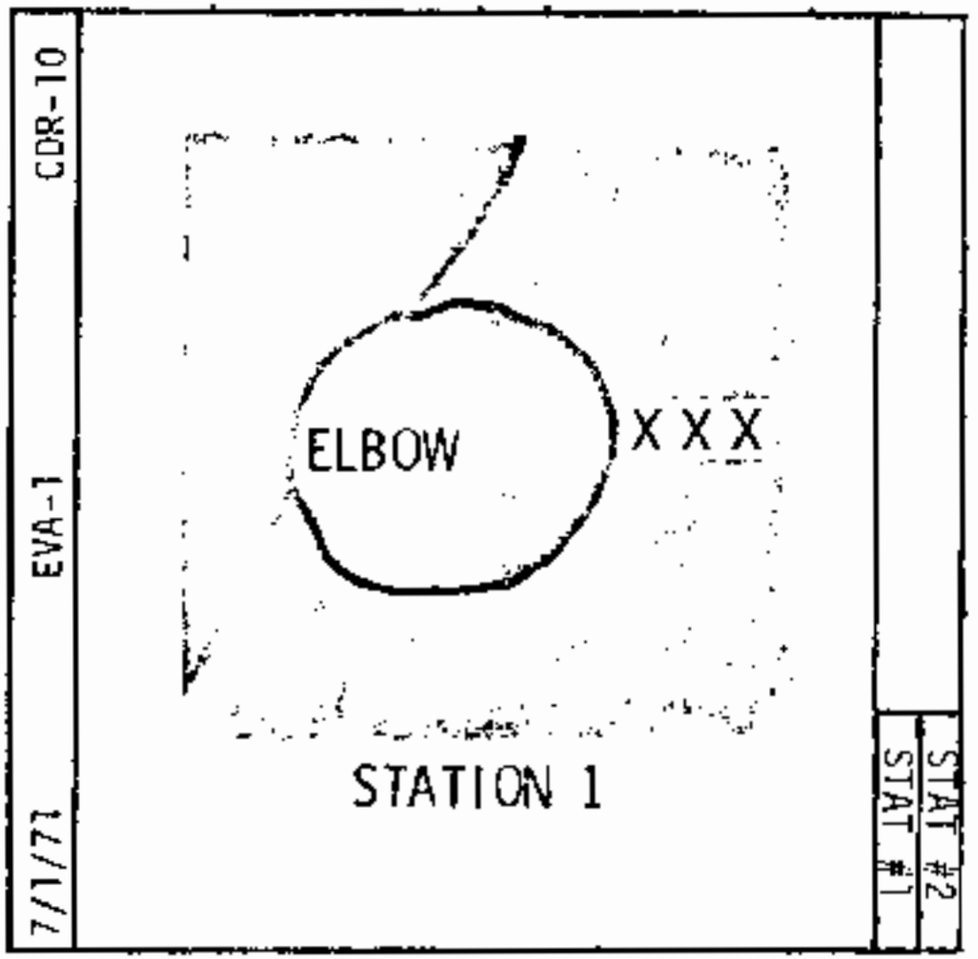
1+51 Geology Station #1 (0:15)
- Pan from rim
- Sample radially(rim/blanket)

CDR-9 EVA-1 7/1/71

DATE 7/13/71

DATE 7/13/71


7/1/71
EVA 1
LMP-10
ELBOW
XXX
STATION 1
STAT #1
STAT #2


7/1/71
EVA-1
CDR-10
ELBOW
XXX
STATION 1
STAT #1
STAT #2

STAT #1
STAT #2

2+06 TRAVEL (0:08)
- Elbow ejecta distribution
- Change in slope toward front
- Change in rock type
- Change in ground texture
- St. George ejecta dist.

2+14 Geology Station #2 (0:45)
- Sample radially
- Comprehensive sample
- Documented sample
- Double core

(Trench - SESC and soil)
(SESC - To CDR's C-Bag)
(Stereo pan-100m along front)
(500mm)
(Penetrometer)

LMP-11
EVA-1
7/1/71

STAT #1
STAT #2

2+06 TRAVEL (0:08)
- Elbow ejecta distribution
- Change in slope toward front
- Change in rock type
- Change in ground texture
- St. George ejecta dist.

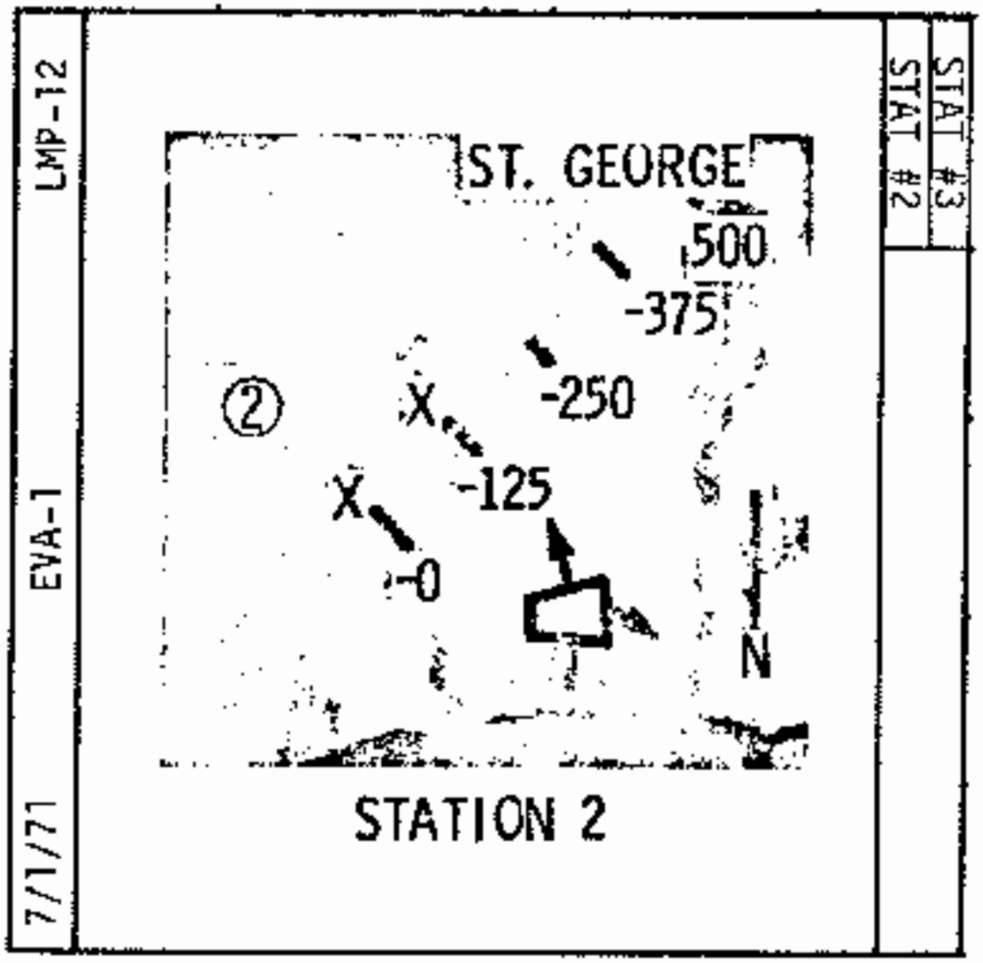
2+14 Geology Station #2 (0:45)
- Sample radially
- Comprehensive sample
- Documented sample
- Double core

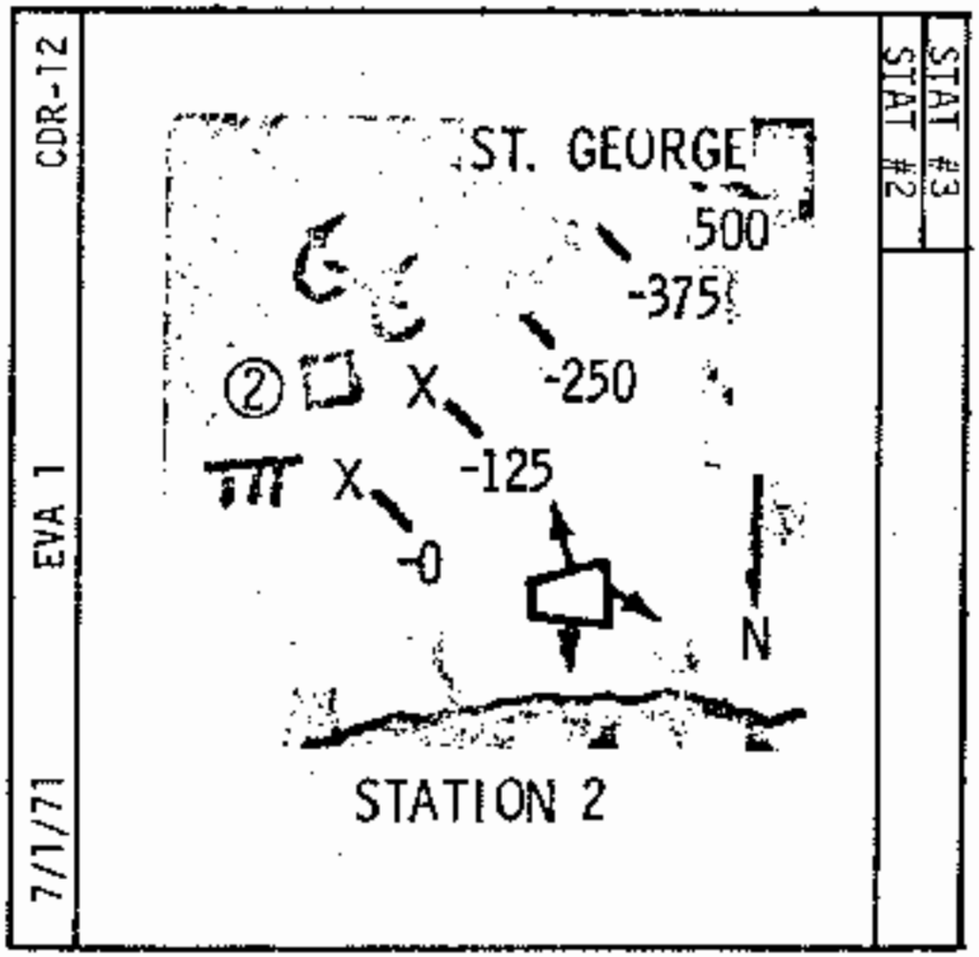
(Trench - SESC and soil)
(SESC - to CDR C-Bag)
(Stereo pan-100m along front)
(500mm)
(Penetrometer)

CDR-11
EVA-1
7/1/71

DATE 7/13/71

DATE 7/13/71


LMP-12
EVA-1
7/1/71
ST. GEORGE
500
-375
-250
-125
-0
②
X
X
N
STATION 2
STAT #2
STAT #3


CDR-12
EVA 1
7/1/71
ST. GEORGE
500
-375
-250
-125
-0
②
X
X
N
STATION 2
STAT #2
STAT #3

STAT #2 STAT #3

2+59 TRAVEL (0:09)
- Lateral/Vertical changes along front
- Block distribution
- Possible rock flows
- Patterned ground
- Cmpre crater frequency/state
- Observe EVA II route

3+08 Geology Station #3 (0:14)
- Describe "Flow" Mtrl/source
- Vertical/lateral changes
- Documented samples - -"Flow"/Front (-Mare)

3+22 TRAVEL (0:28)
- Observe EVA II route
- Front/Mare relations
- Possible ray material
- Compare to earlier mare
- Extent of "slide" boundary

LMP-13 EVA-1 7/1/71

STAT #2 STAT #3

2+59 TRAVEL (0:09)
- Lateral/Vertical changes along front
- Block distribution
- Possible rock flows
- Patterned ground
- Cmpre crater frequency/state
- Observe EVA II route

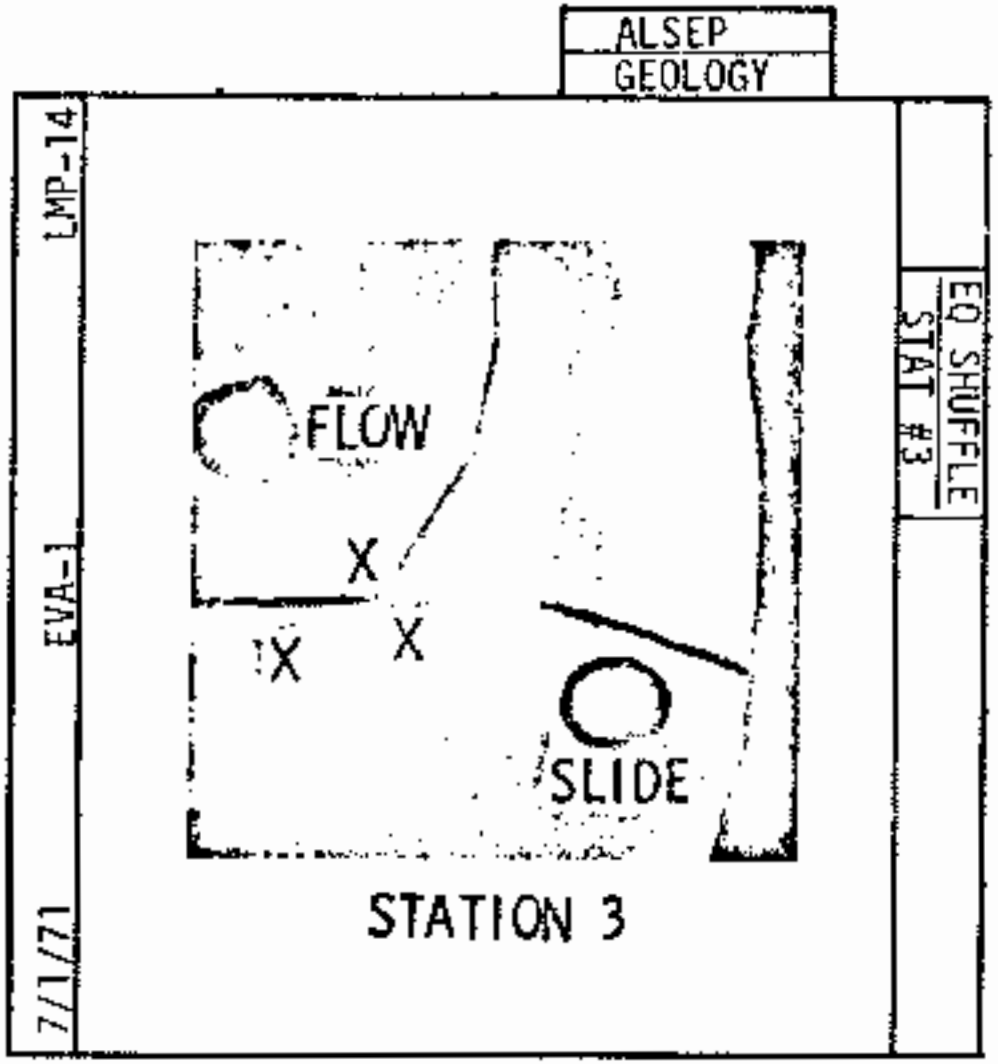
3+08 Geology Station #3 (0:14)
- Describe "Flow" Mtrl/source
- Vertical/lateral changes
- Documented samples- -"Flow"/Front (-Mare)

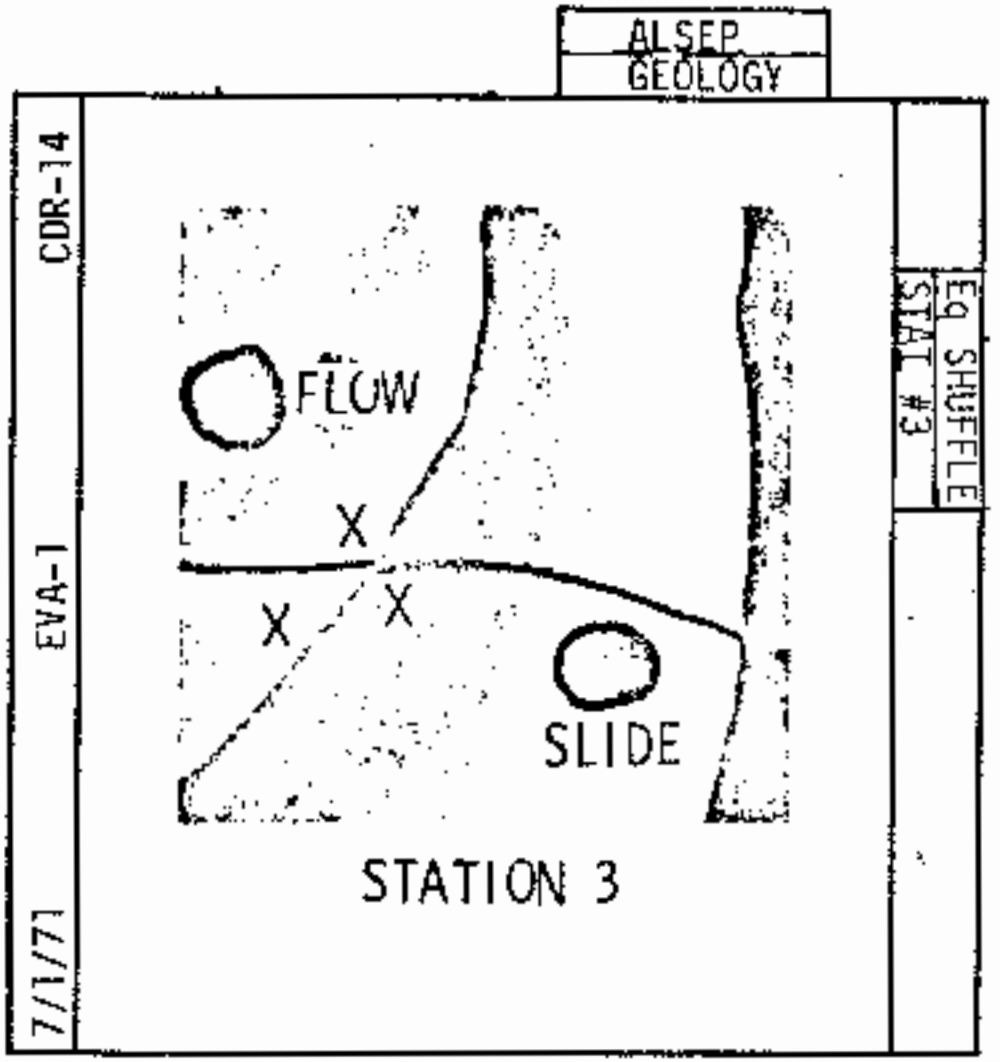
3+22 TRAVEL (0:28)
- Observe EVA II route
- Front/Mare relations
- Possible ray material
- Compare to earlier mare
- Extent of "slide" boundary

CDR-13 EVA-1 7/1/71

DATE 7/13/71

DATE 7/15/71


ALSEP
GEOLOGY
LMP-14
EVA-1
7/1/71
FLOW
X
X
X
SLIDE
STATION 3
EQ SHUFFLE
STAT #3


ALSEP
GEOLOGY
CDR-14
EVA-1
7/1/71
FLOW
X
X
X
SLIDE
STATION 3
EQ SHUFFLE
STAT #3

ALSEP
GEOLOGY

STAT #3
Eq SHUFFLE

3+50 LRV Systems - Readout
Dismount LRV
LMP Seat - Fold
70mm Cam - Under CDR Seat
Ext Handle & Scoop - To HTC

[CDR; LMP Eq - To LRV]
- Core Tube Caps & rammer
- Hammer
- C-Bag #4 -To LMP Seat bag
- C-Bag #2 -To HTC (R)

C-Bag #1 - Remove from CDR
- To HTC, (L)
Tidy Velcro Covers

LMP-15
EVA-1
7/1/71

GEOLOGY
ALSEP

STAT #3
Eq SHUFFLE

3+50 Park LRV
- Heading SE; facing SEQ Bay

Nav CB - Open
[STOP]
LCRU Sel - TV RMT
HGA - Point To Earth

70mm Cam - To Under Seat
Tongs - To HTC

LMP Geo Equip:
- Core Tube Caps - Discard
- Core rammer - To HTC
- Hammer - To HTC

C-Bag #4 - Remove from LMP
Tidy Velcro Covers
[LMP: Remove C-Bag #1]

C-Bag #4 - Under LMP Seat
C-Bag #2 - To HTC (R)

CDR-15
EVA-1
7/1/71

DATE 7/13/71

DATE 7/13/71

LMP-16 | EVA-1 | 7/1/71

3+55 SEQ Bay Doors - Open
Pwr Pkg - Offload
- Position for Fueling

Pip Pins (4) - Pull
UHT - Tether
Carry Bar - To CDR

Fuel Cask - Tip Down
Dome Tool - Engage & Check
Dome - Remove & Discard

Fuel Tool - Engage & Check
Fuel Element - Into RTG
4+06 Report RTG Fueled

Pwr Pkg - To Carry Bar
SEQ Bay Doors - Close

ALSEP - To Deploy Site

ALSEP LAYOUT
ALSEP OFFLD 1

CDR-16 | EVA-1 | 7/1/71

3+57 EXPTS Pkg - Offload
UHT - Tether
Carry Bar - To EXPTS Pkg

Drill - To LRV
LRRR - To LRV

HGA - Stow
LCRU Sel - PM1/WB
4+10 START

Drive to ALSEP SITE

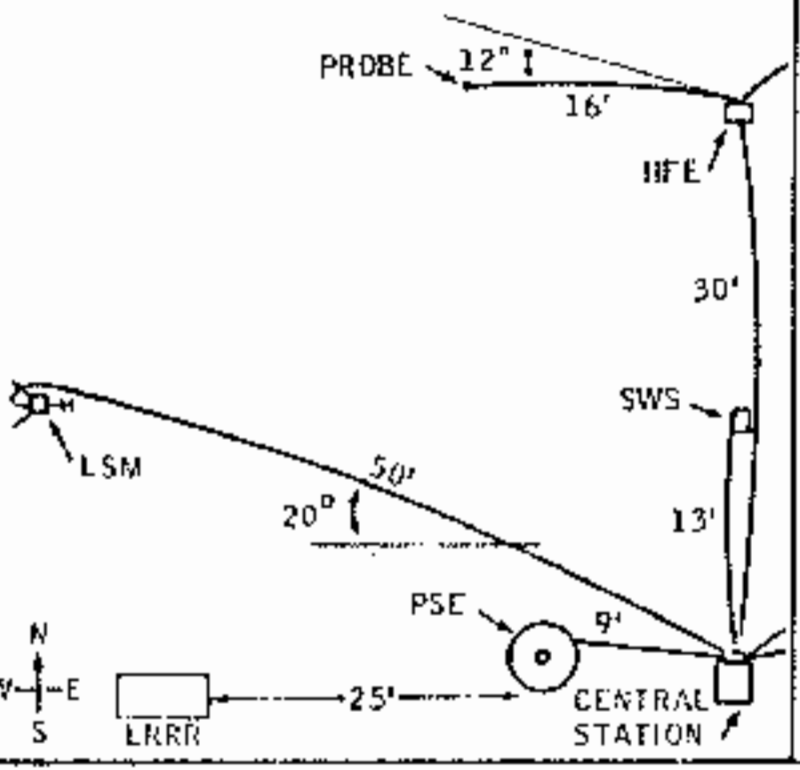
CAUTION

Do Not Point HGA or LGA within ±20° of ALSEP Antenna

SITE RQMTS
ALSEP OFFLD

ALSEP OFFLD
ALSEP LAYOUT

ALSEP ARRAY A-2H LAYOUT
FOR A NORTHEAST LANDING SITE



LMP-17
EVA-1
7/1/71

ALSEP OFFLD
SITE ROUTE

SITE REQUIREMENTS:

- General - Smooth flat
  - All thermal rad have clear view
- HFE Probes-
  - 200 ft from fresh craters
  - 5 diameters from boulders over 2 ft
  - avoid Topo high (Scale 100's of ft.)
  - Avoid features over 2 ft dia. with slope greater 10°

4+15 Park LRV

- Heading North
- Facing C/S Site

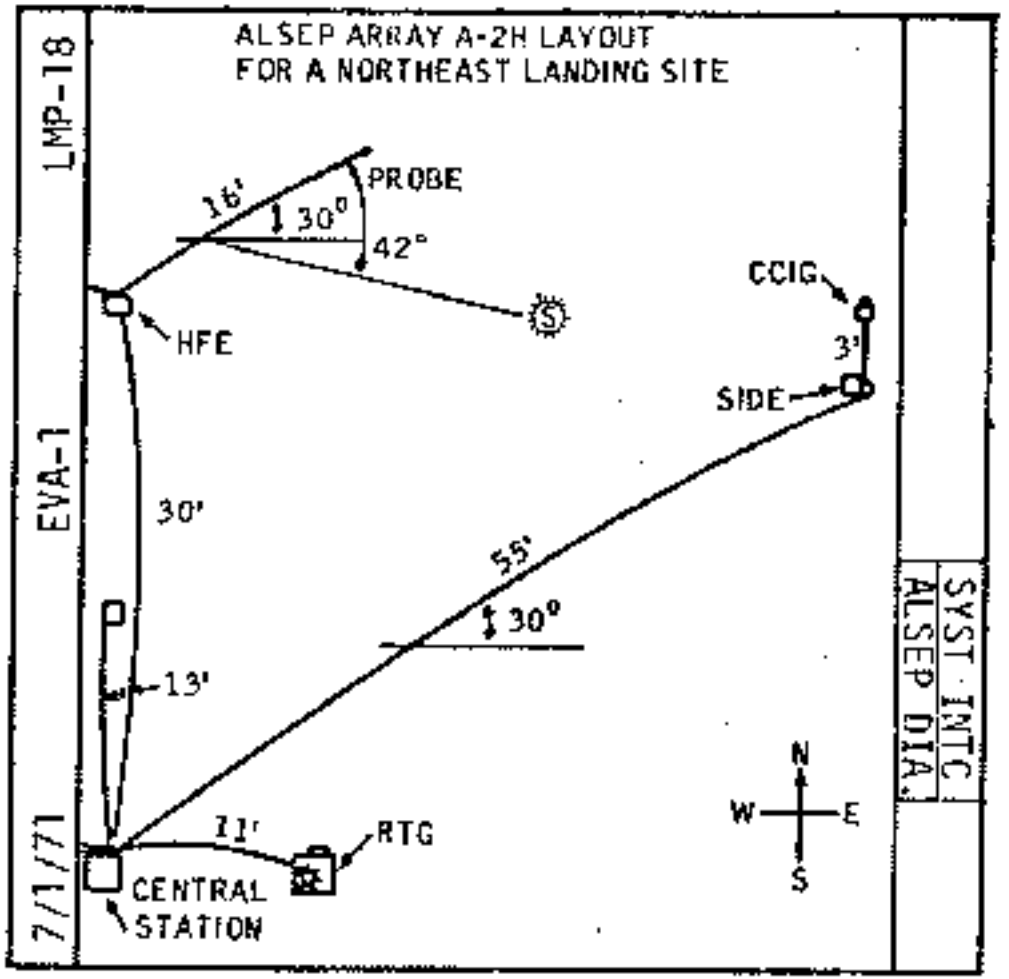
LRV Battery Temps - Readout

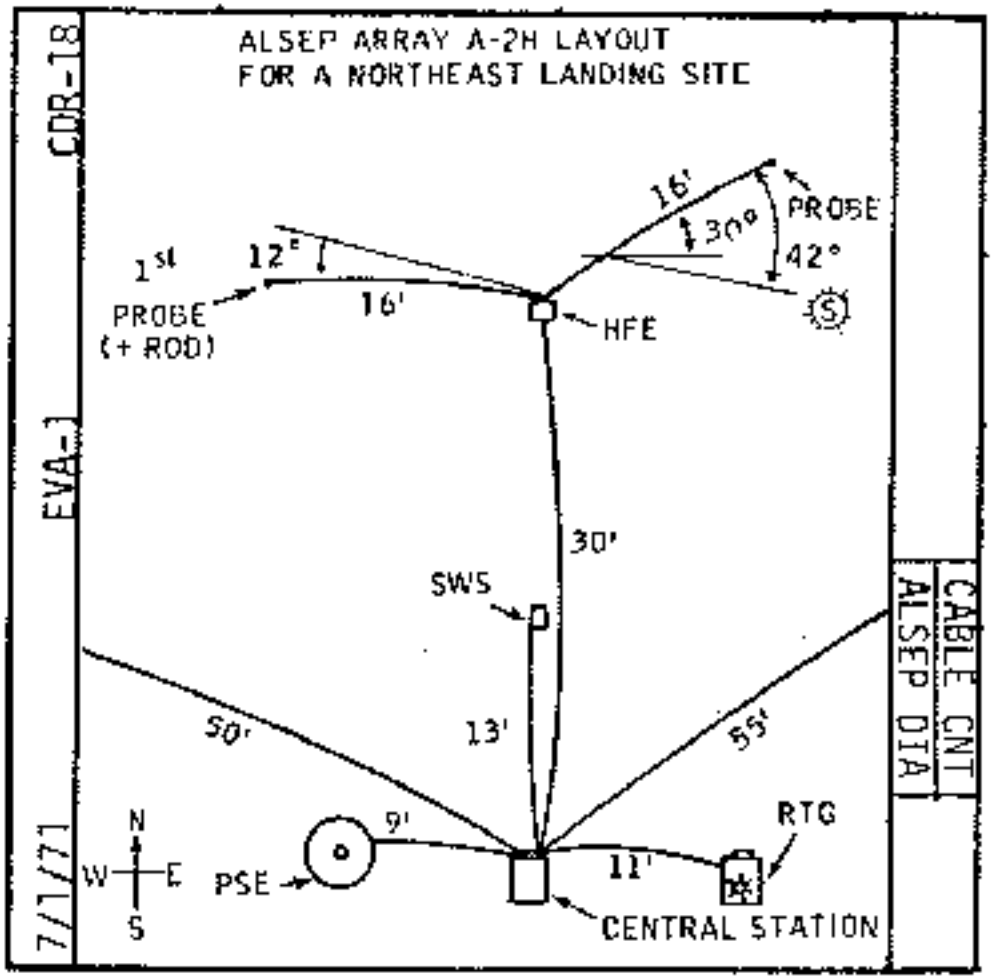
STOP!

CDR-17
EVA-1
7/1/71

DATE 7/13/71

DATE 7/13/71


ALSEP ARRAY A-2H LAYOUT
FOR A NORTHEAST LANDING SITE
LMP-18
EVA-1
7/1/71
16'
30°
PROBE
42°
HFE
CCIG
3'
SIDE
30'
55'
30°
13'
11'
RTG
CENTRAL STATION
N
W
E
S
SYST INTC
ALSEP DIA.


ALSEP ARRAY A-2H LAYOUT
FOR A NORTHEAST LANDING SITE
CDR-18
EVA-1
7/1/71
16'
30°
PROBE
42°
1st
12°
PROBE
(+ ROD)
16'
HFE
30'
SWS
50'
13'
55'
9'
PSE
11'
RTG
CENTRAL STATION
N
W
E
S
CABLE CNT
ALSEP DIA

ALSEP DIA. SYST INTC

4+18 Expts Pkg - To Final Position
Pwr Pkg - Position 10 ft East

HFE Pip Pins (3) - Pull
Pwr Pkg - Tip Down

RTG Cable - Deploy
Report Shorting Sw Reading
RTG Cable - Connect

SUBP - Remove from Pwr Pkg
- Bolts (2)

4+26 SIDE - Remove From SUBP
- Bolts (5) - Release
- Lift SIDE from SUBP
- Cable Reel Unstow
- Legs Deploy
- SIDE to Surface

LMP-19 EVA-1 7/1/71

ALSEP DIA CABLE CNT

4+18 LRV Battery Covers - Open
LCRU Sel - TV RMT
HGA - Point To Earth
Plan ALSEP Deployment
LRRR - To Surface
- cubes facing sunlight
Drill - To Surface
- Drill facing sunlight

4+21 HFE Pallet - Remove (2 bolts)
- To 15 ft N. C/S
HFE Cable - Connect To C/S
HFE Pallet - To 30 ft N C/S
16 ft of Probes - Keep Clean
[LMP: Remove SIDE from Subp]
4+28 Probe Box - Remove (4 bolts)
Probes - Position
- With Rod - To W, 12°S S/L
- W/O Rod - To E, 42°N S/L

CDR-19 EVA-1 7/1/71

DATE 7/13/71

DATE 7/13/71

LMP-20

SIDE Cable Connector - Unstow
C/S Dust Cover - Open
SIDE Cable - Connect To C/S

4+32 Carry Bar - Remove From C/S
C/S - Tip Down
Carry Bar - To SUBP
PSE Stool - Unstow

Prep PSE Site - 9 ft W. C/S
PSE Stool - To Surface

C/S Dust Cover - Remove
PSE - Deploy
- Bolts (4) -Release & Remove
- PSE - To Stool, UHT In
- Girdle Remove, UHT Out
- Skirt - Deploy
- Level

4+40 • Report Alignment

EVA-1

7/1/71

PSE

SWE, LSM

CDR-20

4+34 [Elect Box] - Remove (4 bolts)
Pallet - Kick Clear
Dust Cover - Remove
Elect Box - Level & Align

Pallet - Discard 16 ft North
[LMP: PSE deploy]

4+37 [Drill] - To LMP Seat
• [DECAL]
Drill & Rack - To West Probe
[LMP: SWE & LSM deploy]
Implant Bore Stem Into Surface

Remove [RAMMER]
Insert Probe Into Stem
Report Probe depth
[LMP: Raise C/S]

EVA-1

7/1/71

CORE PROBES

PSE SWE LSM	4+41 SWE - Deploy • Bolts (4) - Release • SWE - To 13 ft N. C/S • Check Legs Locked Down • SWE - To Surface • Align & Level • Check Door Open 4+46 LSM - Remove From C/S • Bolts (2) - Release • Tiedown - Pull Horiz • Square Handle -Lift LSM Off • Cable - Check Free of C/S 4+51 LSM - Deploy • LSM - To 50 ft, 8°N Sunline • Stowage Bracket - Remove • Legs - Deploy • Cable - Outside Legs • LSM - To Surface	LMP-21 EVA-1 7/13/71

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LMP-22	•Foam Collar - Remove •Sensor Arms - Deploy •Dust Covers (4) - Discard •Align & Level •Report Alignment	LSM C/S	C/S
	•Check LSM Free of Parts •Check Doors Open		
EVA-1	4+59 C/S - Align C/S Sunshield - Raise •Bolts - Release •Antenna Cable - Deploy •Rear Curtain Cover - Remove •Check Sunshield Free •Interior Bolts (3) Release 5+02 •Sunshield - Raise		
7/1/71			

LSM, C/S
C/S

Side Covers - Discard
Side Curtain Velcro - Mate

5+06 Antenna Mast - Install
Gimbal - Mount on Mast
Antenna - Mount on Gimbal

Check C/S Alignment

5+10 Antenna - Level & Align

OFF Sets - Enter & Readout
- AZ 35.81
- ELEV 4.71

CHECK Antenna Level & Aligned

LMP-23
EVA-1
7/1/71

PROBES
CORE

5+04 Drill, Rack & Rod - To E Probe

Implant Bore Stem Into Surface
Insert Probe Into Stem
5+20 Report Probe Depth
[LMP: SIDE deploy]
- [Check 16 ft Area Clean
  Check Elect Box Level & Align

Drill & Rack - To Core Site
Drill Chuck - Remove & Discard
Treddle To Drill Site

16mm Cam Mag - Change To "D"
16mm Photo - Drill Site
(f8, 12 fps, 1/250)
[LMP: Activate C/S]
5+26 Implant Core Stem - 1 inch/sec
Break Drill from stem

CDR-21
EVA-1
7/1/71

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7/1/71	LMP-24 EVA-1	5+15 SIDE - Deploy • SIDE - To 55 ft, 42°N. Sun • Ground Screen - Implace • CCIG Cover - Remove • CCIG - To G/S Tube • SIDE - To Surface • Level & Align • Tube Pin - Pull • CCIG - To surface • Safety Pin - Pull • Report Pin Pulled 5+24 • Check Level and Alignment	SIDE LRRR

SIDE LRRR

Shorting Switch - Depress
Check Amps Zero
Astro Switch #1 - Clockwise
5+27 Request Xmitter Turn ON

70mm Cam - To RCU
70mm Mag - To Color, "KK"

LRRR - Deploy
- •LRRR - To 25 ft W. C/S
- •Alignment Device - Deploy
- •Reflector Array - Deploy
- •Leveling leg - Deploy

LRRR - Level & Align
Dust Cover - Remove
Check Level & Alignment

LMP-25 EVA-1 7/1/71

DATE 7/13/71

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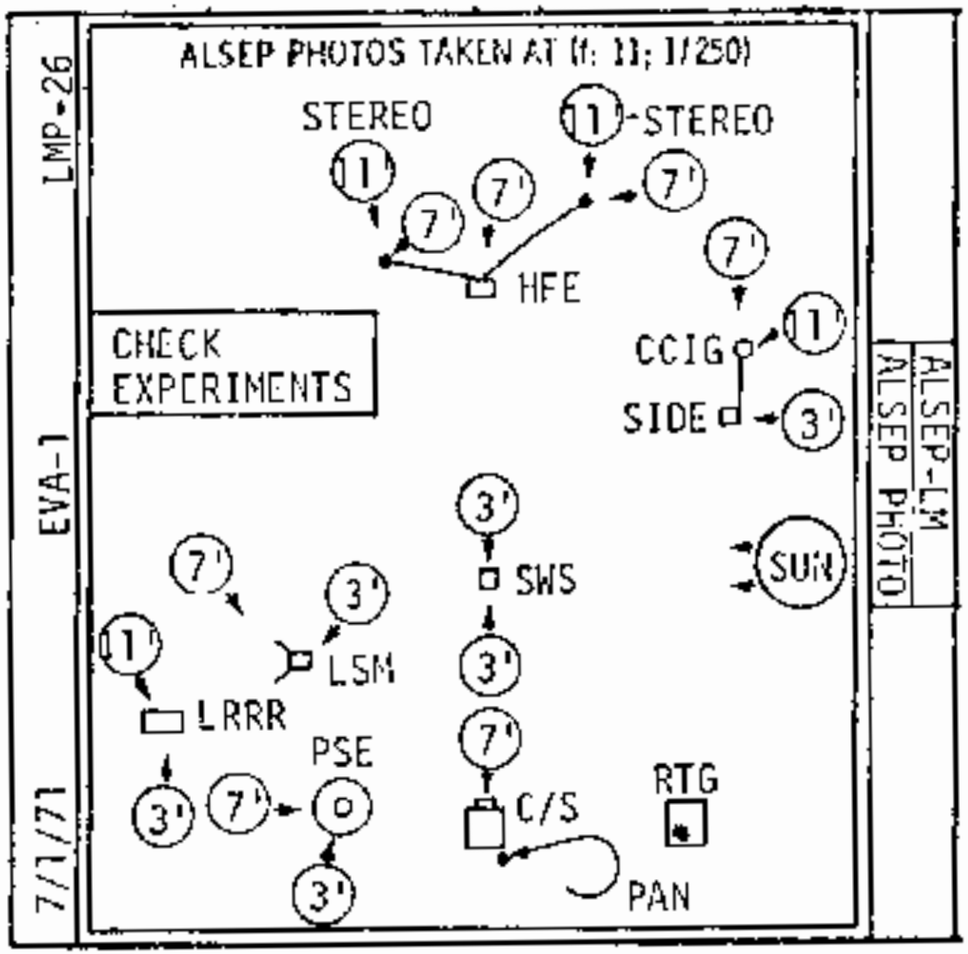

ALSEP PHOTOS TAKEN AT (f: 11; 1/250)
STEREO
11'-STEREO
HFE
CHECK EXPERIMENTS
CCIG
SIDE
SWS
SUN
LSM
LRRR
PSE
C/S
RTG
PAN
LMP-26
EVA-1
7/1/71
ALSEP-LM
ALSEP PHOTO

ALSEP PHOTO
ALSEP-LM

5+35 Photograph LRRR & ALSEP
Note: Deploy LSM Sunshield
after LSM Photography

UHT Discard
5+47 Top Off C-Bags #1, 3 & 4

5+59 Mount LRV
Traverse to LM

LRV Systems - Readout
LRV CB's - Pull Bus A,B,C,D
Dismount LRV

70mm Photo - LRV/Dust
(f-11; 1/250;11ft)
- X-Sun (2)
- DN-Sun (1)

LMP-27
EVA-1
7/1/71

CDR-22
EVA-1
7/1/71

5+37 70mm Cam - Retrieve From LRV
70mm Photo Pan - 7ft S. Stem
70mm Cam - To LRV
[LMP: LRRR deploy]
Core Stem Caps - To C-Bag #1
C-Bag #2 - To LMP Seat
C-Bag #4 - To HTC
Core Tubes - To C-Bag #4

5+42 Check Stem Free In Surface
Drill - Remove From Stem
[LMP: ALSEP photos]
Cap Drill Stem (Black - #A)

Rotate Stem Clockwise &
Pull Stem From Treddle

Core Stem Top End - To Vise
Cap Stem, Bit End #B
Stems - to C-Bag #1 (2/pkt.)

LRRR CORE

DATE 7/13/71

DATE 7/13/71

CORE
LRRR

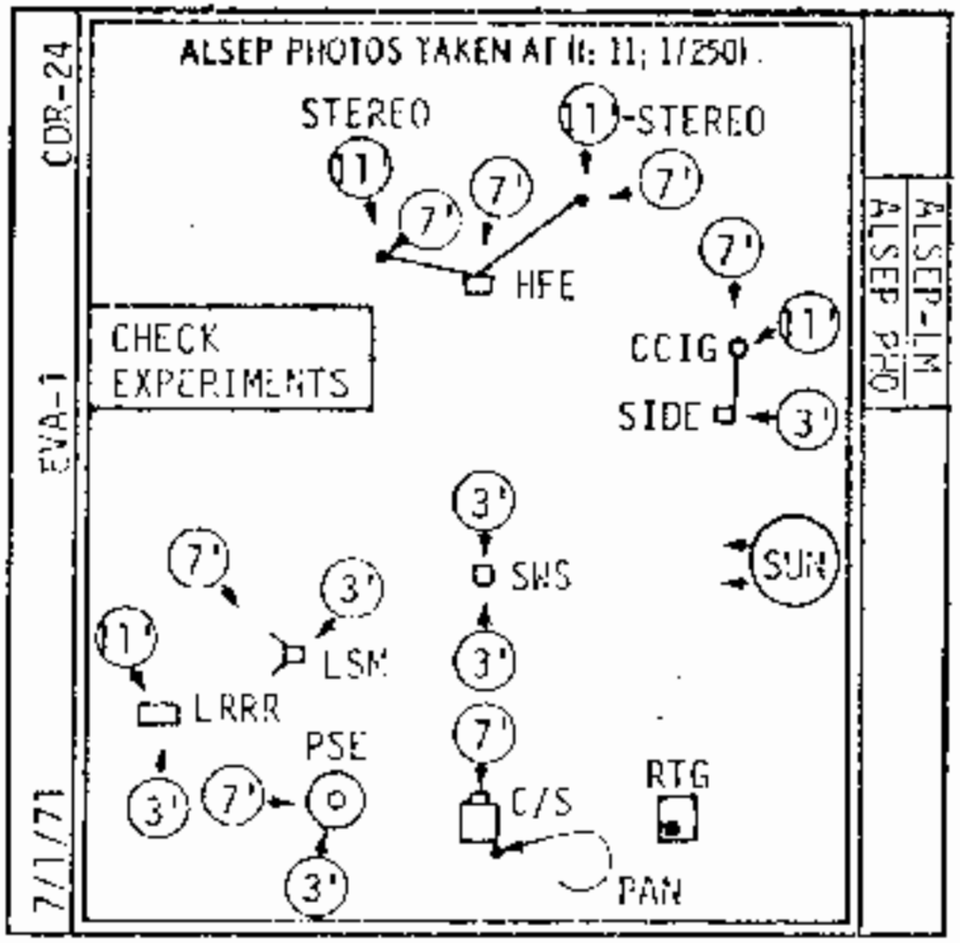
If LMP has not completed ALSEP Deployment, Deploy LRRR and/or Photo ALSEP.

For ALSEP Photography
- 70mm Cam - To RCU
- 70mm Mag - To Color, "KK"

LRRR - Deploy
- LRRR - To 25 ft W. C/S
- Alignment Device - Deploy
- Reflector Array - Deploy
- Leveling leg - Deploy

LRRR - Level & Align
Dust Cover - Remove
Check Level & Alignment

CDR-23
EVA-1
7/1/71


ALSEP PHOTOS TAKEN AT (f: 11; 1/250)
CDR-24
EVA-1
7/1/71
ALSEP-LM
ALSEP PHO
STEREO
11'-STEREO
11'
7'
HFE
CHECK
EXPERIMENTS
CCIG
SIDE
3'
SWS
SUN
LSM
LRRR
PSE
C/S
RTG
PAN

DATE 7/13/71

DATE 7/13/71

ALSEP PHO ALSEP-LM	5+47 UHT - Discard Top Off C-Bags #1, 3&4 5+57 LRV Battery Covers - Close HGA - Stow LCRU Sel - PMI/WB START LRV Batt. Temps - Readout 6+03 Park LRV At MESA •Heading North •In Sunlight STOP LRV Battery Covers - Open LCRU Blankets - 35% open LCRU Sel - TV RMT HGA - Point To Earth	CDR-25 EVA-1 7/1/71

LMP-28

EVA-1

7/1/71

6+07 SWC - Unstow from MESA
- Deploy 60 ft. NW

Photo SWC; f-11, 1/250
- Stereo Pair, X-Sun, 11 ft
- DN-Sun, 11 ft
- Location

6+15 LM Inspection & Photos
- Pan 12:00/30ft
- Pan 4:00/30ft
- Pan 8:00/30ft

6+23 Flag - Unstow
Flag - To CDR or LRV
Hammer - Retrieve
Staff - Drive 1:30/30 FT

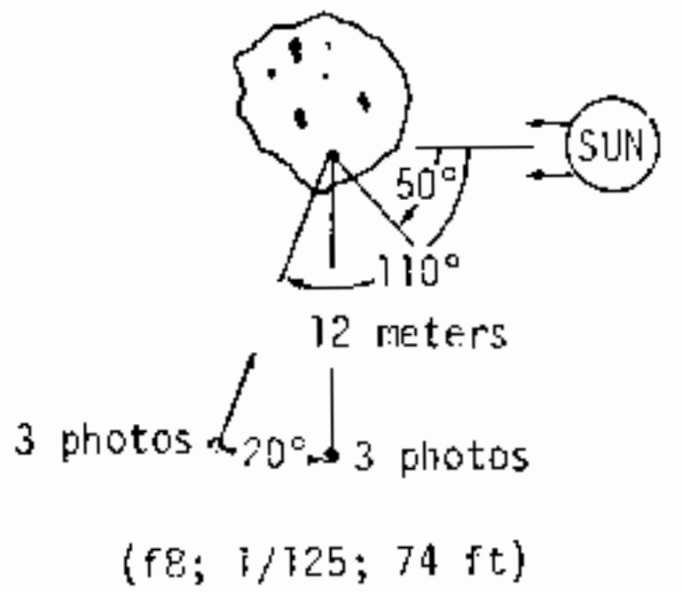
LM PANS
CLOSEOUT

CDR-26

EVA-1

7/7/71

6+12 Filter to 70mm Cam
Tongs & Gnomon - Retrieve
[LMP: SWC deploy]
Polarimetric Photography
Rocky Area - Select
FAR-Field Photos



(f8; 1/125; 74 ft)

NEAR FIELD
FAR FIELD

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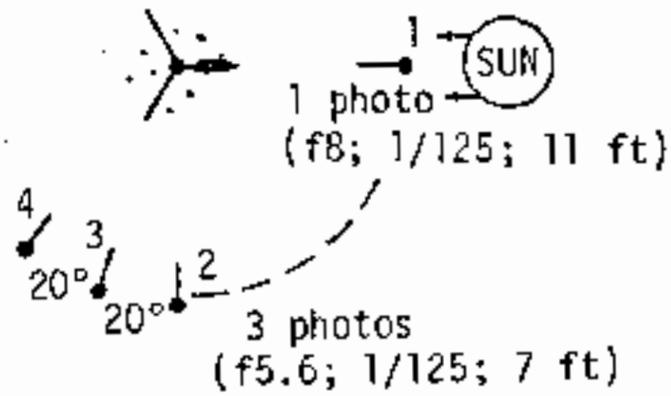
FAR FIELD
NEAR FIELD

6+19 Gnomon Place
Near Field Photos



Collect 4 Rock Samples
[LMP: Photo pans]
Post Sampling Photos
- 1 Down Sun
- 2 X-Sun

Samples to C-Bags
Gnomon & Tongs - Stow
70mm Cam - To LRV

CDR-27
EVA-1
7/7/71

LM PANS CLOSEOUT	70mm Photo - CDR/Flag (f11,1/250,11ft) 70mm Cam - To CDR [CDR; 70mm Photo LMP] Hammer - To HTC 6+28 Check C-Bag #1 Contents •Core stems •SESC •Full C-Bag #1 - To SRC #1 Seal Protectors - Remove Check Seal - Clean Close & Seal SRC #1 C-Bag #4 - To MESA C-Bag #3 - To MESA 6+33 Tidy MESA Blankets	LMP-29 EVA-1 7/1/71

CDR-28 EVA-1 7/1/71	6+25 Flag - Retrieve From LRV - Mount in Staff [LMP: Photo CDR/flag] 70mm Photo - LMP/Flag (f-11, 11ft, 1/250) 6+28 ETB - To CDR Footpan Collect in ETB • 70mm Cams (2) (OO),(KK) • 70mm Mags (2) (NN),(LL) • 500mm Lens Cam Mag (MM) • 16mm Mags (3) (CC),(DD)(EE) • Maps [LMP: Pack SRC #1] Reseau Cover - To 500mm Cam 500mm Cam - Under CDR Seat 16mm Cam - Point North ETB - To MESA Table Bag "Covers" - To ETB	INGRESS ETB LOAD

DATE 7/13/71

DATE 7/13/71

LMP-30

Dust Brush - Unstow
Clean EMU'S
[CDR: LMP PLSS Ant. - Stow]
Dust Brush - To Geo Pallet

LRV Check - All Samples & Mags

EVA-1

6+36 Ingress - Carry C-Bag #3
LEC - To Overhead Handrail

6+39 Transfer:
- SRC #1
- ETB

Stow Equipment

6+53 Pass LEC To CDR

Close Hatch

7/1/71

INGRESS

ETB LOAD

INGRESS

6+35 Clean EMU'S
LMP PLSS Antenna - Stow

6+36 [LMP: Ingress]

LEC - To SRC #1
SRC #1 - Transfer

ETB - Transfer
6+46 LEC Hooks - To ladder hook

LCRU Pwr SW - OFF
Ck LCRU Blankets - 35% open
Clean EMU
6+50 Ascend Ladder with C-Bag #4
Stow LEC On Platform
Ingress LM

CDR-29

EVA-1

7/1/71

DATE 6/30/71

POST EVA 1

PLSS PRIM H2O - CLOSE
Fwd Hatch - Close & Lock
Dump Valves (Both) - AUTO

NOTE: PLSS O2 & PRESS Flags May Come On During Repress. If PLSS O2 <10% Manually Control Cabin Repress To Maintain Positive PGA Pressure. (Leave Cabin Repress CB Open For Manual Repress)

CABIN REPRESS - AUTO
CB(16)ECS: CABIN REPRESS - Close
MASTER ALARM & CABIN Warning Lt - On
Verify Cabin Press Increasing
PRESS REG A & B - CABIN

PLSS O2 - OFF @ Cabin > 2.5 Psia

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psia
Use Purge Valve To Depress PGA As Reqd

POST EVA SYSTEMS CONFIGURATION

Verify EVA CB Configuration
(White Dots Out + EVA Decals)
CB(16) ECS: SUIT FAN 2 - Close
SUIT FAN ΔP- Close
ECS Caution & H2O SEP Comp Lts - Out

Doff Gloves, Stow On Comm Panel
Doff Helmets With Visors, Lower Shades, Stow In Helmet Bags

Verify Safety On Dump Valve
DES H2O Vlv - OPEN
Remove Purge Valve, Stow In Purse
Disconnect OPS O2 Hose

Connect LM O2 Hoses R/B & B/R
PGA Diverter Vlv - Horizontal

SUIT ISOL (Both) - SUIT FLOW
PLSS PUMP - OFF (Left)
PLSS FAN - OFF (Left)

Disconnect PLSS H2O From PGA
Connect LM H2O

PLSS Mode (Both) - O
AUDIO CB - Open
Connect To LM Comm

AUDIO CB - Close
AUDIO (CDR & LMP)
  VHF A - RCV
  B - OFF
  MODE - ICS/PTT
  RELAY - OFF

COMM:
VHF A XMTR - OFF
  A RCVR - ON
  B XMTR & RCVR - OFF
TLM BIOMED - LEFT
VHF ANTENNA - AFT
UPLINK SQUELCH-OFF

PLSS O2 RECHARGE

Verify DES 2 O2 >56%

* * * * LMP 1st: * * * *
Connect LM O2 To PLSS
HI PLSS O2 FILL - OPEN Then CLOSE
  After 4 Min

PLSS Mode - AR (O2 QTY ~85%)
PLSS Mode - O

Disconnect LM O2

CDR Repeat O2 RECHARGE * * * *.

Stow LM O2 Supply Hose

PLSS/OPS DOFFING

Disconnect OPS Actuator From RCU
Disconnect RCU From PGA
PLSS PUMP,FAN-OFF (LEFT) MODE SEL - O
Disconnect RCU From PLSS, Stow In
  LCG Bag (LHMS)

Disconnect PLSS O2 Hoses
Doff PLSS/OPS (LMP 1st)
Stow LMP PLSS On Floor
Stow CDR PLSS On Mid-Step
Stow OPS O2 Hose & Actuator
Disconnect OPS Antenna Lead

DATE 6/30/71

Install Gas Conn Plugs (Purse) In PGA
Install PLSS Elect Dust Cap (Purse)

CAUTION: Insure PLSS LiOH Carts & Batts Numbered 1 or 2 Replaced with 3 or 4.

CDR 1st: # # #
Change PLSS Batt, Stow In BSLSS Bag
Connect Cable to Battery
Stow PLSS Hoses & Straps

Disconnect Left End Of PLSS Tool Harness
Change LiOH Cart, Temp<130°, Read Cart Decal
Stow Used LiOH Carts Inside Canisters
Stow Canisters In BSLSS Bag
Install PLSS Tool Harness

Remove OPS & Stow Antenna Lead
Verify OPS O2 Press 5380 - 6380
Stow CDR OPS On Eng Cover
Stow CDR PLSS In Recharge Station

LMP PLSS To Mid-Step, Repeat Above ####

Stow LMP OPS On Floor Under Dump Vlv
Stow PLSS On Floor Against Hatch

POST EVA CABIN CONFIGURATION

127:35 BATT MGMT
(1609)
POWER/TEMP MON - ED/OFF
Check ED Volts A ___, B ___ (To Hou)
PWR AMP - PRIM
TLM PCM - HI
POWER/TEMP MON - BAT 1
BAT 1 HI V-ON; tb - gray
POWER/TEMP MON - BAT 2
BAT L (LMP) - OFF/RESET; tb - bp
BAT 2 - ON; tb - gray
POWER/TEMP MON - Check Bus Volts

Unstow Lunar Surface Checklist, 5-4
Stow EVA 1 Prep & Post Card

Stow Collection Bags #3 & 4 In Covers
#3 & 4 (ETB)
Stow Covers #2, 6, 7 & 8 Aft Eng Cover
Stow ETB On RH Cabin Floor, Fwd

Unstow Scale (Bot RHSSC)
Weigh SRC & Collection Bags #3 & 4,
Record On 3-2 & Report To Hou
Stow Scale In RHSSC

Stow SRC In Lower Comp
Stow CDR OPS In Top Comp
Place Collection Bags #3 & 4 Aft Eng Cvr

Stow LM ECS LiOH Cart In Bkt Aft
of Eng Cover

Verify Powerdown CB Configuration
(White Dots Out)

On Hou Cue: PWR AMP - OFF

S-BD VOICE - DN VOICE BU

On Call From CMP:
VHF A XMTR - VOICE
XMTR - OFF After Conversation

127:50 DOFF SUITS (30 MIN)
(1624)

TLM BIOMED - OFF

* * * * CDR 1st: * * * *
Empty UCTA (HTR)
SUIT ISOL - SUIT DISC
AUDIO CB - OPEN

DOFF PGA
Unstow Headset (LHSSC), Stow
Comm Carrier
Stow LM O2, H2O & Comm
Install PGA Elect Connector Cap (Purse)
Disconnect LCG, Bio Belt & UCTA
Insert LCG Plug (Purse)
Stow LCG Inside PGA
Close Inner & Outer Zipper
Attach Necking Cover (Aft RHSSC)
Stow On Eng Cover, Neck Aft &
CDR On RH, Face Up
LMP On LH, Face Down
Install One Glove
Cover PGA Legs With Jett Bag (LHSSC)

DATE 7/14/71

DATE 6/30/71

DRY PGA
Connect LM O2 Hoses, R/B & B/R
CABIN GAS RETURN - AUTO
SUIT GAS DIVERTER - PUSH - CABIN
SUIT ISOL - SUIT FLOW For ∿ 60 Min, Then
Configure ECS For Sleep

DOFF LCG
Disconnect Bio Belt Yellow & Blue Leads
Unsnap Belt & Remove
Stow LCG Inside PGA
Stow UCTA For Drying

DON CWG (ICG Bag, LHMS)
Snap Bio Belt To CWG (Only LMP Data Reqd)
Connect Yellow & Blue Leads
Don CWG Adapter (LHSSC), Connect
Bio Belt

DON ICG (Top Boot Compt)
Don Headset
Connect CWG Adapter

Connect LM Comm
Audio CB - CLOSE
Verify Comm

LMP Repeat DOFF SUITS * * * *

TLM BIOMED - RIGHT

128:15 5 MIN Before Transfer
(1649)
CB(11) HTR: URINE LINE - Close
HTR CONT: URINE LINE - HTR 1

PLSS O2 & H2O RECHARGE (30 MIN)

Verify 1 Hr Elapsed Since Initial
O2 Recharge (DES 2 O2 >56%)

Fold LMP's PGA Legs Over PGA Back

* * * * CDR 1st: * * * *
Connect LM O2 To PLSS
HI PLSS O2 FILL - OPEN Then CLOSE
After 10 min

Perform Feedwater Recharge (Decal):

PLSS AUX H2O - OPEN
Connect WMS To PLSS H2O DRAIN
LM DES H2O - CLOSE
Connect LM H2O To PLSS H2O FILL
LM DES H2O - OPEN 3 Minutes, Verify
Condensate Flow (Thru WMS Sight Glass)
LM DES H2O - CLOSE
Connect WMS To PLSS PRIM Vent
LM DES H2O - OPEN
Monitor PRIM Sight Glass,
Verify Gas Expelled - 10 Sec Max
LM DES H2O - CLOSE
Connect WMS To PLSS AUX Vent
LM DES H2O - OPEN
Monitor AUX Sight Glass,
Verify Gas Expelled - 10 Sec Max
LM DES H2O - CLOSE
Disconnect And Stow WMS Hose
LM DES H2O - OPEN 5 Sec,
LM DES H2O - CLOSE
PLSS AUX H2O - CLOSE
Disconnect And Stow LM H2O Hose

Verify HI PLSS O2 FILL - CLOSED
Disconnect And Stow LM O2 Supply Hose
Stow PLSS Connector Covers
Set LMP PLSS On Mid-step

LMP Repeat O2 & H2O RECHARGE * * * *

LM DES H2O - OPEN
Set LMP PLSS Against Hatch

HTR CONT: URINE LINE - OFF
CB(11) HTR: URINE LINE - Open

Empty ETB As Follows:
Stow 1-HCEX Mag NN & 1-B&W Mag LL
In Aft RHSSC
Stow 3-16mm Mags CC, DD, EE In RHSSC,
Leave EE In ETB If Not Used
Stow EVA 1 Maps As Reqd
Stow Return Items In Purse

DATE 6/30/71

DATE 7/14/71

Stow In ETB:
- 1-70mm Camr(LMP's) With HCEX Mag KK (ETB)
- 1-70mm Camr(CDR's) With B&W Mag OO (ETB)
- 3-B&W Mags PP, QQ, RR (LCG Compt)
- 1-B&W Mag MM (ETB)
- 1-16mm Mag EE (ETB) If Not Used
- 3-16mm Mags FF, GG, HH (RHSSC)
- EVA 2 Maps + 1:25,000 EVA 2 Map

EVA DEBRIEFING WITH HOU (15 MIN)

Report Status Of PLSS Recharge

CREW STATUS REPORT

	CDR	LMP
MED	_____	_____
PRD	_____	_____

EAT PERIOD
129:05 TO 129:50
1739 TO 1824

Copy Liftoff Time In Data Book
For Rev 28-31

Configure ECS For Sleep
Stow LM O_2 Hoses, R/R & B/B
SUIT ISOL (BOTH) - SUIT FLOW
CABIN GAS RETURN - AUTO (Verify)
SUIT GAS DIVERTER - PUSH - CABIN (Verify)
Install Other Glove

PRESLEEP (15 MIN)

Stow Food As Reqd
Stow CSRC In ISA Top Pkt
Remove Fwd End Of ISS

Unroll CDR's Hammock With Sleep Restraint

Unroll LMP's Hammock With Sleep Restraint

LMP: Attach Straps To LH & RHSSC
Adjust Strap Tension LHSSC
Route Inboard Center Support Strap
Under LMP & CDR Comm Cables,
Attach To Vertical Handhold, ECS
Module

Attach Outboard Center Support
Strap To Lower ISA Fitting,
Straddle/Ingress

CDR: Attach Aft Straps - Z27
Route Hammock Under Comm Cable
Attach Fwd Straps, Panel 1 & 2
Adjust Strap Tension

Attach Outboard Center Support Strap
To Horizontal Handhold, ECS Module
Ingress Hammock
Attach Inboard Center Support Strap
To PLSS Donning Station, Upper
Outboard
Adjust Strap Tension

REST PERIOD
130:05 TO 137:55
1839 TO 0229

POSTSLEEP (15 MIN)
Crew Awake - Verify CWEA Status:
Caution: PREAMPS
COMM: TLM BIOMED - RIGHT

Restow Hammocks, Roll Up With
Sleep Restraints
Install ISS

STAY/NO STAY FOR EVA 2 PREP

CREW STATUS REPORT

	CDR	LMP
MED	_____	_____
PRD	_____	_____

Copy Liftoff Time In Data
Book For Rev 32-37

DATE 6/30/71

DATE 6/30/71

LM CONSUMABLES UPDATE

GET 138:00 CDT 0234

RCS A % ( ) ___ B ( ) ___

O2 DES 1% ( ) ___ 2 ( ) ___

O2 ASC 1% ( ) ___ 2 ( ) ___

H2O DES 1% ( ) ___ DES 2( ) ___

H2O ASC 1% ( ) ___ ASC 2( ) ___

AMP-HR DES ( ) ___ ASC ( ) ___

EVA 2 PLANNING WITH HOU (10 MIN)

Update EVA 2 & 3 Cuff Checklist
As Reqd (RHSSC)

PRO, V37E 06E, PRO
(STBY Lt - On)

EAT PERIOD
138:10 TO 138:55
0244 TO 0329

DON SUITS (45 MIN)

TLM BIOMED - OFF

* * * * LMP 1st: * * * *
AUDIO CB - OPEN
Stow LM Comm Cable
Unstow Comm Carrier (LHSSC), Stow Headset
Stow EVA 1 Cuff Checklist In Purse
Install EVA 2 & 3 Cuff Checklist (RHSSC)
Stow Gloves On Comm Panel
Stow Neckring Cover Aft RHSSC

CLEAN & LUB PGA
Wipe With Tissue, Lub With Pad From
EMU Maint Kit - Neckring, Wristring &
Gas Connectors
Lub Zippers With Pad

Fill Drink Bag - Evac, Install
Install Food Stick (Food Compt)

DOFF ICG
Stow ICG In Top Boot Comp

DOFF CWG
Stow CWG Adapter LHSSC
Disconnect Bio Belt Yellow & Blue Leads
Unsnap Belt & Remove
Stow CWG in ICG Pgh (LHMS)

DON LCG (Inside PGA)
Don UCTA
Snap Bio Belt To LCG
Connect Yellow & Blue Leads

DON PGA
Stow Jett Bag On PGA Legs In LHSSC
Stow LCG Plug In Purse
Connect UCTA, Bio Belt & LCG
Close Zippers & Lock
Don & Connect Comm Carrier
Stow PGA Elect Connector Cap In Purse

SUIT ISOL - SUIT DISC
Connect LM O2 R/B & B/R, H2O & Comm
SUIT ISOL - SUIT FLOW
SUIT GAS DIVERTER - PULL - EGRESS
CABIN GAS RETURN - EGRESS
AUDIO CB - CLOSE
Verify Comm

CDR Repeat DON SUITS * * * *

TLM BIOMED - LEFT
S-BD VOICE VOICE

DATE 6/30/71

DATE 5/10/71

139:40 CABIN PREP EVA 2
(0414)

Stow All Loose Items Not Reqd For EVA

Unstow EVA 2 Prep & Post Card

139:55 Stow Lunar Surface Checklist

EQUIPMENT PREP EVA 2

Stow PGA Gas Conn Plugs In Purse
Empty PGA Pockets Into Purse
PGA Relief Valve Cap In Pkt
Verify Watch On PGA

Unstow CDR OPS
Perform OPS Check (Both)
Stow Both OPS On Floor

Apply Antifog (Purse), Wipe Dry With Tissue (LHSSC)
Stow EMU Maintenance Kit In Purse
Stow LEVA's & Helmets On ISS
Stow Helmet Bag

Stow ETB On RH Eng Cover
Close BSLSS Bag, Stow On LH Eng Cover

Fwd Hatch Handle - UNLOCK

PLSS DONNING

* * * * LMP 1st: * * * *
Set PLSS On Mid-Step
Verify OPS Prey Decay
Unstow O2 Nozzle & Antenna Lead
Secure Flaps

Attach OPS To PLSS
Connect OPS Antenna Lead To PLSS
Verify Sublimator Exhausts Clear

Unstow PLSS Straps & Hoses
Remove Elect Dust Cap, Stow In Purse
Verify AUX H2O, DIVERTER, O2, & PRIM H2O - OFF

Verify The Following Locked:
PLSS Battery Connection
OPS Antenna lead To PLSS
OPS To PLSS

Don PLSS/OPS, Lift PLSS Hoses Above Lower Straps

Connect PLSS O2 Hoses To PGA
Verify AUX H2O, DIVERTER, O2, & PRIM H2O - OFF

Connect RCU To PGA & Upper Straps
Verify RCU Controls:
  PUMP, FAN - OFF (Left) MODE SEL-0
Connect RCU To PLSS

Unstow OPS O2 Hose & Actuator, Route
  Hose Behind PGA
Connect Actuator To RCU

CDR Repeat PLSS DONNING * * * *

PLSS COMM CHECK

Verify Powerdown CB Configuration
  (White Dots Out)
Verify Voice Comm With Hou

Audio (LMP)
  S-BAND - T/R
  ICS - T/R
  RELAY - ON
  MODE - VOX
  VOX SENS MAX
  VHF A - T/R
      B - RCV

COMM:
  VHF A XMTR - VOICE
      A RCVR - ON
      B XMTR - OFF
      B RCVR - ON
  TLM BIOMED - OFF
      PCM - LO
  SQUELCH VHF A&B -
    Noise Thres + 1 1/2
  RECORDER - ON
VHF Antenna - EVA
UPLINK SQUELCH - ENABLE

Audio (CDR)
  S-BAND - T/R
  ICS - T/R
  RELAY - OFF
  MODE - VOX
  VOX SENS MAX
  VHF A - T/R
      B - RCV

CB(16) COMM: SE AUDIO - Open
LMP Connect To PLSS Comm

CB(16) COMM: SE AUDIO - Close
PLSS PTT (LMP) - MAIN (Rt), Verify
PLSS Mode(LMP) - A., Wheel-CCW
(Tone-On, Vent Flag - P,
Press Flag - O, O2 Mom)
PLSS O2 Press Gage > 85%
LMP Comm Check With CDR And Hou

NOTE: Unstow PLSS Antenna If It
Transmits Garbled And/Or Loses TM

CB(11) COMM: CDR AUDIO - Open
CDR Connect To PLSS Comm

CB(11) COMM: CDR AUDIO - Close
Audio (CDR)
VHF A - OFF
VHF B - OFF

PLSS PTT (CDR) - MAIN (Rt), Verify
PLSS Mode(CDR) - B, Blade-CCW
(Tone-On, Vent Flag - P,
Press Flag - O, O2 Mom)
PLSS O2 Press Gage > 85%

NOTE: Crewman In Mode B Cannot
Hear Hou

LMP Check With CDR And Hou

PLSS Mode(LMP) - B, Blade-CCW(Tone-On)
PLSS Mode(CDR)-A, Wheel-CCW(Tone-On)
CDR Comm Check With LMP And Hou

PLSS Mode (Both) - AR (Tone-On)

NOTE: (AR) Wheel-Hou, Blade-EVA

Perform Comm & TM Check With Hou &
Comm Check With Each Other
Read PLSS O2 Qty to Hou

FINAL SYSTEMS PREP

CB(16) ECS: LCG PUMP - Close
LCG - Cold, As Reqd
CB(16) ECS: CABIN REPRESS - Close (Ver)
SUIT FAN ΔP - Open
SUIT FAN 2 - Open
Verify ECS Caution & H2O SEP COMP
Lts - On (~ 1 Min)

DATE 5/10/71

SUIT GAS DIVERTER - PULL-EGRESS(Verify)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT

LMP 1st # # #
SUIT ISOL - SUIT DISC
Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B
Retrieve Purge Valve (Purse)-
  Verify Closed, Lock Pin In & LO
Install Purge Valve In PGA R/R
PGA Diverter Valve - Vertical

CDR Repeat OPS CONNECT # # # #

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets With LEVA's, Check Drink
  Bag Position
Secure Tool Harness Self Doff Straps
  To LEVA's

LCG-Cold, As Reqd
CB(16) ECS: LCG PUMP - Open
Disconnect LM H2O Hose
Connect PLSS H2O Hose
Stow LM Hoses (CDR's To ECS Handhold)

Verify The Following:

Helmet & Visor	(1)	- Aligned & Adjusted
O2 Connectors	(3)	- Locked
Purge Valves	(1)	- Locked
H2O Connectors	(1)	- Locked
Comm Connectors	(1)	- Locked
PGA Diverter Vlv	(1)	- Vertical

Verify EVA CB Configuration
  (White Dots Out + EVA Decals)

Don EV Gloves & Verify:
  Wrist Locks (4) - Locked
  Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON (Rt)

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK

PLSS O2 - ON (Tone-On, O2 Flag-O)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Monitor Cuff Gage For
  1 Min, Report Decay)
PLSS O2 - ON (Cuff Gage 3.7-4.0
  Psig, Tone & O2 Flag May Come On)
Verify O2 Flag Clear

CABIN DEPRESS

Confirm Go For Depress From Hou
C8(16)ECS: CABIN REPRESS - Open
CABIN REPRESS Vlv - CLOSE

Ovhd Or Fwd Dump Vlv - OPEN Then AUTO @
  3.5 Psia (Verify Cuff Gage Does
  Not Drop Below 4.6 Psig)
Verify:
  Cabin At 3.5 Psia
  LM Suit Circuit Lockup At 4.3 Psia
  PGA > 4.6 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN
Verify:
  Tone-On & H2O Flag - A (1.2-1.7 Psia)
  PGA > 4.6 Psig & Decaying

Partially Open Fwd Hatch

DATE 5/10/71

FINAL PREP FOR EGRESS :03

PLSS PRIM H2O - OPEN (H2O Flag - Clear In 2-4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient
Verify:
PGA 3.7 To 4.6 Psig
CWEA Status:
Caution
PREAMPS
ECS

H2O SEP COMP LT - ON

Lower EV Visor :10

DATE 7/13/71

LMP-2 | EVA 2 | 7/6/71

EGRESS H2O XFER

PLSS TO LM H2O TRANSFER

Torso Tiedown - Loosen as reqd
PLSS Pump - OFF
Disconnect PLSS H2O
Connect LM H2O
CB(16) ECS: LCG Pump - CLOSE

LM TO PLSS H2O TRANSFER

CB(16) ECS: LCG Pump - OPEN
Disconnect LM H2O
Connect PLSS H2O
PLSS Pump - ON
Torso Tiedown - tighten as reqd

CDR-2 | EVA 2 | 7/6/71

EGRESS H2O XFER

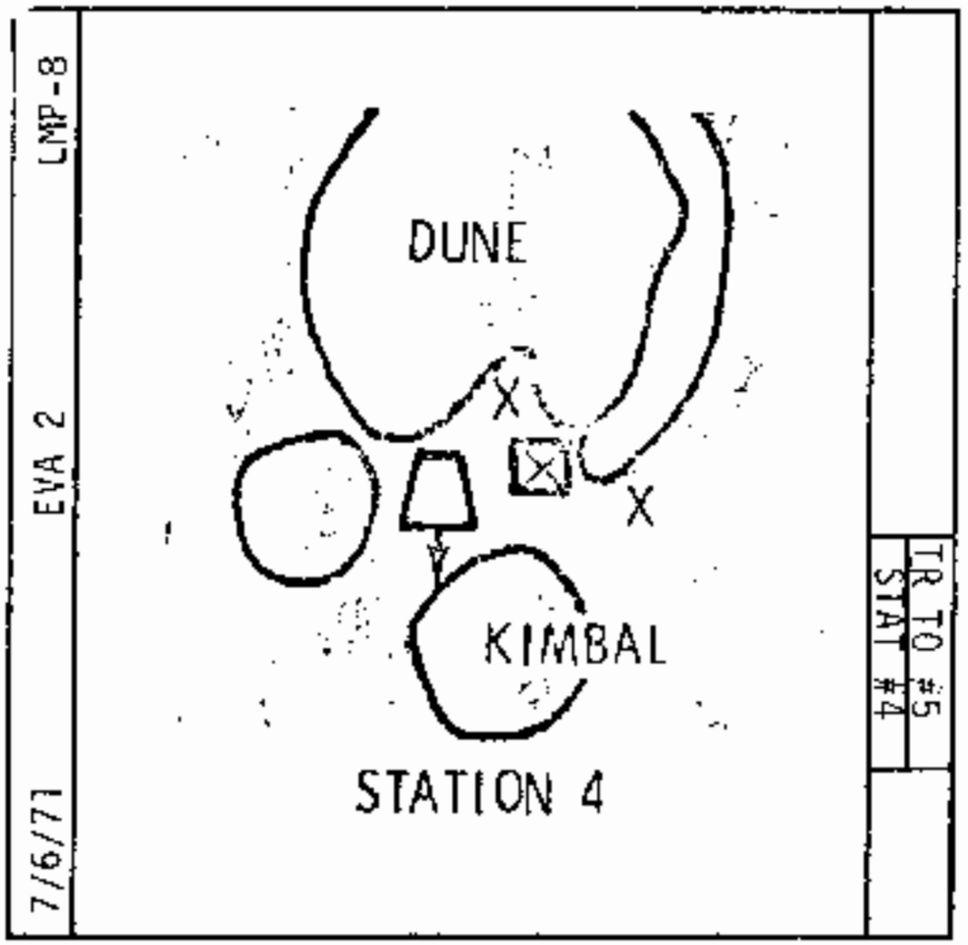
PLSS TO LM H2O TRANSFER

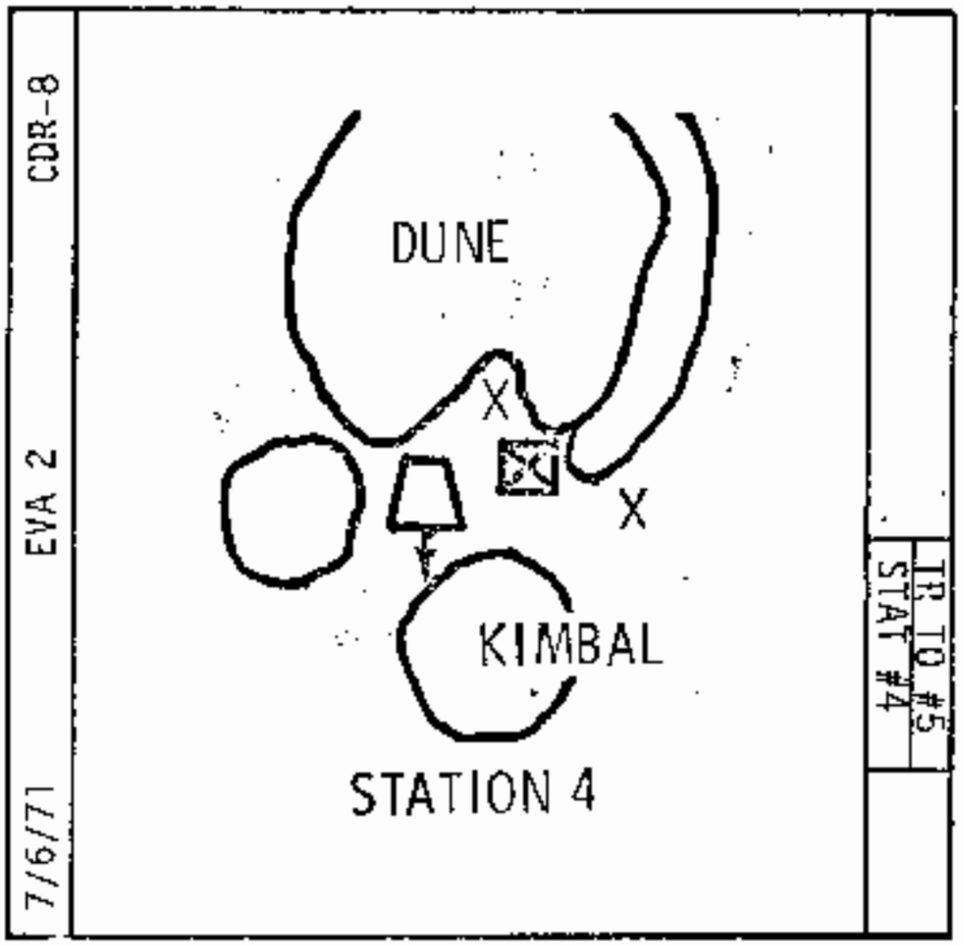
Torso Tiedown - Loosen as reqd
PLSS Pump - OFF
Disconnect PLSS H2O
Connect LM H2O
CB(16) ECS: LCG Pump - CLOSE

LM TO PLSS H2O TRANSFER

CB(16) ECS: LCG Pump - OPEN
Disconnect LM H2O
Connect PLSS H2O
PLSS Pump - ON
Torso Tiedown - tighten as reqd

DATE 7/13/71


LMP-8
EVA 2
7/6/71
DUNE
X
X
KIMBAL
STATION 4
TR TO #5
STAT #4


CDR-8
EVA 2
7/6/71
DUNE
X
X
KIMBAL
STATION 4
TR TO #5
STAT #4

STAT #4
TR TO #5

1+37 TRAVEL (0:10)

- Possible flow to west
- Mare/Front
- Front base
- Lateral variations
- Block Fields
- Patterned ground
- Rockslides/debris flows
- Blocky craters
- Large blocks

LMP-9 EVA 2 7/6/71

STAT #4
TR TO #5

1+37 TRAVEL (0:10)

- Possible flow to west
- Mare/Front
- Front base
- Lateral variations
- Block Fields
- Patterned ground
- Rockslides/debris flows
- Blocky craters
- Large blocks

CDR-9 EVA 2 7/6/71

DATE 7/13/71

DATE 7/13/71

LMP-10 | EVA 2 | 7/6/71

1+47 CP2 (0:04)(147°/0.39 to Spur)

1+51 TRAVEL (0:10)

- Access to Spur Crater (possible Stat.#7)
- Spur to CP3 (098°/0.75)
- Spur to Window (122°/1.41)
- Check distribution of secondary material

2+01 CP3 (0:04) (146°/0.81 to Window Crater)

STAT #5
TR 10 #5

CDR-10 | EVA 2 | 7/6/71

1+47 CP2 (0:04)(147°/0.39 to Spur)

1+51 TRAVEL (0:10)

- Access to Spur Crater (possible Stat. #7)
- Spur to CP3 (098°/0.75)
- Spur to Window (122°/1.41)
- Check distribution of secondary material

2+01 CP3 (0:04) (146°/0.81 to Window Crater)

TR 10 #5
STAT #5

TR TO #5
STAT #5

2+05 TRAVEL (0:05)
- Access to Window crater (Possible Station 6)
- (096°/1.11 to Front Crater)

2+10 CP4 (0:04)

2+14 TRAVEL (0:12)

2+26 Geology Station #5 (0:51)
- Documented samples South Rim of Crater Radial direction from north rim
- Trench/south rim
- Stereo pan-100m. along Frt (500mm) (70mm stereo upslope)

LMP-11 EVA 2 7/6/71

TR TO #5
STAT #5

2+05 TRAVEL (0:05)
- Access to Window crater (Possible Station 6)
- (096°/1.11 to Front Crater)

2+10 CP4 (0:04)

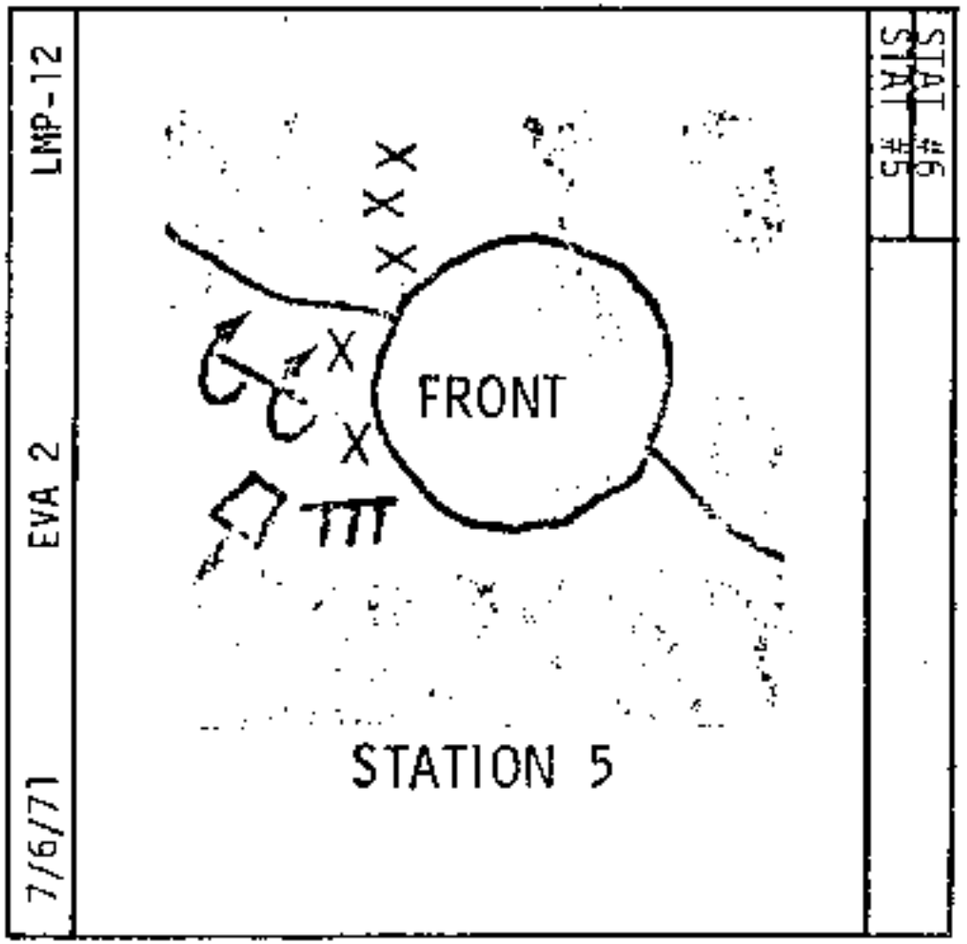
2+14 TRAVEL (0:12)

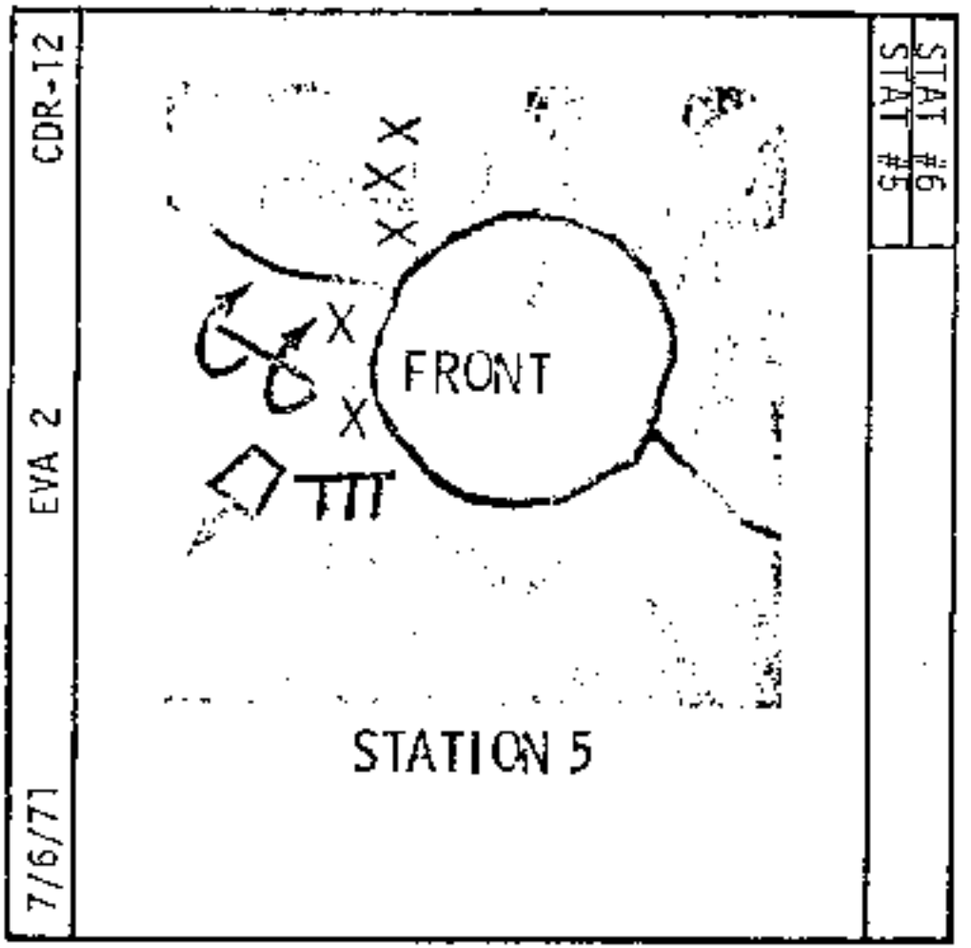
2+26 GEOLOGY STATION #5 (0:51)
- Documented samples South Rim of Crater Radial direction from north rim
- Trench/south rim
- Stereo pan-100m. along Frt (500mm.) (70mm stereo upslope)

CDR-11 EVA 2 7/6/71

DATE 7/13/71

DATE 7/13/71


7/6/71
EVA 2
LMP-12
STAT #5
STAT #6
FRONT
STATION 5


7/6/71
EVA 2
CDR-12
STAT #5
STAT #6
FRONT
STATION 5

STAT #5
STAT #6

3+17 TRAVEL (0:14)
- (Front to Window 276°/1.11)
- Return to Stat #6
- 16mm photos from LRV {f4;1/250, 12 fps}

3+31 Geology Station #6 (0:40)
- Possible stop Window crater
  - -Describe sample area
  - -Compare Front/other units
  - -Documented Samples
    - (Trench)
    - (Core tube)
    - (500mm)
    - (70mm stereo upslope)

4+11 TRAVEL (0:08)
- Return to Station 7
  (Window to Spur 303°/1.41)

LMP-13 EVA 2 7/6/71

STAT #5
STAT #6

3+17 TRAVEL (0:14)
- (Front to Window 276°/1.11)
- Return to Stat #6
- 16mm photos from LRV

3+31 GEOLOGY STATION #6 (0:40)
- Possible stop Window crater
  - —Describe sample area
  - —Compare Front/other units
  - —Documented Samples
    - (Trench)
    - (Core tube)
    - (500mm)
    - (70mm. stereo upslope)

4+11 TRAVEL (0:08)
- Return to Station 7
  (Window to Spur 303°/1.41)

CDR-13 EVA 2 7/6/71

DATE 7/13/71

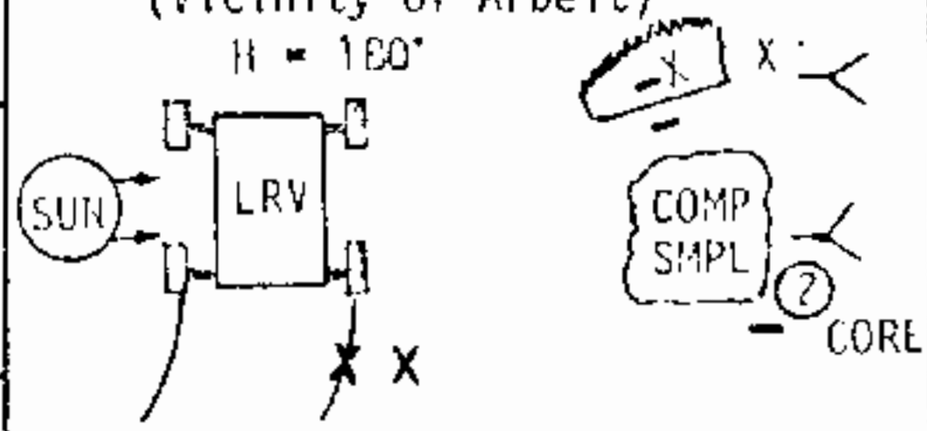
DATE 7/13/71

7/6/71 EVA 2 LMP-14	4+19 Geology Station #7 (0:40) •Possible stop Spur Crater •Same as Station 6 •Summarize Front Observation 4+59 TRAVEL (0:26) •Front/Mare •Block distribution •Secondary deposit dist •Patterned ground •Possible rock flows	STAT #7 STAT #8

7/6/71 EVA 2 CDR-14	4+19 GEOLOGY STATION #7 (0:40) •Possible stop Spur Crater •Same as Station 6 •Summarize Front Observation 4+59 TRAVEL (0:26) •Front/Mare •Block distribution •Secondary deposit dist •Patterned ground •Possible rock flows	STAT #7 STAT #8

STAT #8

5+25 Geology Station #8 (0:45)
(Vicinity of Arbeit)



- Comprehensive sample
- Double core sample
- Pan
- Soil mech trench
  - -SESC #1
  - -Samples
- Penetrometer Tests
  - -Soil mech trench
  - -Core tube site
  - - LRV track

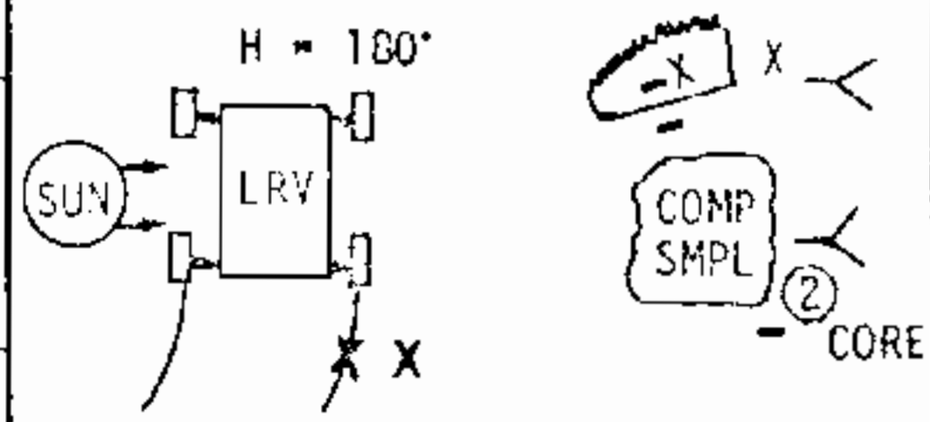
LMP-15

EVA 2

7/6/71

STAT #8

5+25 GEOLOGY STATION #8 (0:45)
(Vicinity of Arbeit)



- Comprehensive sample
- Double core sample
- Pan
- Soil mech trench
  - —SESC #1
  - —Samples
- Penetrometer Tests
  - —Soil mech trench
  - —Core tube site
  - —LRV track

CDR-15

EVA 2

7/6/71

DATE 7/13/71

DATE 7/13/71

LMP-16 | EVA 2 | 7/6/71

5+25 STATION #8
LRV system - readout
Dismount LRV
Rake - install on ext. handle
[CDR: Change 16mm mag]
[CDR: Place gnomon]

Comprehensive Sample
- LMP 70mm cam - to LRV
- Rake
- 1 bag rocks
- 1 bag soil

5+35 Double Core Tube Sample
[CDR: Photo]
[CDR: Place gnomon for trch]

STAT #8

CDR-16 | EVA 2 | 7/6/71

5+25 STATION #8

STOP
LCRU sel - FM/TV

16mm Cam - fresh mag
(f8;1/250;12 FPS)

Comprehensive Sample
- LMP 70mm cam - to LRV
- Rake
- 1 bag rocks
- 1 bag soil

5+35 Double Core Tube Sample
- X-Sun photos only
- 16mm Cam - fresh mag
(f8;1/250,12 FPS)

STAT #8

STAT #8

5+42 Soil Mechanics Trench
[CDR: Photo]

5+48 Sample trench
- SESC 75% full - to CDR C-Bag
- 1/2 bag: bottom, top, side

5+53 Clean trench bottom
[CDR: Install penetro cone]
Penetro - install on ext. hdle

LMP-17 EVA 2 7/6/71

STAT #8

5+42 Soil Mechanics Trench
- Photo: X-SUN; Dn-Sun
- Pan (70mm cam)(CDR)
- Collect samples (CDR)
(no gnomon)

Photo trench
- Vert. wall(X-Sun,7ft,stereo)
- Long axis(Dn-Sun,7ft,stereo)

5+48 Sample trench
- SESC 75% full - to CDR C-Bag
- 1/2 bag: bottom, top, side

[LMP: Clean trench bottom]
5+53 Install penetro 0.5 cone

CDR-17 EVA 2 7/6/71

DATE 7/13/71

DATE 7/13/71

LMP-18 | EVA 2 | 7/6/71

5+55 Penetrometer tests

#1- Adj. trench
[CDR: Photo]

#2- Trench bottom
[CDR: Photo]

#3- LRV track
[CDR: Photo]

#4- Adjacent to LRV track
[CDR: Photo]
[CDR: Install penetro plate]

#5- Core tube site
[CDR: Photo]

#6- Trench bottom
[CDR: Photo]

STAT #8

CDR-18 | EVA 2 | 7/6/71

5+55 Penetrometer tests

#1- Adj. trench
• Photo in surf (X-Sun, 7')

#2- Trench bottom
• Photo in surf (X-Sun, 7')

#3- LRV track
• Photo in surf(X-Sun, 7')

#4- Adjacent to LRV track
• Photo in surf (X-Sun, 7')

Install penetro plate (CDR)

#5- Core tube site
• Photo imprint(X-Sun,7'Stereo)

#6- Trench bottom
• Photo imprint(X-Sun,7'Stereo)

STAT #8

STAT #8

#7- Collapse trench side
(1/3 depth from edge)
[CDR: Photo]

6+08 Penetro - remove ext. handle
[CDR: Stow Penetro]
16mm cam - change mag
Mount LRV

6+10 Return to LM
- Ray/Secondaries
- Lineaments/Fillets/Mounds
- Block Distribution

LMP-19 EVA 2 7/6/71

STAT #8

#7- Collapse trench side
- Photo mtrl. or imprint
(X-Sun, 7', stereo)

6+08 [LMP: Remove ext. handle]
Stow penetro, cone on LRV
[LMP: Change 16mm Mag]
[LMP: Mount LRV]

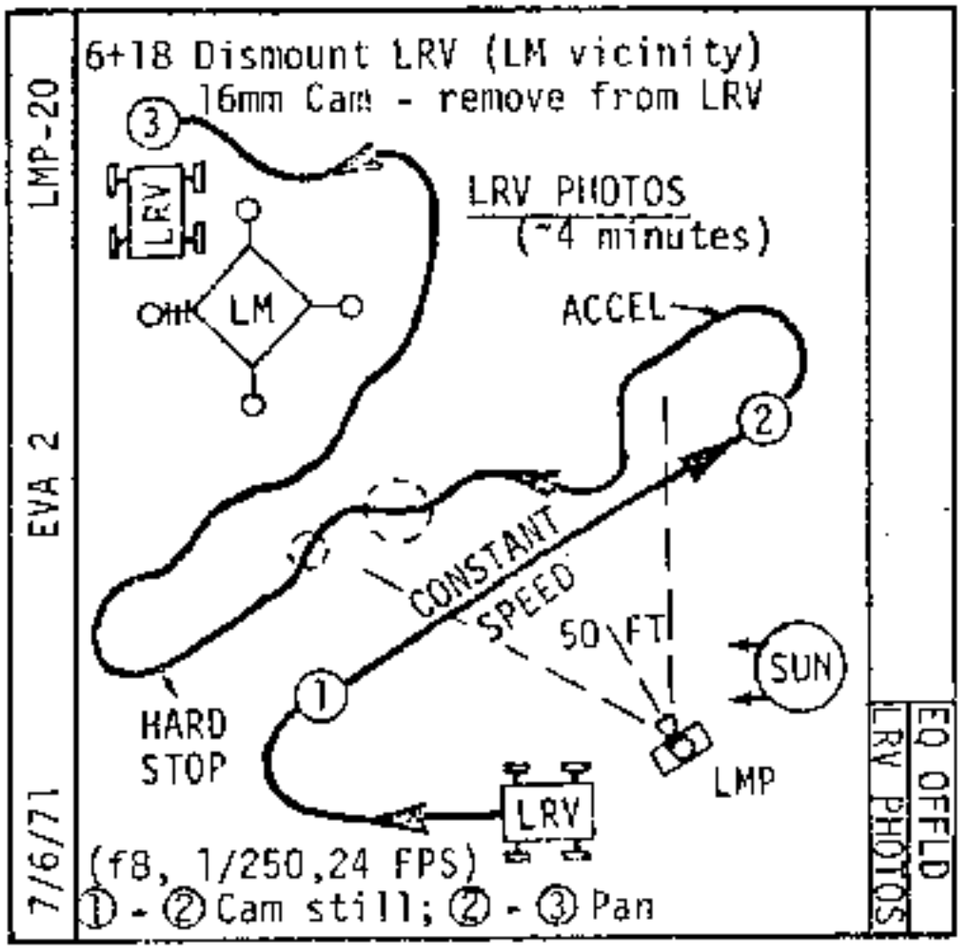
HGA - stow
LCRU - PM1/MB
[START]

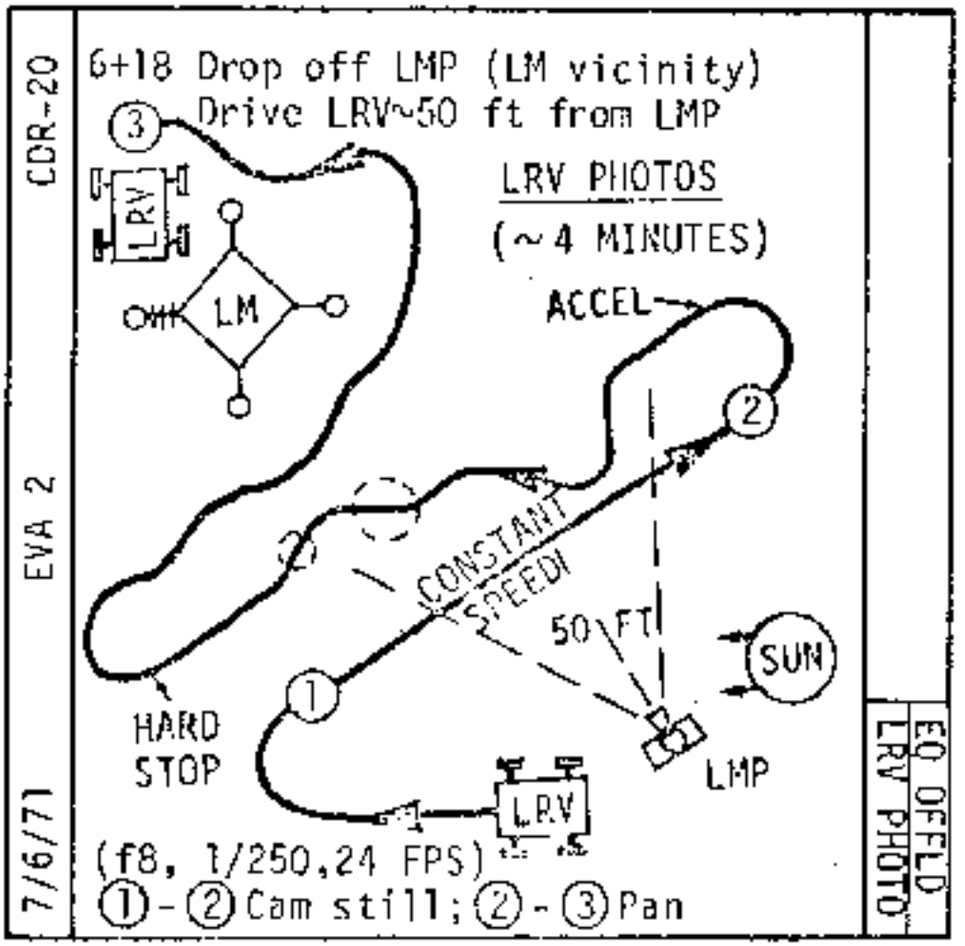
6+10 Return to LM
- Ray/Secondaries
- Lineaments/Fillets/Mounds
- Block Distribution

CDR-19 EVA 2 7/6/71

DATE 7/13/71

DATE 7/13/71


LMP-20
EVA 2
7/6/71
6+18 Dismount LRV (LM vicinity)
16mm Cam - remove from LRV
LRV PHOTOS
(~4 minutes)
LRV
LM
ACCEL
CONSTANT SPEED
50 FT
SUN
HARD STOP
LMP
LRV
(f8, 1/250,24 FPS)
① - ② Cam still; ② - ③ Pan
EQ OFFLD
LRV PHOTOS


CDR-20
EVA 2
7/6/71
6+18 Drop off LMP (LM vicinity)
Drive LRV~50 ft from LMP
LRV PHOTOS
(~4 MINUTES)
LRV
LM
ACCEL
CONSTANT SPEED
50 FT
SUN
HARD STOP
LMP
LRV
(f8, 1/250,24 FPS)
① - ② Cam still; ② - ③ Pan
EQ OFFLD
LRV PHOTO

6+23 Return to MESA
16mm cam - install on LRV
LRV systems - readout
Pwr down CBs

Photo LRV; (f11,1/250,11 ft)
- •X-Sun (2)
- •Dn-Sun (1)

70mm Cam - to LMP seat
[CDR: tools from LMP PLSS]
Ext. handle/scoop - to HTC
C-Bag #5 - remove from CDR
Tidy velcro covers

C-Bag #5 - to SRC #2
Remove seal protectors
Close & seal SRC #2

C-Bag #2 - to MESA
C-Bag #6 - to MESA

LRV PHOTOS
EQ OFFLD

LMP-21
EVA 2
7/6/71

6+23 STOP at MESA - North, X-Sun

LCRU - TV RMT
HGA - align
LRV batt - open dust covers

70mm Cam - CDR seat
Remove from LMP PLSS:
- Core tube cap disp - discard
- Hammer - to HTC
- Core rammer - to HTC
- C-Bag #2 - to HTC (R)

Tidy velcro covers
[LMP: - Remove CDR C-Bag #5]
Tongs - to HTC

6+32 ETB - to LRV CDR floorpan
20-Bag Disps - to CDR bag
[LMP: Pack SRC #2]

LRV PHOTO
EQ OFFLD

CDR-21
EVA 2
7/6/71

DATE 7/13/71

DATE 7/13/71

LMP-22 | EVA 2 | 7/6/71

Unstow dust brush
6+38 Clean EMU's
Dust brush - Geo pallet
[CDR: stow LMP antenna]

LRV Check - all samples?

6+41 Ingress - carry C-Bag #6
Attach LEC
Transfer:
- SRC #2
- ETB

Stow equipment

Stow C-Bag #2 (from CDR)

Pass LEC to CDR
Assist CDR ingress

7+00 Close hatch

EVA 3-EGR INGRESS

CDR-22 | EVA 2 | 7/6/71

Reseau cover - to 500mm cam

Collect in ETB:
- 70mm cams (2) RR,QQ
- 70mm mags (3) KK,OO,PP
- 500mm cam mag - MM
- 16mm mags (4) EE,FF,GG,HH
- Maps

16mm Cam - Point North

6+38 Clean EMU's
LMP PLSS Ant. - Stow

ETB(empty) - to MESA table

[LMP: Ingress]

INGRESS ETB PACK

ETB PACK
INGRESS

Transfer:
- SRC #2
- ETB

Stow LEC

LCRU Pwr - OFF
LCRU blankets - 65% open

Clean EMU

6+54 Ascend ladder; carry C-Bag #2
Hand C-Bag #2 to LMP
Stow LEC on platform

Ingress

CDR-23
EVA 2
7/6/71

DATE 7/13/71

POST EVA 2

PLSS PRIM H2O - CLOSE
Fwd Hatch - Close & Lock
Dump Valves (Both) - AUTO

NOTE: PLSS O2 & PRESS Flags May Come On During Repress. If PLSS O2 <10% Manually Control Cabin Repress To Maintain Positive PGA Pressure. (Leave Cabin Repress CB Open For Manual Repress)

CABIN REPRESS - AUTO
CB(16)ECS: CABIN REPRESS - Close
MASTER ALARM & CABIN Warning Lt - On
Verify Cabin Press Increasing
PRESS REG A & B - CABIN

PLSS O2 - OFF @ Cabin > 2.5 Psia

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psia
Use Purge Valve To Depress PGA As Reqd

POST EVA SYSTEMS CONFIGURATION

Verify EVA CB Configuration (White Dots Out + EVA Decals)
CB(16) ECS: SUIT FAN 2 - Close
SUIT FAN ΔP- Close
ECS Caution & H2O SEP Comp Lts - Out

Doff Gloves, Stow On Comm Panel
Doff Helmets With Visors, Lower Shades, Stow In Helmet Bags

Verify Safety On Dump Valve
DES H2O Vlv - OPEN
Remove Purge Valve, Stow In Purse
Disconnect OPS O2 Hose

Connect LM O2 Hoses R/B & B/R
PGA Diverter Vlv - Horizontal

SUIT ISOL (Both) - SUIT FLOW
PLSS PUMP - OFF (Left)
PLSS FAN - OFF (Left)

Disconnect PLSS H2O From PGA
Connect LM H2O

PLSS Mode (Both) - O
AUDIO CB - Open
Connect To LM Comm

AUDIO CB - Close
AUDIO (CDR & LMP)
  VHF A - RCV
      B - OFF
  MODE - ICS/PTT
  RELAY - OFF

COMM:
VHF A XMTR - OFF
    A RCVR - ON
    B XMTR & RCVR - OFF
TLM BIOMED - RIGHT
VHF ANTENNA - AFT
UPLINK SQUELCH-OFF

PLSS O2 RECHARGE

Verify DES 2 O2 >56%

* * * * LMP 1st: * * * *
Connect LM O2 To PLSS
HI PLSS O2 FILL - OPEN Then CLOSE
  After 4 Min

PLSS Mode - AR (O2 QTY ~85%)
PLSS Mode - O

Disconnect LM O2

CDR Repeat O2 RECHARGE * * * *

Stow LM O2 Supply Hose

PLSS/OPS DOFFING

Disconnect OPS Actuator From RCU
Disconnect RCU From PGA
PLSS PUMP,FAN-OFF(LEFT)MODE SEL - O
Disconnect RCU From PLSS, Stow In
  LCG Bag (LHMS)

Disconnect PLSS O2 Hoses
Doff PLSS/OPS (LMP 1st)
Stow LMP PLSS On Floor
Stow CDR PLSS On Mid-Step
Stow OPS O2 Hose & Actuator
Disconnect OPS Antenna Lead

DATE 6/30/71

DATE 5/10/71

Unstow Jett Bag (LHSSC), Hang From
  CDR's LH Handhold
Install Gas Conn Plugs (Purse) In PGA
Install PLSS Elect Dust Cap (Purse)

CAUTION: Insure PLSS LiOH Carts & Batts
  Numbered 3 or 4 Replaced with 5 or 6.

CDR 1st: # # #
Change PLSS Batt, Stow In Jett Bag
Connect Cable to Battery
Stow PLSS Hoses & Straps

Disconnect Left End Of PLSS Tool Harness
Change LiOH Cart, Temp<130°, Read Cart
  Decal
Stow Used LiOH Carts Inside Canisters
Stow Canisters In Jett Bag
Install PLSS Tool Harness

Remove OPS & Stow Antenna Lead
Verify OPS O2 Press 5380 - 6380
Stow CDR OPS On Floor Under Purse
Stow CDR PLSS In Recharge Station

LMP PLSS To Mid-Step, Repeat Above ####

Stow LMP OPS On Floor Under Dump Vlv
Stow PLSS On Floor Against Hatch

POST EVA CABIN CONFIGURATION

148:55 BATT MGMT
(1329)
POWER/TEMP MON - ED/OFF
Check ED Volts A ___, B ___ (To Hou)
PWR AMP - PRIM
TLM PCM - HI
POWER/TEMP MON - LUN
BAT 2 - OFF/RESET; tb - bp
BAT L (LMP) - ON; tb - LMP
BAT 1 - OFF/RESET; tb - bp
POWER/TEMP MON - Check Bus Volts

Unstow Lunar Surface Checklist, 8-4
Stow EVA 2 Prep & Post Card

Stow ETB On RH Cabin Floor, Fwd

Unstow Scale (Bot RHSSC)
Stow Collection Bags #2 & 6 In Covers
#2 & 6 (Aft Eng Cover)
Weigh SRC & Collection Bags #2 & 6,
Record On 3-2 & Report To Hou
Stow Scale In RHSSC

Stow Collection Bags #2 & 6 Aft Eng Cover
Stow SRC In Upper Comp

Verify Powerdown CB Configuration
(White Dots Out)

On Hou Cue: TLM PCM - LO
PWR AMP - OFF

S-BD VOICE - ON VOICE BU

149:10 DOFF SUITS (30 MIN)
(1344)

TLM BIOMED - OFF

* * * * CDR 1st: * * * *
Empty UCTA (HTR)
SUIT ISOL - SUIT DISC
AUDIO CB - OPEN

DOFF PGA
Unstow Headset (LHSSC), Stow Comm Carrier
Stow LM O2, H2O & Comm
Install PGA Elect Connector Cap (Purse)
Disconnect LCG, Bio Belt & UCTA
Insert LCG Plug (Purse)
Close Inner & Outer Zipper
Attach Neckring Cover (Aft RHSSC)
Stow On Eng Cover, Neck Aft &
CDR On RH, Face Up
LMP On LH, Face Down
Install One Glove
Cover PGA Legs With Jett Bag (LHSSC)

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DRY PGA
Connect LM O2 Hoses, R/B & B/R
CABIN GAS RETURN - AUTO
SUIT GAS DIVERTER - PUSH - CABIN
SUIT ISOL - SUIT FLOW For ∿ 60 Min, Then
Configure ECS For Sleep

DOFF LCG
Disconnect Bio Belt Yellow & Blue Leads
Unsnap Belt & Remove
Stow LCG In Jett Bag
Stow UCTA For Drying

DON CWG (ICG Bag, LHMS)
Snap Bio Belt To CWG (Only CDR Data Reqd)
Connect Yellow & Blue Leads
Don CWG Adapter (LHSSC), Connect
Bio Belt

DON ICG (Top Boot Compt)
Don Headset
Connect CWG Adapter

Connect LM Comm
Audio CB - CLOSE
Verify Comm

LMP Repeat DOFF SUITS * * * *

TLM BIOMED - LEFT

149:35 5 MIN Before Transfer
(1409)
CB(11) HTR: URINE LINE - Close
HTR CONT: URINE LINE - HTR 1

On Call From CMP:
VHF A XMTR - VOICE
XMTR - OFF After Conversation

PLSS O2 & H2O RECHARGE (30 MIN)

Verify 1 Hr Elapsed Since Initial
  O2 Recharge (DES 2 O2 >56%)

Fold LMP's PGA Legs Over PGA Back

* * * * CDR 1st: * * * *
Connect LM O2 To PLSS
HI PLSS O2 FILL - OPEN Then CLOSE
  After 10 min

Perform Feedwater Recharge (Decal):

PLSS AUX H2O - OPEN
Connect WMS To PLSS H2O DRAIN
LM DES H2O - CLOSE
Connect LM H2O To PLSS H2O FILL
LM DES H2O - OPEN 3 Minutes, Verify
  Condensate Flow (Thru WMS Sight Glass)
LM DES H2O - CLOSE
Connect WMS To PLSS PRIM Vent
LM DES H2O - OPEN
Monitor PRIM Sight Glass,
  Verify Gas Expelled - 10 Sec Max
LM DES H2O - CLOSE
Connect WMS To PLSS AUX Vent
LM DES H2O - OPEN
Monitor AUX Sight Glass,
  Verify Gas Expelled - 10 Sec Max
LM DES H2O - CLOSE
Disconnect And Stow WMS Hose
LM DES H2O - OPEN 5 Sec,
  LM DES H2O - CLOSE
PLSS AUX H2O - CLOSE
Disconnect And Stow LM H2O Hose

Verify HI PLSS O2 FILL - CLOSED
Disconnect And Stow LM O2 Supply Hose
Stow PLSS Connector Covers
Set LMP PLSS On Mid-step

LMP Repeat O2 & H2O RECHARGE * * * *

LM DES H2O - OPEN
Set LMP PLSS Against Hatch

HTR CONT: URINE LINE - OFF
CB(11) HTR: URINE LINE - Open

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Empty ETB As Follows:
Stow 3-B&W Mags PP, QQ, RR In LCG Compt
Stow 1-B&W Mag OO In Aft RHSSC
Stow 1-HCEX Mag KK In Aft RHSSC
Stow 3-16mm Mags FF, GG, HH In RHSSC
Stow 1-16mm Mag EE, If Used On EVA 2, In RHSSC
Stow EVA 2 Maps As Reqd
Stow Return Items In Purse

Stow In ETB:
- 1-70mm Camr (CDR's) With B&W Mag SS (LCG Compt)
- 1-70mm Camr (LMP's) With HCEX Mag TT (LCG Compt)
- 1-B&W Mag UU (LCG Compt)
- 2-B&W Mag VV, WW (Fwd RHSSC)
- 1-B&W Mag MM (ETB)
- 2-16mm Mags II, JJ (LCG Compt)
- EVA 3 Maps

EVA DEBRIEFING WITH HOU (15 MIN)

Report Status Of PLSS Recharge

CREW STATUS REPORT

	CDR	LMP
MED	_____	_____
PRD	_____	_____

PRO, V37E 06E, PRO
(STBY Lt - ON)

EAT PERIOD
150:25 TO 151:10
1459 TO 1544

Copy Liftoff Time In Data Book For Rev 38-41

Configure ECS For Sleep
Stow LM O_2 Hoses, R/R & B/B
SUIT ISOL (BOTH) - SUIT FLOW
CABIN GAS RETURN - AUTO (Verify)
SUIT GAS DIVERTER - PUSH - CABIN (Verify)
Install Other Glove On PGA's

PRESLEEP (15 MIN)

Change LM ECS LiOH Cart
Stow Bkt & Used Cart In Jett Bag

Stow Food As Reqd
Remove Fwd End Of ISS

Unroll CDR's Hammock With Sleep Restraint

Unroll LMP's Hammock With Sleep Restraint

LMP: Attach Straps To LHSSC & RHSSC
Adjust Strap Tension LHSSC
Route Inboard Center Support Strap Under LMP & CDR Comm Cables, Attach To Vertical Handhold, ECS Module

Attach Outboard Center Support Strap To Lower ISA Fitting, Straddle/Ingress

CDR: Attach Aft Straps - Z27
Route Hammock Under Comm Cable
Attach Fwd Straps, Panel 1 & 2
Adjust Strap Tension

Attach Outboard Center Support Strap To Horizontal Handhold, ECS Module
Ingress Hammock
Attach Inboard Center Support Strap To PLSS Donning Station, Upper Outboard
Adjust Strap Tension

REST PERIOD
151:25 TO 158:25
1559 TO 2259

POSTSLEEP (15 MIN)
Crew Awake - Verify CWEA Status:
Caution: PREAMPS
COMM: TLM BIOMED - RIGHT
Stow Hammocks & Sleep Restraints In Jett Bag
Stow ISA Aft Engine Cover
Install ISS

STAY/NO STAY FOR EVA 3 PREP

CREW STATUS REPORT

	CDR	LMP
MED	_____	_____
PRD	_____	_____

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DATE 6/30/71

Copy Liftoff Time In Data
Book For Rev 42-47

LM CONSUMABLES UPDATE

GET 158:40 CDT 2314

RCS A	% ( )	____	B	( )	____
O2 DES	1% ( )	____	2	( )	____
O2 ASC	1% ( )	____	2	( )	____
H2O DES	1% ( )	____	DES 2	( )	____
H2O ASC	1% ( )	____	ASC 2	( )	____
AMP-HR DES	( )	____	ASC	( )	____

EVA 3 PLANNING WITH HOU (10 MIN)

Update EVA 2 & 3 Cuff Checklist As Reqd

EAT PERIOD
158:50 TO 159:35
2324 TO 0009

DON SUITS (45 MIN)

TLM BIOMED - OFF

* * * * LMP 1st: * * * *
AUDIO CB - OPEN
Stow LM Comm Cable
Unstow Comm Carrier (LHSSC), Stow Headset
Stow Gloves On Comm Panel
Stow Neckring Cover Aft RHSSC

CLEAN & LUB PGA
Wipe With Tissue, Lub With Pad From
EMU Maint Kit - Neckring, Wristring &
Gas Connectors
Lub Zippers With Pad

Fill Drink Bag - Evac, Install
Install Food Stick (Food Compt)

DOFF ICG
Stow ICG (Empty Pkts) In Jett Bag

DOFF CWG
Stow CWG Adapter LHSSC
Disconnect Bio Belt Yellow & Blue Leads
Unsnap Belt & Remove
Stow CWG In Jett Bag

DON LCG (ISA Big Pkt)
Don UCTA
Snap Bio Belt To LCG
Connect Yellow & Blue Leads

Stow In Jett Bag:
- 2 LCG Adapters (Aft RHSSC)
- Urine Receptacle
- 2 Extra Drink Bags (Food Compt)
- Used Food & Containers

DON PGA
Stow Jett Bag On PGA Legs In LHSSC
Stow LCG Plug In Purse
Connect UCTA, Bio Belt & LCG
Close Zippers & Lock
Don & Connect Comm Carrier
Stow PGA Elect Connector Cap In Purse

SUIT ISOL - SUIT DISC
Connect LM O2 R/B & B/R, H20 & Comm
SUIT ISOL - SUIT FLOW
SUIT GAS DIVERTER - PULL - EGRESS
CABIN GAS RETURN - EGRESS
AUDIO CB - CLOSE
Verify Comm

CDR Repeat DON SUITS * * * *

TLM BIOMED - RIGHT
S-BD VOICE - VOICE

160:15 BATT MGMT
(0049)
POWER/TEMP MON - ED/OFF
Check ED Volts A ___, B ___ (To Hou)
TLM PCM - HI
POWER/TEMP MON - BAT 1
BAT 1 HI V-ON; tb - gray
POWER/TEMP MON - BAT 2
BAT L (LMP) - OFF/RESET; tb - bp
BAT 2 - ON; tb - gray
BAT 3 - OFF/RESET; tb - bp
BAT L (CDR) - ON; tb - CDR
BAT 4 - OFF/RESET; tb - bp
POWER/TEMP MON - Check Bus Volts

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160:20 (0054) CABIN PREP EVA 3

Stow All Loose Items Not Reqd For EVA

Stow Page 3-2 In Purse

Unstow EVA 3 Prep & Post Card

160:35 Stow Lunar Surface Checklist

EQUIPMENT PREP EVA 3

Stow PGA Gas Conn Plugs In Purse
Empty PGA Pockets Into Purse
PGA Relief Valve Cap In Pkt
Verify Watch On PGA

Perform OPS Check (Both)

Apply Antifog (Purse), Wipe Dry With Tissue (LHSSC)
Stow EMU Maintenance Kit In Purse
Stow LEVA'S & Helmets On ISS
Stow Helmet Bag

Stow ETB on RH Eng Cover
Tie Jett Bag, Stow On LH Eng Cover

FWD Hatch Handle - UNLOCK

PLSS DONNING

* * * * LMP 1st: * * * *
Set PLSS On Mid-Step
Verify OPS Reg Decay
Unstow O2 Nozzle & Antenna Lead
Secure Flaps

Attach OPS To PLSS
Connect Antenna Lead To PLSS
Verify Sublimator Exhausts Clear

Unstow PLSS Straps & Hoses
Remove Elect Dust Cap, Stow In Purse
Verify AUX H2O, DIVERTER, O2 & PRIM H2O - OFF

Verify The Following Locked:
PLSS Battery Connection
OPS Antenna Lead To PLSS
OPS To PLSS

Don PLSS/OPS, Lift PLSS Hoses Above Lower Strap

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Connect PLSS O2 Hoses To PGA
Verify AUX H2O, DIVERTER, O2 &
  PRIM H2O - OFF

Connect RCU To PGA & Upper Straps
Verify RCU Controls:
  PUMP, FAN - OFF (Left) MODE SEL - 0
Connect RCU To PLSS

Unstow OPS O2 Hose & Actuator, Route
  Hose Behind PGA
Connect Actuator To RCU

CDR Repeat PLSS DONNING * * * *

PLSS COMM CHECK

Verify Powerdown CB Configuration
  (White Dots Out)
Verify Voice Comm With Hou

Audio (LMP)
  S-BAND - T/R
  ICS - T/R
  RELAY - ON
  MODE - VOX
  VOX SENS MAX
  VHF A - T/R
      B - RCV

COMM:
  VHF A XMTR - VOICE
      A RCVR - ON
      B XMTR - OFF
      B RCVR - ON
  TLM BIOMED - OFF
      PCM - LO
  SQUELCH VHF A&B -
    Noise Thres + 1 1/2
  RECORDER - ON
VHF Antenna - EVA
UPLINK SQUELCH - ENABLE

Audio (CDR)
  S-BAND - T/R
  ICS - T/R
  RELAY - OFF
  MODE - VOX
  VOX SENS MAX
  VHF A - T/R
      B - RCV

CB(16) COMM: SE AUDIO - Open
LMP Connect To PLSS Comm

CB(16) COMM: SE AUDIO - Close
PLSS PTT (LMP) - MAIN (Rt), Verify
PLSS Mode(LMP) - A, Wheel-CCW
(Tone-On, Vent Flag-P,
Press Flag-O, O2 Mom)
PLSS O2 Press Gage >85%
LMP Comm Check With CDR And Hou

NOTE: Unstow PLSS Antenna If It
Transmits Garbled And/Or Loses TM

CB(11) COMM: CDR AUDIO - Open
CDR Connect To PLSS Comm

CB(11) COMM: CDR AUDIO - Close
Audio (CDR)
VHF A - OFF
VHF B - OFF

PLSS PTT(CDR) - MAIN (Rt), Verify
PLSS Mode(CDR) - B, Blade-CCW
(Tone-On, Vent Flag- P,
Press Flag-O, O2 Mom)
PLSS O2 Press Gage >85%

NOTE: Crewman In Mode B Cannot
Hear Hou

LMP Comm Check With CDR And Hou

PLSS Mode(LMP)-B, Blade-CCW(Tone-On)
PLSS Mode(CDR)-A, Wheel-CCW(Tone-On)
CDR Comm Check With LMP And HOU

PLSS Mode (Both) - AR (Tone-On)

NOTE: (AR) Wheel-Hou, Blade-EVA

Perform Comm & TM Check With Hou &
Comm Check With Each Other
Read PLSS O2 Qty To Hou

FINAL SYSTEMS PREP

CB(16) ECS: LCG PUMP - Close
LCG - Cold, As Reqd
CB(16) ECS: CABIN REPRESS - Close (Ver)
SUIT FAN ΔP - Open
SUIT FAN 2 - Open
Verify ECS Caution & H2O SEP COMP
Lts - On ($\sim$1 Min)

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SUIT GAS DIVERTER - PULL-EGRESS(Verify)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT

LMP 1st: # # #
SUIT ISOL - SUIT DISC
Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B
Retrieve Purge Valve (Purse) -
  Verify Closed, Lock Pin In & LO
Install Purge Valve In PGA R/R
PGA Diverter Valve - Vertical

CDR Repeat OPS CONNECT # # # #

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets With LEVA's, Check Drink
  Bag Position
Secure Tool Harness Self Doff Straps
  To LEVA's

LCG - COLD, As Reqd
CB(16) ECS: LCG PUMP - Open
Disconnect LM H2O Hose
Connect PLSS H2O Hose
Stow LM Hoses (CDR's To ECS Handhold)

Verify The Following:

Helmet & Visor	(1)	- Aligned & Adjusted
O2 Connectors	(3)	- Locked
Purge Valves	(1)	- Locked
H2O Connectors	(1)	- Locked
Comm Connectors	(1)	- Locked
PGA Diverter Vlv	(1)	- Vertical

Verify EVA CB Configuration
  (White Dots Out + EVA Decals)

Don EV Gloves & Verify:
  Wrist Locks (4) - Locked
  Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON, Rt

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK

PLSS O2 - ON (Tone-On, O2 Flag - 0)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Monitor Cuff Gage For
  1 Min, Report Decay)
PLSS O2 - ON (Cuff Gage 3.7-4.0
  Psig, Tone & O2 Flag May Come On)
Verify O2 Flag Clear

CABIN DEPRESS

Confirm Go For Depress From Hou
CB(16)ECS: CABIN REPRESS - Open
CABIN REPRESS VLV - CLOSE

Ovhd Or Fwd Dump Vlv - OPEN Then AUTO @
  3.5 Psia (Verify Cuff Gage Does
  Not Drop Below 4.6 Psig)
Verify:
  Cabin At 3.5 Psia
  LM Suit Circuit Lockup At 4.3 Psia
  PGA > 4.6 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN
Verify:
  Tone-On & H2O Flag - A (1.2-1.7 Psia)
  PGA > 4.6 Psig & Decaying

Partially Open Fwd Hatch

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FINAL PREP FOR EGRESS :03

PLSS PRIM H20 - OPEN (H20 Flag - Clear In 2-4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient
Verify:
PGA 3.7 To 4.6 Psig
CWEA Status:
Caution
PREAMPS
ECS

H20 SEP COMP Lt - ON

Lower EV Visor :10

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INGRESS EVA 3-HGR

LMP - EVA 3

0+10 CDR PLSS Antenna - Deploy
Jett bag - place in hatch
LEC - to handhold
Recorder - OFF
VOX SENS (2) - MAX
CB Configuration - Verify
Utility & Flood Lts - OFF

ETB - transfer
Stow LEC

0+18 Egress
LM hatch - close
Descend
[CDR: deploy LMP antenna]

LCRU batt(+Y pad)-LMP fl/pan

LMP-23 EVA 2 7/6/71

CDR-24 EVA 3 7/6/71

CDR - EVA 3

0+10 Move thru hatch - Comm Ck.
PLSS Antenna - Deploy
Jett bag - Discard
LEC to LMP
Descend

ETB xfer
ETB - to MESA table
Stow LEC on ladder hook

ETB - to LRV CDR floorpan
LCRU pwr - INT

0+20 LMP PLSS antenna - Unstow

LCRU BATT EGRESS

LMP-24 | EVA 2 | 7/6/71

B-SLSS bag - to pallet front(R)
C-Bag #7 (LMP seat bag)-HTC(L)

20 bag disp-to CDR & LMP seat
0+29 C-Bag #8 - to HTC (R)
[CDR: - tools to LMP PLSS]

C-Bag #7 - to CDR PLSS

0+35 Tether scoop/ext handle
HTC - close & secure
20-Bag disp - to 70mm Cam
70mm Cam - to RCL

0+39 Mount LRV
Drive to NAV Init site
Initialize NAV system
Unstow maps

0+42 Drive to Sation A

GEO EQUIP | SEAT #4

EGRESS | LCRU BATT

ETB contents - to LRV
Mag "MM" - to 500mm Cam
P.O. Pkg. - leave in ETB

0+27 ETB(empty) - to MESA table

LCRU Batt - (LMP floorpan)
LCRU pwr - OFF
Change - LCRU batt
LCRU blankets - 100% open
0+31 LCRU pwr - INT

Olde LCRU batt - LRV

LRV CBs - closed (except AUX)

[LMP: Geo. pallet equip.]

CDR-25 | EVA 3 | 7/6/71

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7/6/71 EVA 3 CDR-26

0+32 Tether Tongs
Attach to LMP PLSS:
- C-Bag #8
- Core tube caps (HTC)
- Hammer
- Core rammer

[LMP:- C-Bag #7 - to CDR]
20-Bag disp - 70mm Cam
70mm Cam - to RCU

HGA - stow
LCRU - PMT/WB

0+39 START
Drive to NAV Init site
NAV ALIGN
LRV Systems - Reacout

0+42 Drive to Station 2

STAT #9
GEO EQUIP

GEO EQUIP | STAT #9

0-42 TRAVEL (0:07)
- Possible ray
- Fillets, lineaments, mounds
- Block distribution

0-49 SUPPLEMENTARY SMPL STOP (0:05)
- Soil/rock sample

0-54 TRAVEL (0:12)
- Mare/raised rille rim(levee)

1-06 Geology Station #9 (0:50)
- Describe rille rim and wall
- 500mm (Vert/Horiz/Targ. Op)
- Comprehersive Sple (away from Rille Rim)
- Documented Sample
- Core (Sirgle or double)
- Trench (soil)
- Doc. smple - Rim Crater (Scrap crater)
- Penetrometer

LMP-25 | EVA 3 | 7/6/71

GEO EQUIP | STAT #9

0+42 TRAVEL (0:07)
- Possible ray
- Fillets, lineaments, mounds
- Block distribution

0+49 SUPPLEMENTARY SMPLE STOP (0:05)
- Soil/rock sample

0+54 TRAVEL (0:12)
- Mare/raised rille rim(levee)

1+06 GEOLOGY STATION #9 (0:50)
- Describe rille rim and wall
- 500mm (Vert/Horiz/Targ. Op)
- Comprehensive sample (away from Rille rim)
- Documented sample
- Core (sirgle or double)
- Trench (soil)
- Doc. sample - Rim Crater (Scarp Crater)
- Penetrometer

CDR-27 | EVA 3 | 7/11/71

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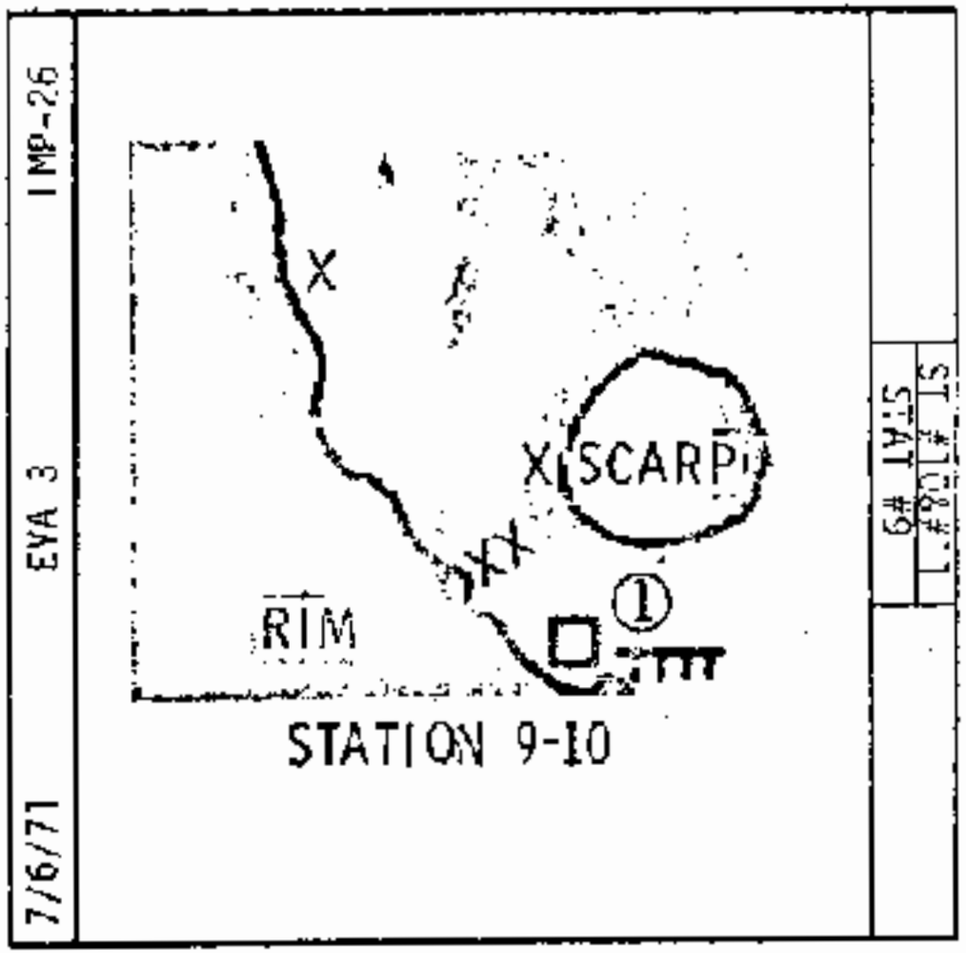
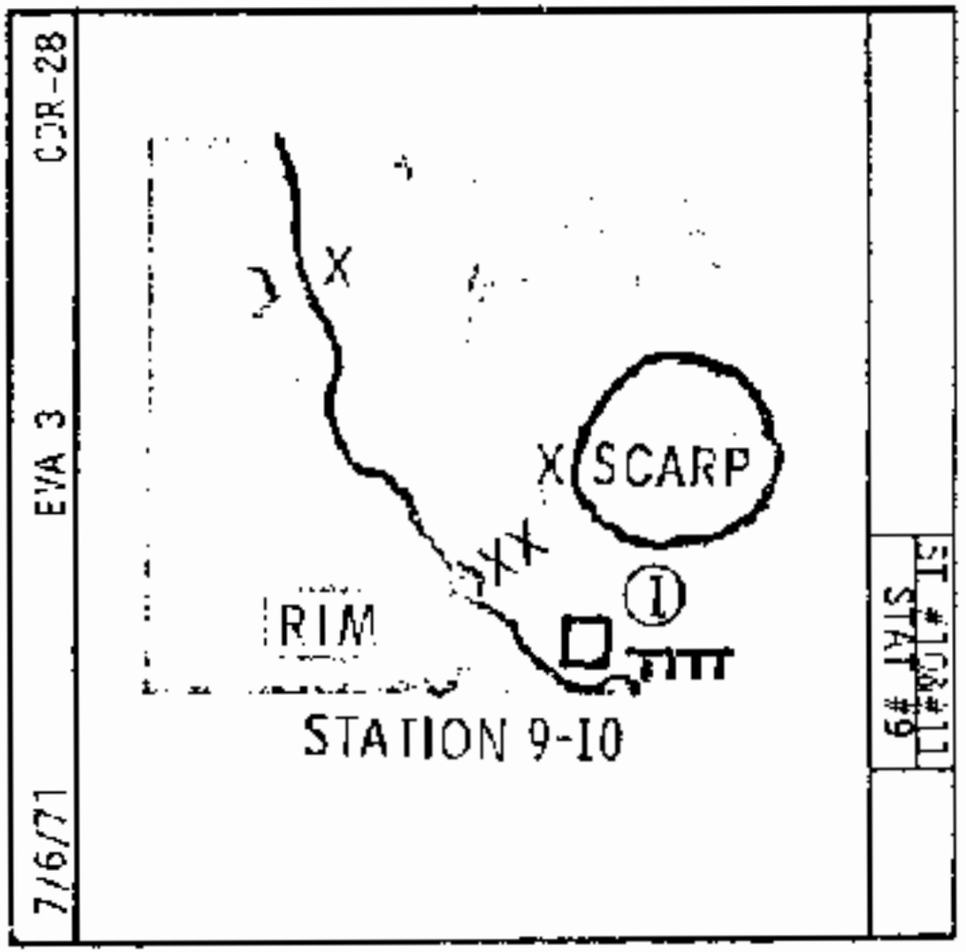

IMP-26
EVA 3
7/6/71
X
X
SCARP
XX
RIM
①
STATION 9-10
ST #10&#11
STAT #9


CDR-28
EVA 3
7/6/71
X
X
SCARP
XX
RIM
①
STATION 9-10
ST #10&#11
STAT #9

STAT #9
ST #10 & 11

1+56 TRAVEL (0:03)
- Changes in rim character
- Possible outcrops

1+59 Geology Station #10 (0:10)
- 500m
  Same targets as St. 9
- Documented sample at crater or rim

2+09 TRAVEL (0:06)
- Changes in rim character
- Possible outcrops

2+15 Geology Station #11 (0:19)
- Describe rille and far wall
- 500m (Vert/Horiz/Targ. Op)
- Documented Samples
  - -Rille rim
  - -South twin
- Compare rim mtrl to other

LMP-27 EVA 3 7/6/71

STAT #9
ST #10 & 11

1-56 TRAVEL (0:03)
- Changes in rim character
- Possible outcrops

1-59 GEOLOGY STATION #10 (0:10)
- 500m
  Same targets as St. 9
- Documented sample at crater or rim

2+09 TRAVEL (0:06)
- Changes in rim character
- Possible outcrops

2-15 GEOLOGY STATION #11 (0:19)
- Describe rille and far wall
- 500m (Vert/Horiz/Targ Op)
- Documented Samples
  - —Rille rim
  - —South twin
- Compare rim mtrl to other

CSR-29 EVA 3 7/6/71

DATE 7/13/71

DATE 7/13/71

LMP-28 EVA 3 7/9/71

GEOLOGY NOTES

STAT #12
GEO NOTES

7/9/71 EVA 3 CDR -30

GEOLOGY NOTES

STAT #12
GEO NOTES

GEO NOTES
STAT #12

2+34 TRAVEL (0:07)
- Rille rim/mare/North Cmplx
- Possible secondaries/ray
- Observe crater chain

2+41 SUPPLEMENTARY SMPL STOP (0:05)
- Soil/rock sample

2+46 TRAVEL (0:12)
- Mare/North Complex
- Possible secondaries/ray
- Observe crater chain

2+58 Geology Station #12 (0:23)
- Documented samples
  - Crater ejecta
  - Rim of Rio
  - North Complex Material
- Describe Chain/Link/Rio (Core tube)

MP-29 EVA 3 7/3/71

GEO NOTES
STAT #12

2+34 TRAVEL (0:07)
- Rille rim/mare/North Cmplx
- Possible secondaries/ray
- Observe crater chain

2+41 SUPPLEMENTARY SMPL STOP(0:05)
- Soil/rock sample

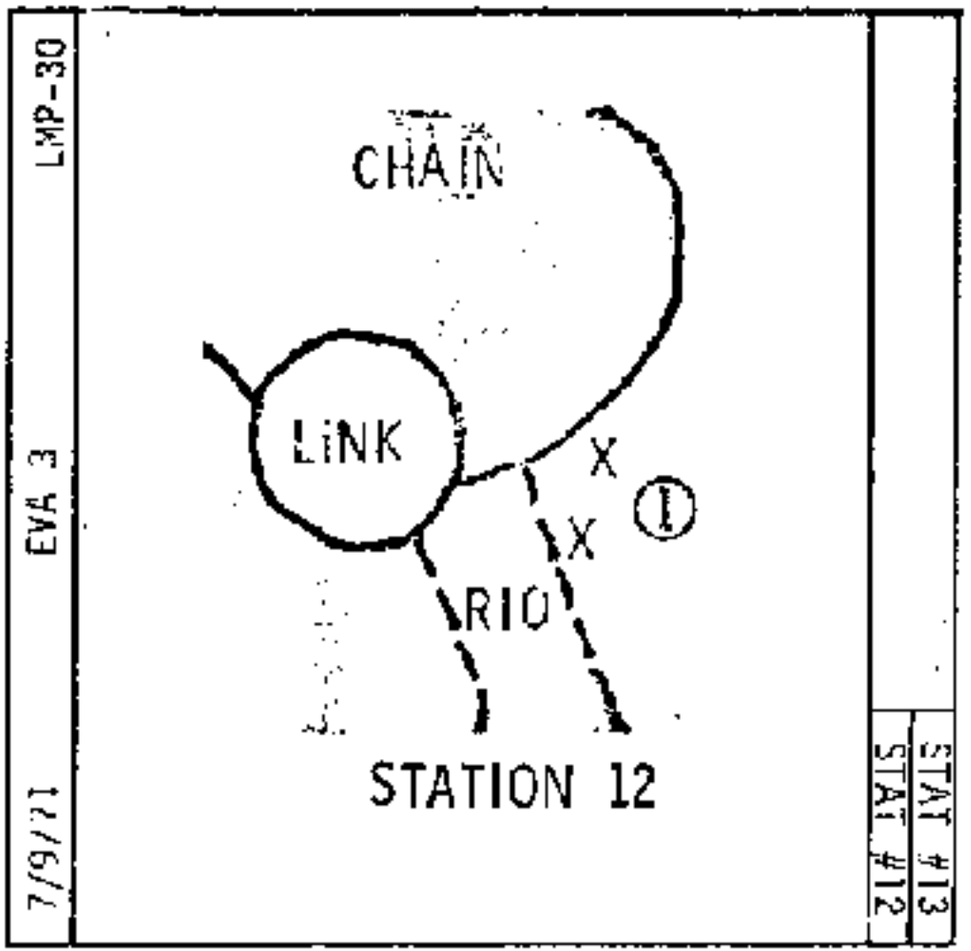
2+46 TRAVEL (0:12)
- Mare/North Complex
- Possible secondaries/ray
- Observe crater chain

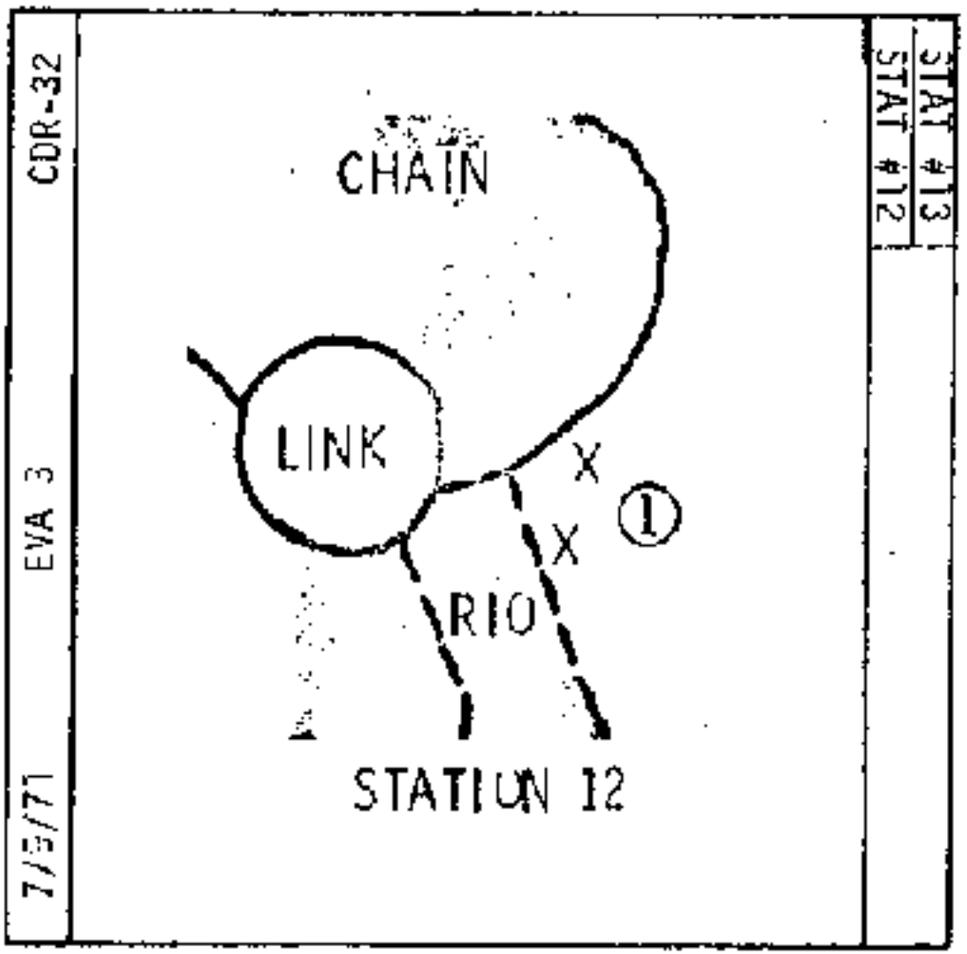
2+58 GEOLOGY STATION #12 (0:23)
- Documented samples
  - Crater ejecta
  - Rim of Rio
  - North Complex Material
- Describe Chain/Link/Rio (Core tube)

CDR-3 EVA 3 7/3/71

DATE 7/13/71

DATE 7/13/71


7/9/71
EVA 3
LMP-30
CHAIN
LINK
X
X
1
RIO
STATION 12
STAT #12
STAT #13


7/5/71
EVA 3
CDR-32
CHAIN
LINK
X
X
1
RIO
STATION 12
STAT #12
STAT #13

STAT #12
STAT #13

3+21 TRAVEL (0:08)
- Intercrater area
- Ejecta from chain
- North Cmplx/Mare relations

3+29 Geology Station #13 (0:50)
- Areas of Interest
  - -Pluton rim
  - -Icarus
  - -Observe Scarps to North
  - -Observe Eaglecrest
- Documented Samples
- Pans/Stereo Pans
  (Core)
  (500mm)
  (Trench/soil)
  (Penetrometer)

LMP-31
EVA 3
7/9/71

STAT #12
STAT #13

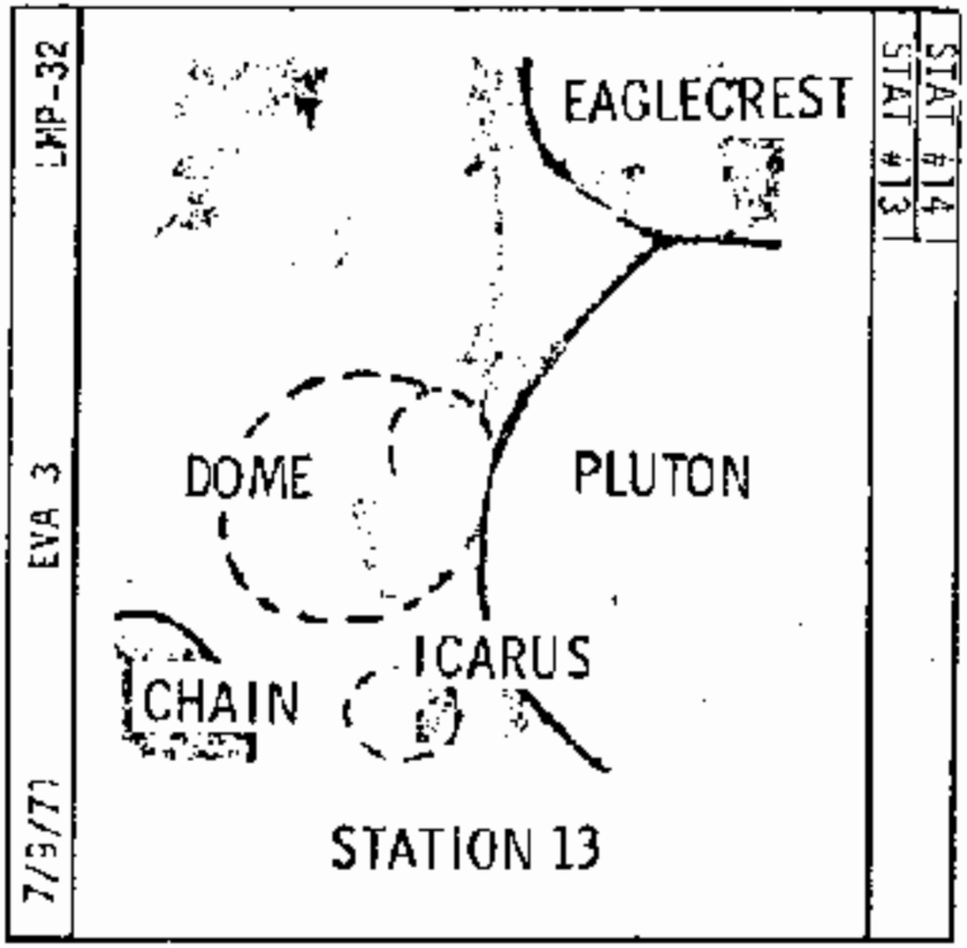
3+21 TRAVEL (0:08)
- Intercrater area
- Ejecta from chain
- North Cmplx/Mare relations

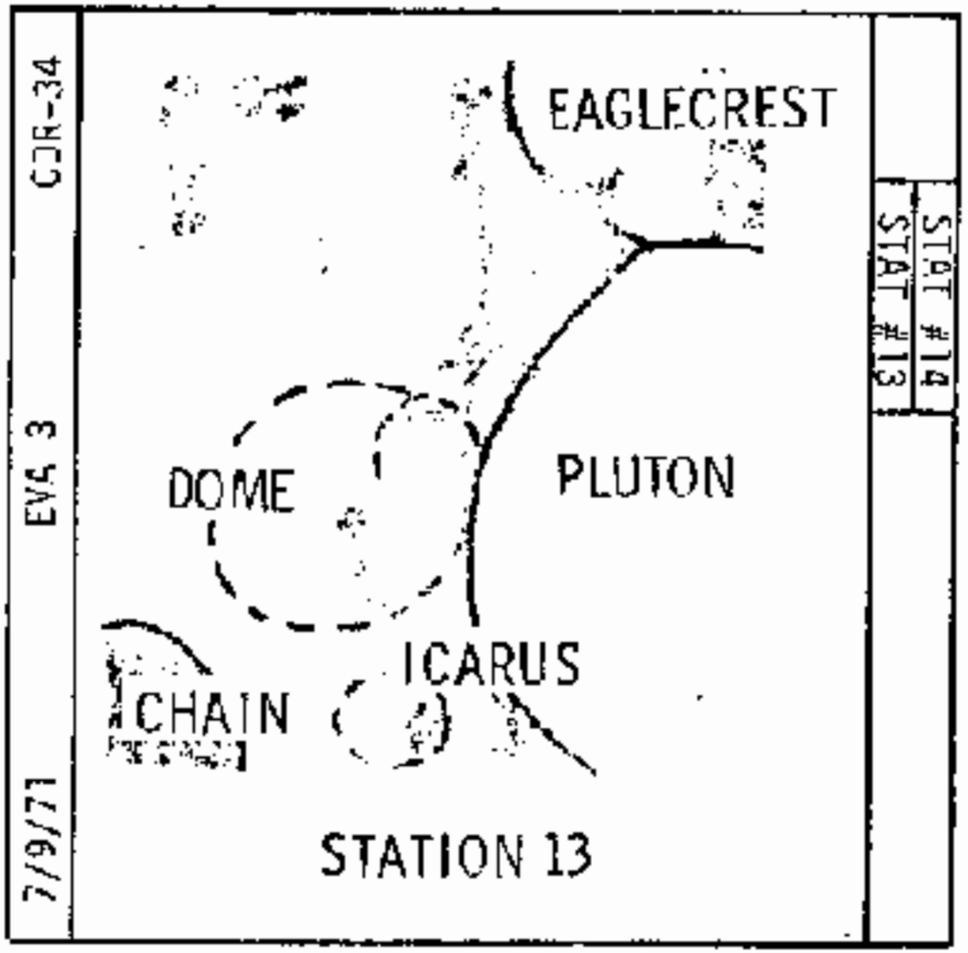
3+29 GEOLOGY STATION #13 (0:50)
- Areas of Interest
  - -Pluton rim
  - -Icarus
  - -Observe Scarps to North
  - -Observe Eaglecrest
- Documented Samples
- Pans/Stereo Pans
  (Core)
  (500mm)
  (Trench/soil)
  (Penetrometer)

CDR-33
EVA 3
7/9/71

DATE 7/13/71

DATE 7/13/71


LMP-32
EVA 3
7/9/71
EAGLECREST
DOME
PLUTON
ICARUS
CHAIN
STATION 13
STAT #14
STAT #13


CDR-34
EVA 3
7/9/71
EAGLECREST
DOME
PLUTON
ICARUS
CHAIN
STATION 13
STAT #14
STAT #13

STAT #13
STAT #14

4+19 TRAVEL (0:19)
- North Complex/Mare
- Secondaries/ray
- Epic crater

4+36 Geology Station #14 (0:18)
- Compare mare with No. Cmplx
- Documented Samples
  - -Ring crater
  - (Fillet/Rock sample)
  - (Equidimen rocks)
  - (Radial Sple - 5-10m crtr)
  - (Trench in ray material)

4+56 TRAVEL (0:14)
- Compare to earlier mare
- Secondaries/ray

LMP-33 EVA 3 7/9/71

STAT #13
STAT #14

4+19 TRAVEL (0:19)
- North Complex/Mare
- Secondaries/ray
- Epic crater

4+38 GEOLOGY STATION #14 (0:18)
- Compare mare with No. Cmplx
- Documented Samples
  - - Ring crater
  - (Fillet/Rock sample)
  - (Equidimen rocks)
  - (Radial Sple - 5-10m crtr)
  - (Trench in ray material)

4+56 TRAVEL (0:14)
- Compare to earlier mare
- Secondaries/ray

CDR-35 EVA 3 7/9/71

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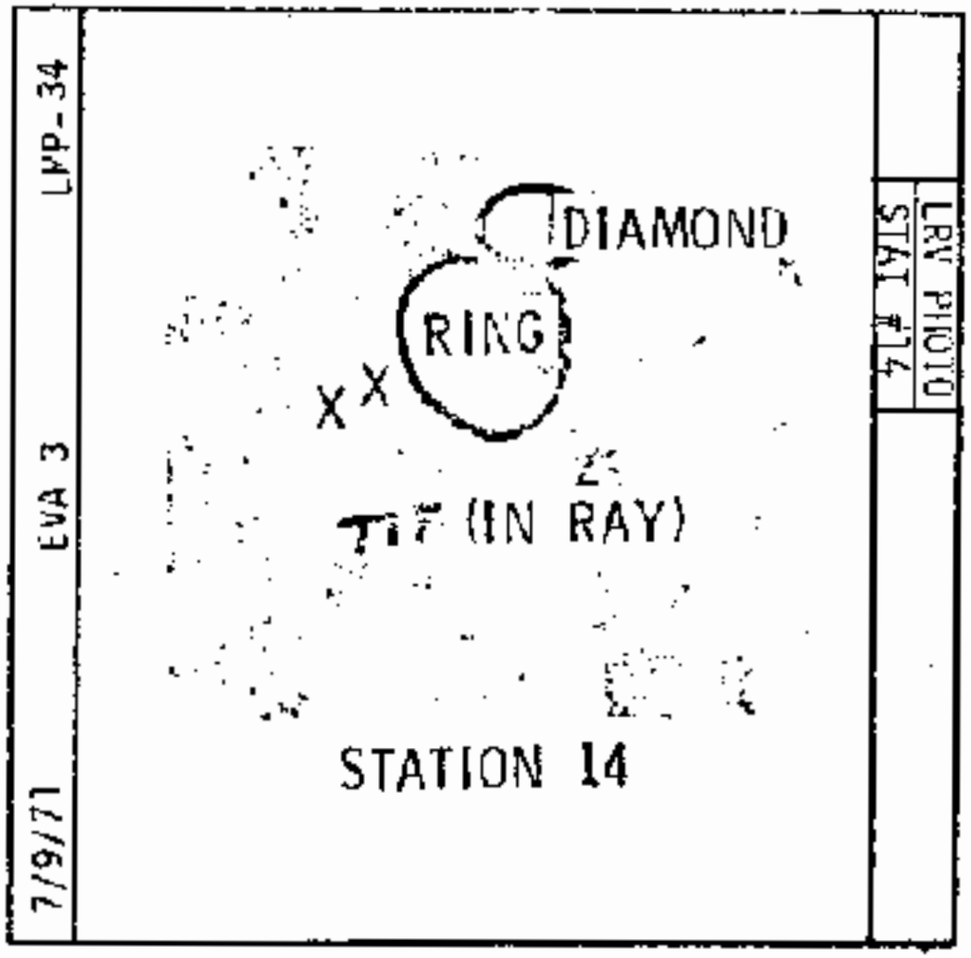
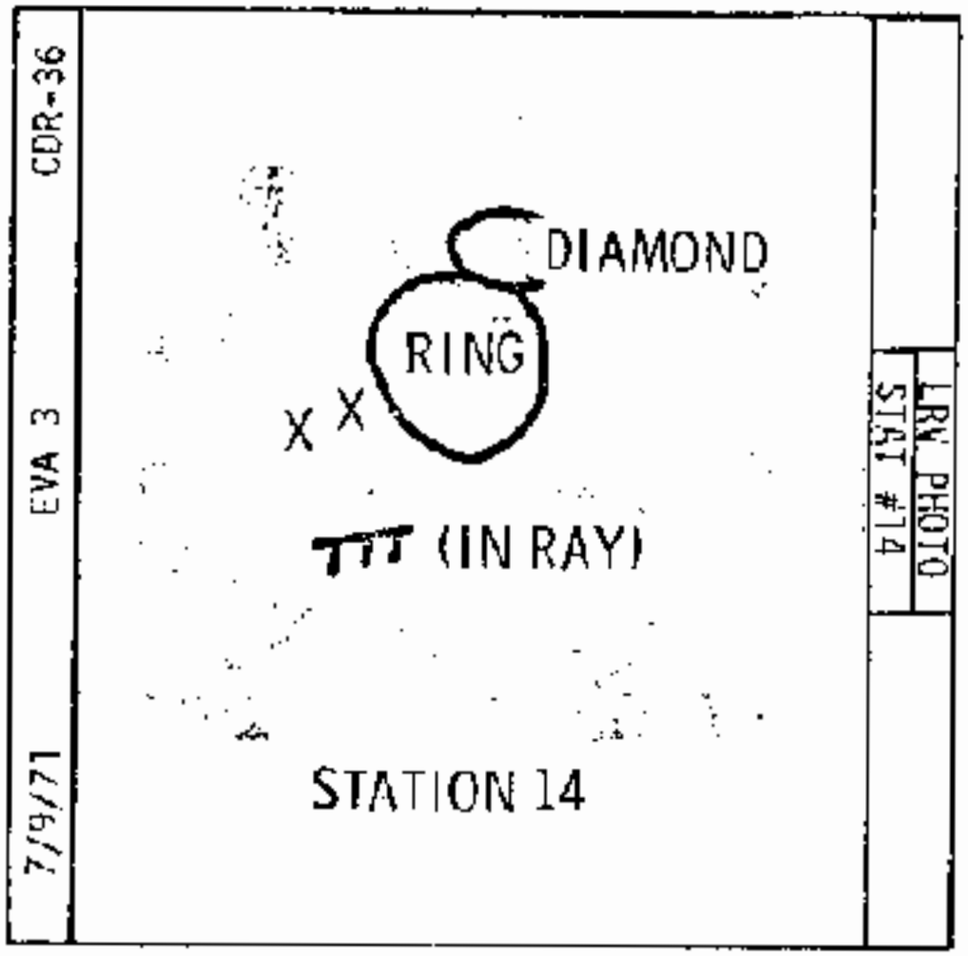
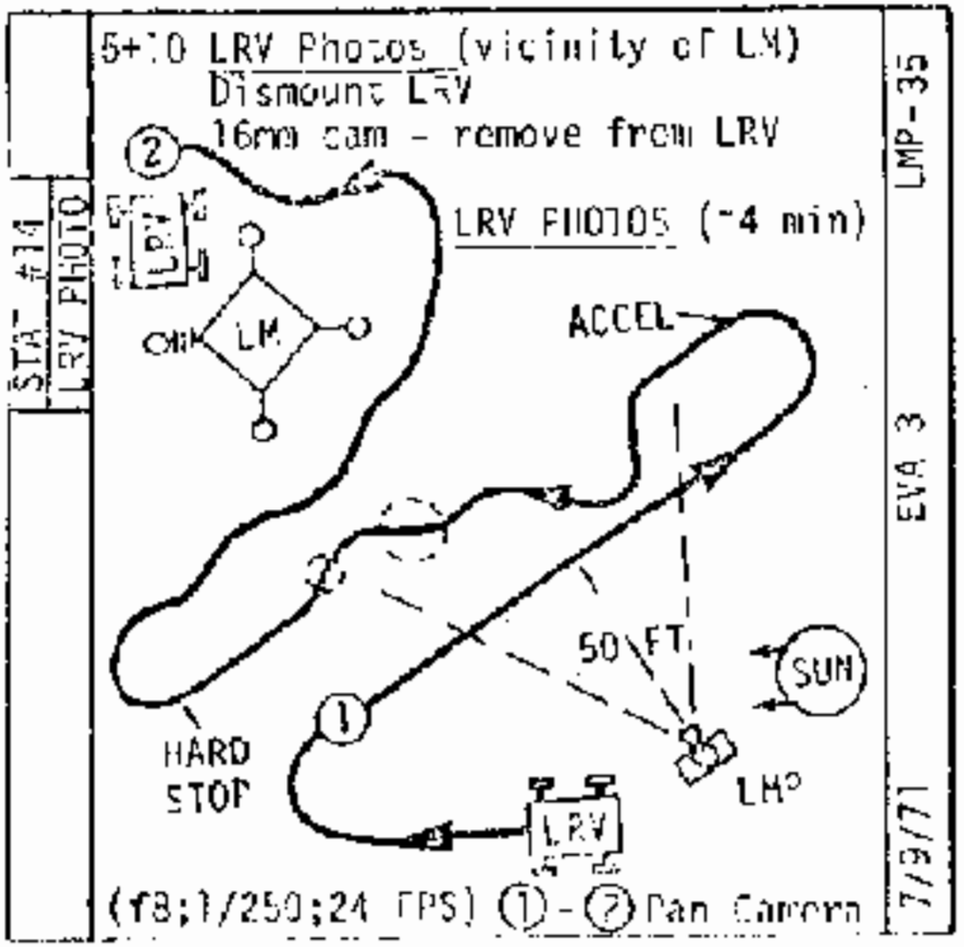
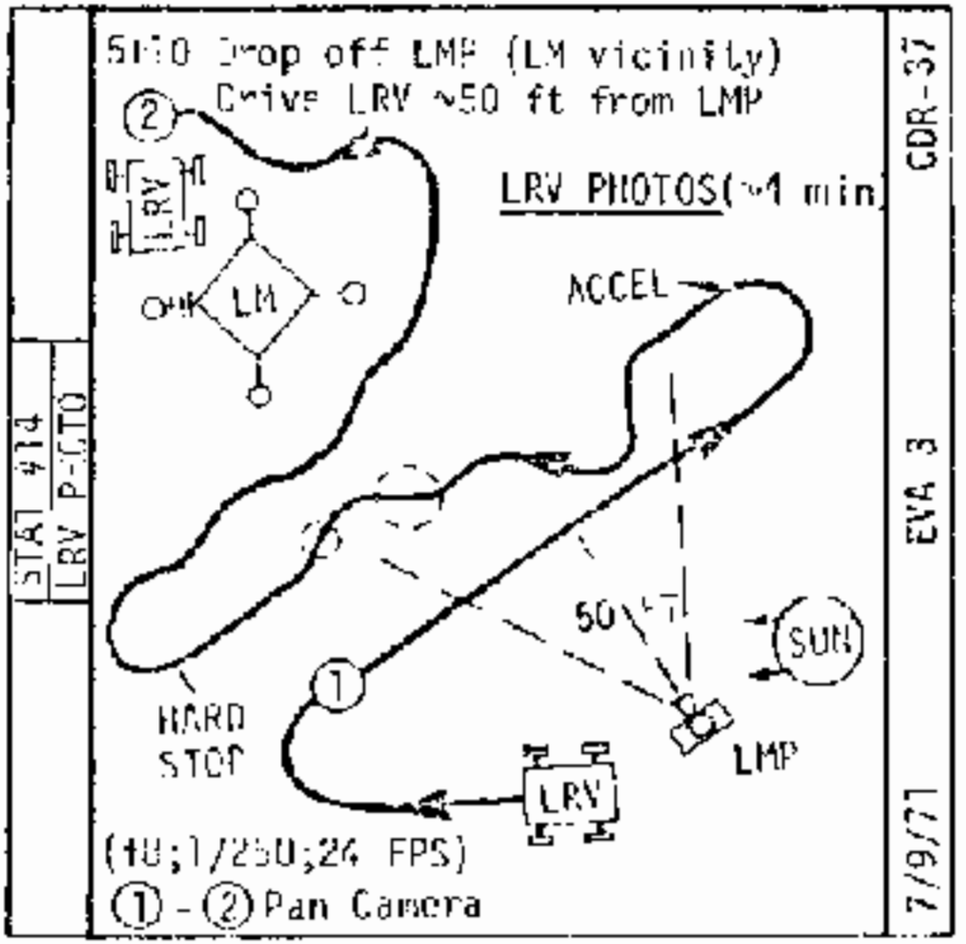

7/9/71
EVA 3
LMP-34
DIAMOND
RING
X X
TIT (IN RAY)
STATION 14
LRV PHOTO
STAT #14


7/9/71
EVA 3
CDR-36
DIAMOND
RING
X X
TIT (IN RAY)
STATION 14
LRV PHOTO
STAT #14


5+10 LRV Photos (vicinity of LM)
Dismount LRV
16mm cam - remove from LRV
LRV PHOTOS (~4 min)
ACCEL
50 FT
SUN
HARD STOP
LM
LRV
(f8;1/250;24 FPS) ① - ② Pan Camera
STA 414
LRV PHOTO
LMP-35
EVA 3
7/9/71


5+10 Drop off LMP (LM vicinity)
Drive LRV ~50 ft from LMP
LRV PHOTOS(~4 min)
ACCEL
50 FT
SUN
HARD STOP
LM
LRV
LMP
(f8;1/250;24 FPS)
① - ② Pan Camera
STA 414
LRV P-OTO
CDR-37
EVA 3
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LMP-36 | EVA 3 | 7/9/71

5+15 Return to MESA
16mm Cam - to LRV
LRV Systems - readout

Photo LRV;(f:11;1/250;11ft)
- •X-Sun (2)
- •Dn-Sun (1)

Photo SWC (Dn-Sun, f11, 7 ft)

Collect des. engine sample:
- •In SESC #2 (LMP seat bag)
  [CDR: SESC to LMP bag]

70mm Cam - to LMP seat
[CDR: - tools from LMP PLSS]
Remove C-Bag #7 from CDR PLSS
Tidy velcro covers

C-Bag #7 - to MESA table
C-Bag #8 - to MESA table
B-SLSS bag - to MESA

EC OFFLD | SWC/PHOTO

CDR-38 | EVA 3 | 7/9/71

5+15 STOP at MESA - North, X-Sun

LCRU - TV RMT
HGA - align
[LMP: Photo LRV & SWC]

Collect Des. engine sample:
- •In SESC #2 (LMP seat bag)

70mm Cam - to CDR seat
Remove from LMP PLSS:
- •Core tube cap disp-discard
- •Hammer - to HTC
- •Core hammer - to HTC
- •C-Bag #8 - to HTC (L)

Tidy velcro covers
[LMP: - Remove CDR C-Bag #7]
Tongs - to HTC

EC OFFLD | ETB PACK

DATE _____

CD CHFLD
SWC/PHOTO

5+27 LRV check! - all samples?
Dust brush - ladder hook

5+29 16mm Cam - retrieve from LRV
Change mag - if available

Photo CDR on LRV - 16mm cam
(f8;1250;24 FPS)
16mm Cam - to MESA

5+36 SWC - retrieve foil
SWC foil - to bag (MESA)
SWC bag - to ETB

Photo CDR return - 16mm Cam
16mm mag - to ETB

ETB - check contents

LMP-37 EVA 3 7/9/71

CD OFFLD
ETB PACK

P.U. Pkg - to MESA
ETB - to LRV CDR floorpan

Stow in ETB:
- Pentro drum in sample bag
- CDR 70mm cam; UU
- 70mm mags (4) SS,TT,VV,WW
- 500mm cam mag - MM
- 16mm mag (1) II
- Maps

5+30 ETB - to MESA table

P.U. Pkg - operate
- stow in ETB

HGA - stow
LCRU - PMT/WB

5+38 START
NAV sys. - RESET
[LMP: Photo CDR on LRV]

CDR-39 EVA 3 7/9/71

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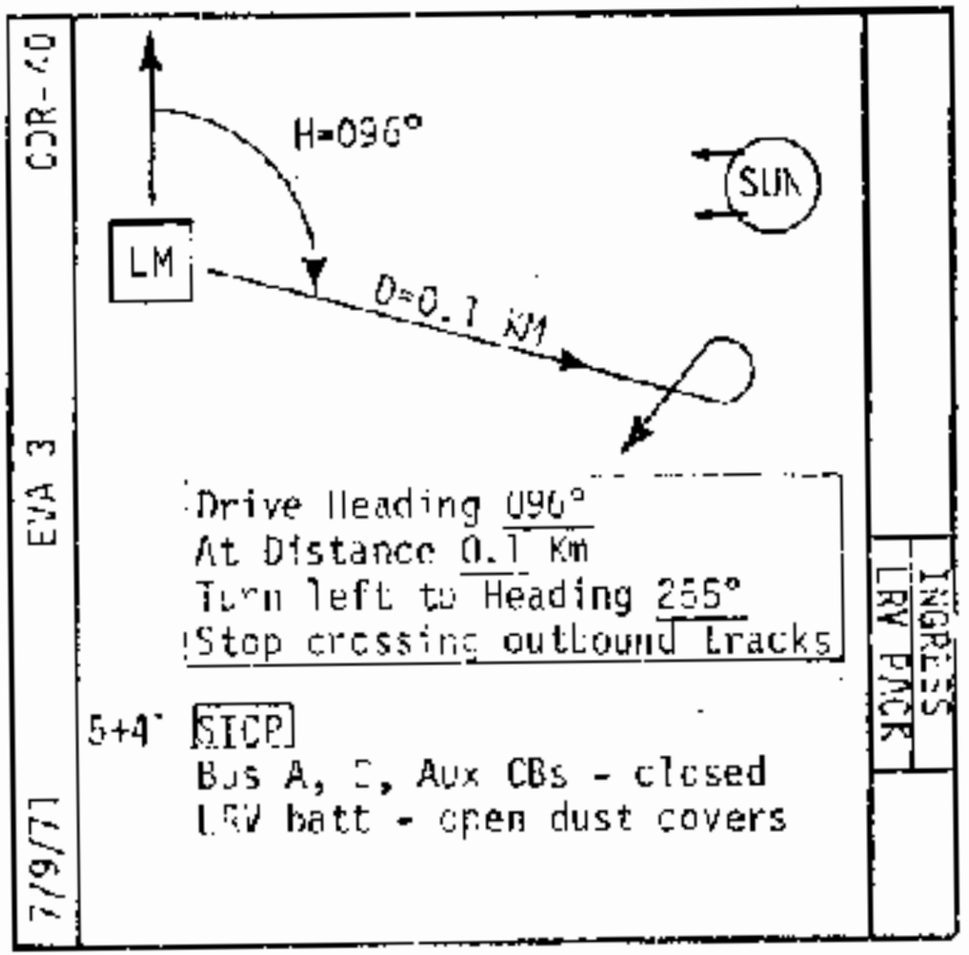
CDR-40
EVA 3
7/9/71
H=096°
SUN
LM
D=0.1 KM
Drive Heading 096°
At Distance 0.1 Km
Turn left to Heading 255°
Stop crossing outbound tracks
5+4' SICP
Bus A, B, Aux CBs - closed
LRV batt - open dust covers
INGRESS
LRV PACK

LMP-38 | EVA 3 | 7/9/71

5+47 Clean EMU's
[CDR: Stow LMP antenna]

Ingress - carry G-SLSS bag
Attach LEC
Transfer:
- C-Bag #7
- ETB

LEC - discard on porch
Stow equipment & samples

Stow C-Bag #8 (from CDR)

Assist CDR ingress

6+02 Close hatch

INGRESS

LRV PACK
INGRESS

LCRL Pwr - EXT
LCRL Sel - TV RMT

HGA - align
[LMP: Retrieve SWC]

5+45 Return to LM
[LMP: Photo CDR - Smile]
Clean EMUs
LMP PLSS onto - stow
Transfer:
- C-Bag #7
- ETB

Clean EMU
5+46 Ascend ladder; carry C-Bag #8
Hand C-Bag #8 to LMP
Discard LEC
Ingress

CDR-41 | EVA 3 | 7/9/71

DATE 7/13/71

LMP-38 | EVA 3 | 7/9/71

5+47 Clean EMU s
[CDR: Stow LMP antenna]

Ingress - carry B-SLSS bag
Attach LIC
Transfer:
- C-Bag #7
- ETB

LEC - discard on porch
Stow equipment & samples

Stow C-Bag #8 (from CDR)

Assist CDR ingress

6+02 Close hatch

INGRESS

LEW PALK
INGRESS

LCRL Pwr - EXT
LCRL Sel - TV RMT

HGA - align
[LMP: Retrieve SWC]

5+45 Return to LM
[LMP: Photo CDR - Smile]
Clean LMPs
LMP PLSS ant. - stow
Transfer:
- C-Bag #7
- ETB

Clean LMJ
5+46 Ascend ladder; carry C-Bag #8
Hand C-Bag #8 to LMP
Discard LEC
Ingress

CDR-41 | EVA 3 | 7/9/71

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CDR & LMP CUFF CHECKLIST

EMU MALFUNCTIONS

EMU 1: Vent Flag-P, Tone-On
Fan-Off/On
If Flag Still On After 10 Sec:
OPS O2-On, Purge Vlv-LOW
(Fan Fail)

EMU 2: Pres Flag-O, Tone-On
OPS O2-On, Pres Flag-Off
(Leak Or PLSS Reg Fail)
If Flag Still On: Ck Cuff Gage
>3.4, Ver TM, OPS O2-Off
(Pres Sensor Fail)

EMU 3: O2 Flag-O, Tone - On
Ck Cuff Gage & PLSS O2 Qty
If Cuff Gage >4.0: OPS O2 - On,
PLSS O2 - Off (PLSS Reg Fail)
If Cuff Gage <3.7 Or PLSS O2
Decr: OPS O2 - On (Leak)
If No Apparent Fail (O2 Sen Fail)

EMU 4: H2O Flag-A, Tone-On(Prim)
Ver Prim H2O - Open, If Open
Ver TM For Subl Restart Or Aux
H2O Act: Subl Restart: Prim H2O
Clsd, Diverter-MAX, Wait 5 Min,
Diverter-MIN, Prim H2O - Open,
Wait 4 Min Or H2O Flag Off,
Diverter As Desrd (Subl Brkthru)
Aux H2O Act: Diverter-MIN, Aux
H2O - Open, Wait 4 Min Or H2O
Flag Off, Diverter As Desrd
(Prim H2O Depletion)

If TM Does Not Ver Subl Brkthru
Or Prim H2O Depletion:
(H2O Press Sw Fail)
If Add'l Cooling Reqd, Act.
BSLSS (Subl Degrd) [If No BSLSS,
OPS O2 - On, Purge Vlv-Hi]
If Prim H2O - Clsd: Diverter-MIN,
Prim H2O - Open, Wait 4 Min Or
H2O Flag Off, Diverter As Desrd

EMU 4A: H2O Flag-A, Tone-On (Aux)
Ver Prim & Aux H2O-Open, If Open
& Add'l Cooling Reqd, Act.
BSLSS (Subl Degrd) [If No BSLSS,
OPS O2-On, Purge Vlv-Hi]
Ver TM For Subl Restart: Prim
H2O-Clsd, Diverter-MAX, Wait 5
Min, Diverter-MIN, Prim H2O-
Open, Wait 4 Min Or H2O Flag
Off, Diverter As Desrd
(Subl Brkthru)
If Prim Or Aux H2O-Clsd:
Diverter-MIN, Prim & Aux H2O
Open, Wait 4 Min Or H2O Flag
Off, Diverter As Desrd

EMU 5: Tone-On, No Flags
Ck Cuff Gage
If <3.4: OPS O2-On (Pres Flag
Fail & Leak Or PLSS Reg Shift)
If >3.4 & After Tone Off: Cycle
Mode Sel Sw, No Tone, No Fail.
If Tone On Again: Fan Off 5 Sec,
Ver Vent Flag-P, Then Fan-On.
If No Flag: OPS O2-On, Purge
Vlv-Low (Vent Flag & Fan Fail)
If PLSS O2 Decr: OPS O2-On
(O2 Flag Fail & Leak)

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Ver Prim H2O-Open. If Open & On Prim H2O, Ver TM For Subl Restart Or Aux H2O Act: (H2O Flag Fail)
Subl Restart: Prim H2O-Clsd, Diverter-MAX, Wait 5 Min, Diverter-MIN, Prim H2O-Open, Wait 4 Min, Diverter As Desrd (Subl Brkthru)
Aux H2O Act: Diverter-MIN, Aux H2O-Open, Wait 4 Min, Diverter As Desrd (Prim H2O Depletion)
If TM Does Not Ver Subl Brkthru Or Prim H2O Depletion(Tone Fail)
If Add'l Cooling Reqd, Act. BSLSS (Subl Degrd) [If No BSLSS, OPS O2-On, Purge Vlv-Hi]
If Prim H2O-Open & On Aux H2O, Ver Aux H2O-Open, If Open & Add'l Cooling Reqd, Act. BSLSS (Tone Or H2O Flag Fail Or Subl Degrd) [If No BSLSS, OPS O2-On, Purge Vlv-Hi]
Ver TM For Subl Restart: Prim H2O-Clsd, Diverter-MAX, Wait 5 Min, Diverter-MIN, Prim H2O Open, Wait 4 Min, Diverter As Desrd (Subl Brkthru)
If Prim Or Aux H2O-Clsd & On Aux H2O: Diverter-MIN, Prim & Aux H2O-Open, Wait 4 Min, Diverter As Desrd (H2O Flag Fail)

EMU 6: Cuff Gage <3.7, (All Other Indicators OK)
OPS O2-On, Cuff Gage Should Rise (PLSS Reg Shift)
If No Gage Incr, Ver TM, OPS O2-Off (Gage Fail)

EMU 7: PLSS O2 Qty Ind Abnormal
Ck Cuff Gage Or O2 Flag-O
If Cuff Gage >4.0, OPS O2-On, PLSS O2-Off (PLSS Reg Fail)
If Cuff Gage <3.7 Or O2 Flag-O, OPS O2-On (Leak)
If No Apparent Failure, Ver TM (Ind Or X-ducer Fail Or Leak)

EMU 8: Cuff Gage >4.0
If O2 Flag-O Or PLSS O2 Decr, OPS O2-On, PLSS O2-Off (PLSS Reg Fail)
If Neither, Ver TM (Gage Fail)

EMU 9: Loss Of Pump Noise
If No Side Tone, OPS O2 On, Purge Vlv-Clw, Act. BSLSS (Power Fail) [If No BSLSS, OPS O2-On & Purge Vlv-Hi]
If Sidetone OK, Ver Pump-On. If Add 1 Cooling Reqd, Act. BSLSS (Pump Fail) [If No BSLSS, OPS O2-On, Purge Vlv-Hi]

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EMU 10: Cooling Inadequate

Ver Diverter-MAX & Pump-On
Ver Prim & (If On Aux) Aux H20 Open: If Open, Act. Gas Trap 5 Sec, Wait 3 Min, If Add'l Cooling Reqd, Act. BSLSS (Flow Restr, Subl Or Pump Degrd, Or Heat Leak) [If No BSLSS, OPS O2-On, Purge Vlv-Hi]
Ver TM For Aux H20 Act: Diverter MIN, Aux H20-Open, Wait 4 Min, Diverter As Desrd (Prim H20 Depletion)
If Prim Or (If On Aux) Aux H20 Clsd: Diverter-MIN, Prim & (If On Aux) Aux H20-Open, Wait 4 Min, Diverter As Desrd (H20 Flag Fail)

EMU 11: Loss Of Voice Comm (LM)

Ck Vol Controls (Wheel-A-Hou, Blade-B-EVA)
Cycle PTT Sw-MAIN & MOM
CDR Mode Sel To B, LMP To A (Hand Signals)
If No Comm, CDR To A, LMP To B

LCRU 1: Loss of Voice Comm (LCRU)

If no comm between crewmen, perform EMU 11.
If no comm with MSFN:
- Ck Vol Control (Wheel-A-Hou)
- Repoint LCRU antenna
- Select alternate mode--
  - MODE - PM1/WB or FM/TV
  - Point selected antenna
- LCRU cb - close
- LRV AUX cb - close
- LCRU POWER Sw - EXT

BSLSS Don And Activate

1 Unstow BSLSS
2 Conn Tether Between Crewmen BSLSS H2O Flow Divider At Good PLSS
3 Remove Dust Cover From BSLSS H2O Flow Divider
4 Discon Good PLSS H2O From PGA
5 Conn BSLSS H2O Flow Divider To PGA With Good PLSS
6 Failed PLSS Pump-Off
7 Discon Failed PLSS H2O From PGA & Secure
8 Discon BSLSS H2O From BSLSS H2O Flow Divider
9 Conn BSLSS H2O To PGA With Failed PLSS
10 Conn Good PLSS H2O To BSLSS H2O Flow Divider

BSLSS Doff

1 Discon BSLSS From Failed PLSS PGA
2 Discon Tether From Both PGA's
3 Discon PLSS H2O From BSLSS
4 Discon BSLSS From PGA & Discard
5 Conn Good PLSS H2O To PGA
6 Ingress LM

NOTE: EMU Malfunction Procedures will be included in both the EVA 1 Cuff Checklist as well as in the EVA 2 and 3 Cuff Checklist.

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DATE 6/30/71

POST EVA 3

PLSS PRIM H2O - CLOSE
Fwd Hatch - Close & Lock
Dump Valves (Both) - AUTO

NOTE: PLSS O2 & PRESS Flags May Come On During Repress. If PLSS O2 <10% Manually Control Cabin Repress To Maintain Positive PGA Pressure. (Leave Cabin Repress CB Open For Manual Repress)

CABIN REPRESS - AUTO
CB(16)ECS: CABIN REPRESS - Close
MASTER ALARM & CABIN Warning Lt - On
Verify Cabin Press Increasing
PRESS REG A & B - CABIN

PLSS O2 - OFF @ Cabin > 2.5 Psia

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psia
Use Purge Valve To Depress PGA As Reqd

POST EVA SYSTEMS CONFIGURATION

Verify EVA CB Configuration
(White Dots Out + EVA Decals)
CB(16) ECS: SUIT FAN 2 - Close
SUIT FAN ΔP - Close
ECS Caution & H2O SEP Comp Lts - Out

Doff Gloves, Stow On Comm Panel

Verify Safety On Dump Valve
DES H2O VLV - OPEN
Remove Purge Valves, Stow In Purse
Disconnect OPS O2 Hose

Connect LM O2 Hoses R/R & B/B

SUIT ISOL (Both) - SUIT FLOW
PLSS PUMP - OFF (Left)
PLSS FAN - OFF (Left)

Disconnect PLSS H2O From PGA
Connect LM H2O To PGA

PLSS Mode (Both) - 0
AUDIO CB - Open
Connect To LM Comm

AUDIO CB - Close
AUDIO (CDR & LMP)
VHF A - RCV
B - OFF
MODE - ICS/PTT
RELAY - OFF

COMM:
VHF A XMTR - OFF
A RCVR - ON
B XMTR & RCVR - OFF
TLM BIOMED - RIGHT
PCM - HI
VHF ANTENNA - AFT

PLSS/OPS DOFFING

Disconnect OPS Actuator From RCU's
Disconnect RCU's From PGA
Verify Pump, Fan - OFF (Left) MODE SEL-0
Disconnect RCU From PLSS, Stow On RH Eng Cover

Disconnect PLSS O2 Hoses
Doff PLSS/OPS (LMP 1st)
Stow LMP PLSS On Floor
Stow CDR PLSS On Mid-Step
Stow OPS O2 Hose & Actuator
Disconnect OPS Antenna Lead

Unstow Jett Bag (LHSSC), Hang From CDR's LH Handhold
Install Gas Conn Plugs (Purse) In PGA

* * * * CDR 1st: * * * *
Remove OPS, Stow Antenna Lead
Perform OPS Checkout
Stow OPS On Eng Cover

Stow PLSS Hoses & Upper Straps
Remove Lower PLSS Straps, Clip Straps Together, D-Ring (Name-To-Name)
Remove Yo-Yo, Stow In Jett Bag

Stow Straps In Aft LHSSC
Stow PLSS On Floor

LMP PLSS To Mid-Step, Repeat Above ****

DATE 6/30/71

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Verify Powerdown CB Configuration
(White Dots Out)
CB(11) HEATERS: RR OPR - Close
RR STBY - Open

PREP FOR EQUIPMENT JETTISON

Stow Return Items In ISA Big Pkt
Unstow Scale (Bot RHSSC)

Stow Collection Bags #7 & 8 In Covers
#7 & 8 (Aft Eng Cover)
Weigh BSLSS/Rock Bag & Collection
Bags #7 & 8
Record On 3-2 (Purse) & Report To Hou

Weigh ISA (23#Max)
Stow Scale In RHSSC

Verify Total DES O2 QTY (Tank 1+2) > 20%

Fwd Hatch Handle - UNLOCK

Stow Helmet Bag In Jett Bag
Doff Lunar Boots, Stow In Jett Bag
Stow RCU's In Jett Bag
Remove Armrest, Stow In Jett Bag
Tie Jett Bag

Position PLSS's For Jettison, Eng
Cover & Mid-Step

Clean & Lub Wristrings As Reqd
PGA Diverter Vlvs - Horizontal
Don EV Gloves
Check PGA Connectors

PRESS INTEGRITY CHECK

NOTE: LM Suit Circuit Shall Not Be
Maintained At Elevated Press >5 Min

SUIT GAS DIVERTER - PULL-EGRESS (Ver)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS REG B - DIRECT O2
Monitor Cuff Gage To 3.7 - 4.0 Psig
Then PRESS REG B - EGRESS (Cuff
Gage Decay <.3 Psig In 1 Min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt
Press Decays To 4.8 Psia)

CABIN DEPRESS FOR JETTISON

Confirm Go For DEPRESS From Hou
CB(16)ECS: CABIN REPRESS - Open
Ovhd Or Fwd Dump Valve - OPEN Then AUTO
At 3.5 Psia
(Verify Cabin Press 3.5 Psia
& LM Suit Circuit Lockup At 4.3
Psia & Decaying)

Ovhd Or Fwd Dump Vlv - OPEN (Verify LM
Suit Circuit 3.6 To 4.3 Psia)

HATCH OPENING

Partially Open Fwd Hatch
Ovhd Or Fwd Dump Valve - AUTO

Fwd Hatch - Full Open

Jettison The Following:
Jett Bag
PLSS On Mid-Step
PLSS On Eng Cover

Verify Items Clear Of Ascent Stage

Fwd Hatch - Close & Lock

CABIN REPRESS

Dump Valves(Both)- AUTO (Verify)
CABIN REPRESS - AUTO (Verify)

CB(16)ECS: CABIN REPRESS - Close
MASTER ALARM & CABIN Warning Lt - On
Verify Cabin Press Increasing
PRESS REG A & B - CABIN

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psia

Doff Gloves, Stow On Comm Panel
Doff Helmets With Visors, Stow On ISS

Verify Safety On Dump Valve

LM O2 Hoses, R/B & B/R

DATE 5/10/71

DATE 6/30/71

LAUNCH PREP

********** LO-2:55 (168:42) (CDT 0916) **********

Unstow Lunar Surface Checklist 12-3
Stow EVA 3 Prep & Post Card
PRO (Hold In Until RESTART Lt-On; M.A. &
  LGC Warn-On/Off, NO DAP Lt-On, STBY Lt-Off)
RSET, V96E
CB(11) NUM LTG (AC) - Close
  IMU OPR - Close (NO ATT Lt-Off In 90 sec)
  MISSION TIMER - Close
  GASTA (AC/DC) - Close (2)
  CDR FDAI (AC/DC) - Close (2)
  UPDATA LINK - Close
V16 N65E
MISSION TIMER - Set

V25 N01E, 1365E
    E,E,E
V15 N01E, 1365E
  (All Zero)
V21 N27E, 10E

15 01 Test Successful When
    R2 ≥ 3 (78 sec)
V21 N27E, 0E

Notify MSFN of E-Dump
TLM-HI (Verify)
V74E (42 sec)

PWR AMPL - PRIM

POWER/TEMP MON - ED/OFF
Check ED VOLTS, A ___, B ___ (TO MSFN)
POWER/TEMP MON - BAT 4
BAT 4 - ON; tb - gray
POWER/TEMP MON - BAT 3
BAT L (CDR) - OFF/RESET; tb - bp
BAT 3 - ON; tb - gray
POWER/TEMP MON - Check BUS Volts

BIOMED - LEFT

Copy:
  P22 Acq Time
_____:_____:_____ (169:38:00)

  LO TIME (P57)
_____:_____:_____

UPDATA LINK - DATA (MSFN Uplinks
CSM S.V., Zeros POS/NEG Cells,
& RLS), OFF

Window Shades - Close
CB(11) AOT LAMP-Close
P57E, R2 00004, PRO
N34 (Load LO Time), PRO
N06 00010
00003
00010
PRO (NO ATT Lt - On/Off, Twice)
N04 Grav. Err. (.01°)
V32E (NO ATT Lt - On/Off, Twice)
N04 Grav. Lrr. (.01°)
PRO
N22 ICDU Angles (.01°)
PRO (NO ATT Lt - On/Off)
N71 Star, 4 Marks, 303 Navi

400 (74 Alioth)	
N88 X -.54285	
Y -.12733	
Z +.83012	

N05 Angle Diff. (.01°)
PRO
N93 Torq. Angles (.001°)
PRO
N25 00014, ENTR
P00E
CB(11) AOT LAMP - Oper
Window Shades - Open

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POST EVA CABIN CLEANUP

CB(11) HTRS; AOT Close

Secure CPS (2) On Floor
Stow Cuff Checklist In Purse
Stow EV Gloves & Visors (Remove Helmets)
  In LEVA Bags (Visors Aft)
Place LEVA Bags On Floor, 1Rt, 1 Left

Stow ISS In ISA Big Pkt
Empty ETB As Follows:
  Stow 3-B&W Mags MM,VV, WW In Fwd RHSSC
  Stow 2-B&W Mags SS, UU In Transfer
    Bag In LCG Compt
Stow 1-HCEX Mag TT In Transfer Bag
  In LCG Compt
  Stow 2-16mm Mags II,JJ In Transfer
    Bag In LCG Compt
  Stow Transfer Bags With II,JJ &
    SS,TT,UU & PP,QQ,RR In LM
    Mag Bag (LCG Compt)
  Stow LM Mag Bag In Bot Boot Compt, IV
    Gloves To Comm Panels
  Penetrometer Drum In Top Boot Compt
  EVA 3 Maps As Reqd
  Solar Wind In ISA Bot Pkt

Ancillary Container In Jett Bag
  Compt Aft OPS
ETB In ISA Big Pkt
Stow Cuff Checklist(Purse)ISA Big Pkt
Stow Purge Valves(Purse)In Aft LHSSC
Clip Page 3-2 (Purse) Over AOT
Stow Purse In ISA Bot Pkt

Stow Collection Bags, See 3-2
Report Bag Location To Hou

Unstow Scale (Bot RHSSC)
Weigh ISA (75#Max), Report To Hou
Stow Scale In RHSSC

Stow LM EVA Antenna
Install ISA In Aft Cabin, High

Attach BSLSS/Rock Bag (40#Max) To -Z27
Place Double Cue Card Between Bag &
  Blkhd If Reqd, Use Tape (LHSSC)

Secure LEVA Bags On Eng Cover
Secure Utility Lights On AOT
Stow All EVA Onboard Data
  In Flt Data File

169:30 CB(11) RR (2) - Close
(Acq-8:00) R/RDOT II/HDOT (AC/DC) - Close
CDR X-PNTR - Close
SIG STR DISP - Close

RR MODE - LGC (Wait 10 sec Before V371)
RATE/ERR MON (CDR) - RNDZ RCR

V95E
P22E
NOE R2 00001,
PRO (N54 R, Ṙ;If R>400 & Ṙ<0)
DSKY Blanks;V83E,N54,PRO By 130 nmi
V16 N72E (+19000, +33000)
NO TRACK Lt-Off at ~103nmi
(N78L, Rng, Rng Rt)
NO TRACK Lt On At ~80nmi
(N72 Goes To +18000, +27000)
POOE

V41 N72E (+00000, +28300)
N12 R2 00002, PRO
V16 N72E
CB(11) RR (2) - Open
V44E

Copy Ascent Pads
CSI Pad
LM DAP Wt

On Call From CMP:
VHF A XMTR - VOICE
(XMTR - OFF After
Conversation)

EAT PERIOD
169:37 TO 170.22

CREW STATUS REPORT

	CDR	LMP
MED		
PRD		

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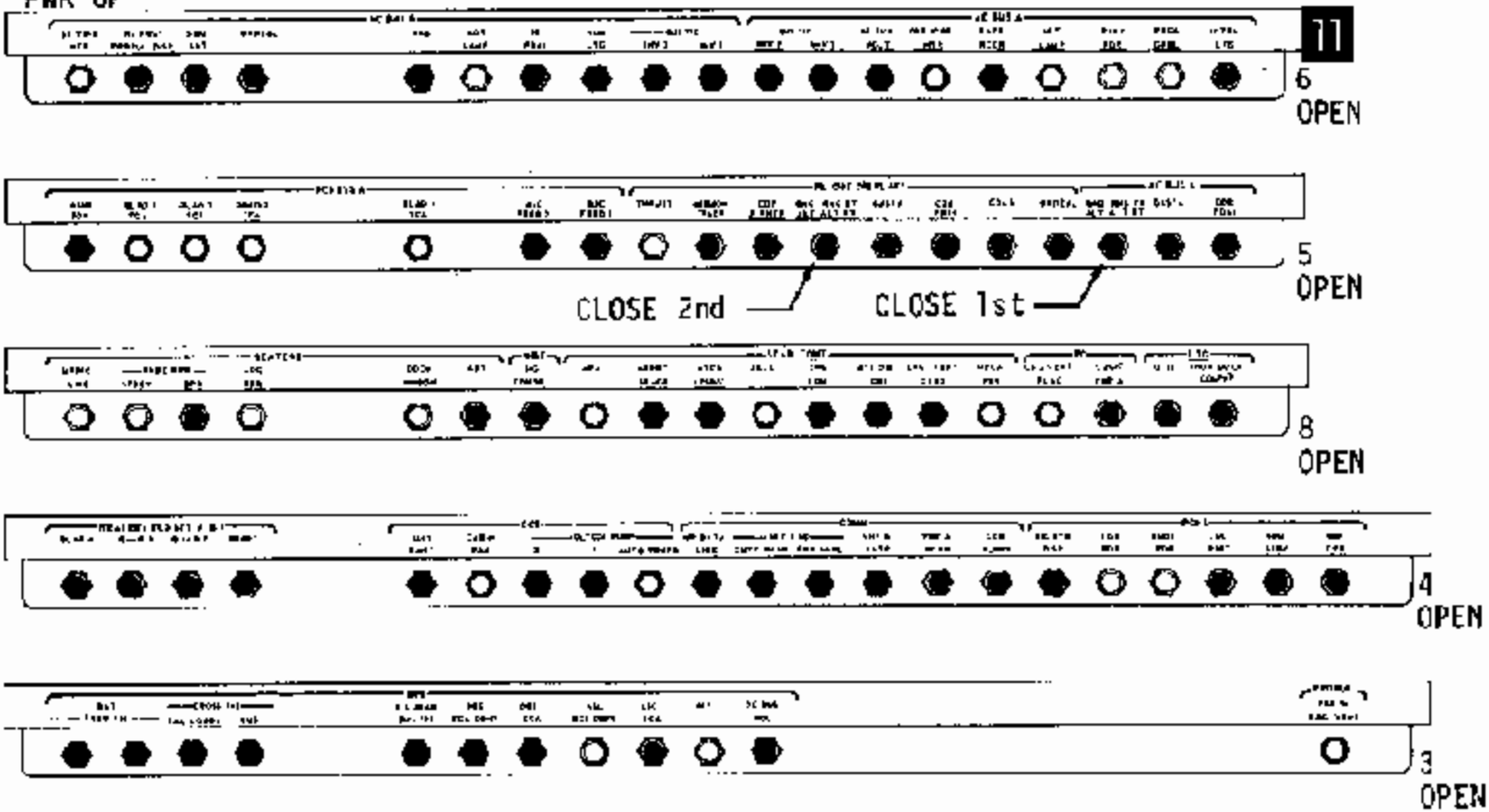
********** LO-1:15 (170:22) **********

Verify:
MASTER ARM - OFF
GUID CONT - PGNS
ENG ARM - OFF
ATTITUDE CONT (3) - MODE CONT
MODE CONT (Both) - ATT HOLD

Configure CB's Per PWR UP Charts

PWR UP



DATE 5/10/71

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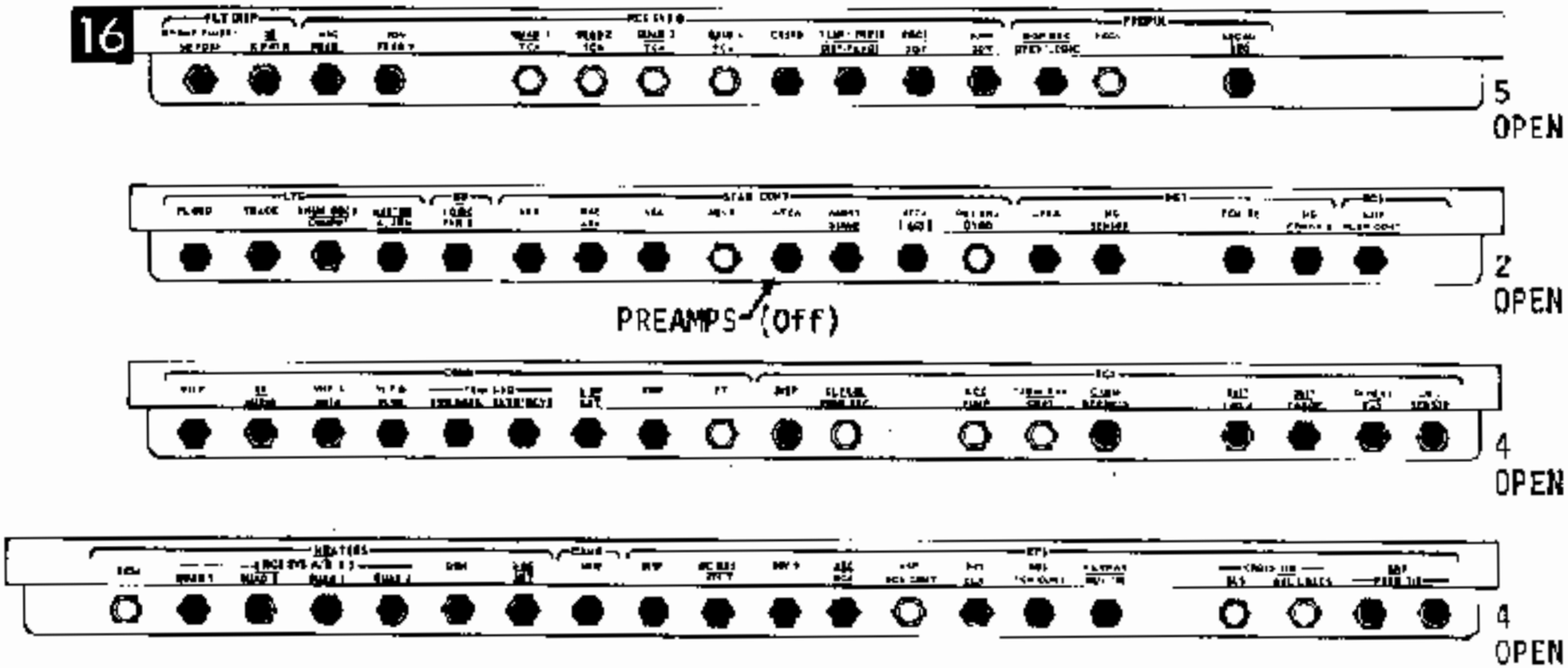
PWR UP



Omit Self Test If P22 Performed
CB(11) RR (2) - Close (NO TRACK Lt-On)
X-POINTER SCALE (2) - HI MULT
RATE/ERR MON (2) - RNDZ RDR
ATTITUDE MON (CDR) - PGNS, (LMP) - AGS
RNG/ALT MON - RNG/RNG RT
SHFT/TRUN - +50°
TEMP MONITOR - RNDZ (+10° To +75°)
RR MODE - AUTO TRACK
RADAR TEST - RNDZ (Rng Rt Tape
Drives, X-POINTERS Oscillate &
FDAI Needles Vary ±5°, After 12 sec
Rng Tape Drives NO TRACK & PWR FAIL Lts - Off)

TEST/MONITOR - AGC 1.4 To 1.9
- XMTR PWR 3.3 To 3.8
- SHAFT ERR 2.2 To 2.6
- TRUN ERR 2.2 To 2.6
- AGC

V25 N07E (Set NORRMON Flg)
101E, 10E, 1E

RR MODE - LGC (NO TRACK Lt - On)

CB(16) Cycle CWEA

AGS STATUS-OPERATE
(AGS Warn Lt-On)

000+888888 (OPR ERR Lt-On)

123 -45679
412R +1 Satisfactory

574R +Not Staged
604R -On Surface
612R +0 Attitude Hold At ABORT STAGE

400 + 4 Lunar Align (Wait 30 sec
Before 400 + 6)

544R _____ X Gyro Coeff (.01°/hr)
545R _____ Y Gyro Coeff
546R _____ Z Gyro Coeff

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V63E, R2 00001, PRO
(TRACKER & NO TRACK Lts - Off After 12 sec)
N72 Varying @ 1/2 cps
PRO
N78 +195.29 To +195.69 Rng (TM Within ±1.2 of R1)
-0480.0 To -0520.0 Rng Rt (TM = R2 -2)

V34E
(PWR FAIL & NO TRACK Lts - On, X-PNTRS Center)
RADAR TEST - OFF

V41N72E (+00000,+28300)
N12 R2 00002, PRO
V16N72E
CB(11) RR(2) - Open
V44E

400 + 6E Calibrate Gyros
(Calib. Complete in 5m 2s)

224 _____ Low Lim (+58566)
226 _____ Retgt Val For Term In ΔL(+5856
231 _____ RLS (+56907)
232 _____ INS ALT (+00600)
410 +0 ___ ORB INS
465 _____ INS HDOT (+00325)
547 +0 ___ LUNAR ALIGN CORRECTION
662R + 0 (4K10)
673R + 0

514 R _____ (-53334)
515 R _____ (-47371)
516 R _____ (+00000)

307 _____ ΔT TRANS (+04300)
373 _____ TIG TPL (101496)
451+0 ΔVY

400R (+0 Calib Complete)

544R _____ X (.01°/hr)
545R _____ Y
546R _____ Z

If Gyro Coeff Changes More Than 2.0°/hr, AGS Failed

********** LO-:55 (170:42) **********

GYRO TEST - POS RT (RPY RATE +5°/SEC)
GYRO TEST - NEG RT (RPY RATE -5°/SEC)

RATE SCALE -5°/SEC
Repeat Tests

V16 N65E LGC TIME
377 _____ (Bias 170)

P____, Y____ (+77/-66).
TRACK MODE - AUTO

S-BAND RANGE - CWEA ENABLE

********** LO-:50 (170:47) **********

V48, 12102, PRO, +10873 LM, PRO
V77E
V15N01E,42E(Rate Cmd Hot Fire Check
ACA to Jets)
CB(11 & 16) QUAD TCA (8)-Close
CDR ACA (Out-Of-Detent, Pause 2 sec At
Roll Rt R3 000XX Null)
Lt 777XX
Pitch Up R1 000XX
Dn 777XX
Yaw Rt R2 777XX
Lt 000XX
CB(11&16) QUAD TCA (8)-Open
V76E (Min Imp Check of CDR ACA To
LGC, ACA Cold Fire CES Voltage,
SLC RCS Cold Hot Fire 4-JET In
AGS)

Copy Updated AGS K Factor

_____:_____:_____

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V11 N10E, 31E, R1 67777
GUID CONT-AGS
ATTITUDE CONT (3)-MODE CONT
CDR ACA (Deflect Slowly To Hardover, Pause
2 sec At Null)

Roll	Rt	R1	27757	(QUAD Flag & RCS
	Lt		27737	TCA Warn Lt-On)
Pitch	Up		27776	
	Dn		27775	
Yaw	Rt		27767	
	Lt		27773	

Cycle C3(16) CWEA

GUID CONT - PGNS
MODE CONT (AGS) - AUTO

********** LO-:45 (170:52) **********

Window Shades - Close
CR(11) AOT LAMP - Close
P57E, R2 00001, PRO
N34 Load LO Time, PRO
N06 00010
00003
00110
PRO (NO ATT Lt - On/Off, Twice)
N04 Grav. Err. (.01°)
V32E (NO ATT Lt - On/Off, Twice)

N04 Grav. Err. (.01°)
PRO
N22 ICDU Angles (.01°)
PRO (NO ATT Lt - On/Off)
N71 Star, 4 Marks, 303 Navi

200 (46 Hamal)	
N88 X +.75378	
Y +.47837	
Z +.39604	

N05 Angle Diff. (.01°)
PRO
N93 Torq. Angles (.001°)
PRO
N25 00014, ENTR
P00E
CB(11) AOT LAMP - Open
Window Shades - Open

CB(11) RR(2) - Close
V41N72E (+17500,+27500)
N12 R2 00002, PRO
V16N72E
CB(11) RR (2) - Open
V44E
RR MODE - SLEW

V40N20E
400+3 AGS/PGNS Align
413+1
C47R _____ Transmit To MSFN
C53R _____ Transmit To MSFN

BAT 5,6 - ON, tb - gray
BAT 1,3 - OFF/RESET, tb-bp
CB(11&16) ASC ECA CONI(2)-Close

Set Camr For Ascent (LM3/SAC/10/CEX (F2.8,1/500,3C)
Mag (BB), ISA Top Pkt, 12fps, 6 min)
12-12

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********** LO-:35 (171:02) **********

V48E
N46 12102 PRO
N47 (+10873) LM Wt
PRO

GUID CONT - PGNS
MODE CONTROL (PGNS) - AUTO

P12E
N33 __:__:__ TIG (171:37:23.90)
PRO

N76 VH Final (+55408)
HDot Final (+00320)
Xrng (+00000)
PRO

N74 TFI, YAW, PITCH
DET - Set/DN
V77E

UPDATA LINK - DATA
(Possible MSFN Update Of
CSM S.V., RLS and LGC Gyro
Compensation)
UPDATA LINK - OFF

PRESSURE INTEGRITY CHECK

(Non EVA Crewman)

NOTE: LM Suit Circuit Shall Not Be Maintained At Elevated Press >5 min

SUIT GAS DIVERTER - PULL-EGRESS(Verify)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS REG B - DIRECT O2
Monitor Cuff Gage To 3.7 - 4.0 Psig
Then PRESS REG B - EGRESS (Cuff Gage Decay <.3 Psig In 1 min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt Press Decays To 4.8 Psia)

(EVA Crewman)

PLSS O2 - ON (Tone-On, O2 Flag-O)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Monitor Cuff Gage For 1 Min, Report Decay)
PLSS O2 - ON (Cuff Gage 3.7-4.0 Psig, Tone & O2 Flag May Come On)
Verify O2 Flag Clear

DATE 5/10/71

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PRPLNT TEMP/PRESS MON - ASC
HELIUM MON - ASC PRESS 1
SYS A&B ASC FUEL & OXID tb(4)-bp
SYS A&B QUAD 1,2,3,4, (8) tb-gray
CRSFD tb-bp
SYS A&B MAIN SOV tb(2)-gray
TEMP/PRESS MON - OXID MANF
ACA PROP (LMP) - ENABLE
GLYCOL - PUMP 1
SUIT FAN - 1
02/H20 QTY MON - ASC 1
RATE/ERR MON (LMP) - LDR RDR/CMPTR
ATTITUDE MON (LMP) - AGS
RADAR TEST - OFF
TEST MONITOR - AGC
SLEW RATE - LO
RR MODE - SLEW
DEAD BAND - MIN
ATTITUDE CONTROL (3) - MODE CONT
MODE CONTROL (2) - AUTO
TEMP MONITOR - RNDZ RDR
RCS SYS A/B-2 QUAD 1,2,3,4 - AUTO
X-POINTER SCALE (LMP) - LO MULT
ACA/4 JET (2) - ENABLE
TTCA/TRANSL (2) - ENABLE
TTCA (2) - JETS (Dn)
Eng STOP (2) - Reset

Reverse O2 Hoses R/R, B/B
Don Helmets, Gloves (Bot Boot Comp)
& Restraints

DES H2O - CLOSE
ASC H2O - OPEN
WATER TANK SEL - ASC
CABIN ALPRESS - CLOSE
DES O2 - CLOSE
ASC O2 No. 1 - OPEN

PRESS REG A&B - EGRESS
SUIT GAS DIVERTER - PULL/EGRESS
CABIN GAS RETURN - AUTO
SUIT CIRCUIT RELIEF - AUTO

DES FUEL & OXID VENTS (2) - OPEN
(tb(2)-gray)
DES He REG 1&2 - OPEN
(tb-gray)
CB(11) DES HE REG/VENT - OPEN
ASC He REG 1&2 - tb(2) -gray

********** LO-:17 (171:20) **********

V47E, 414 + 1

DATE 6/30/71

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VHF A: XMTR - VOICE/RNG (HOT MIKE TO CSM)
RCVR - OFF
VHF B: XMTR - OFF
RCVR - ON
AUDIO (Both) VHF A - T/R
VHF B - RCV
MODE - ICS/PTT
VHF ANT - AFT
RECORDER - ON

********** LO-:15 (171:22) **********

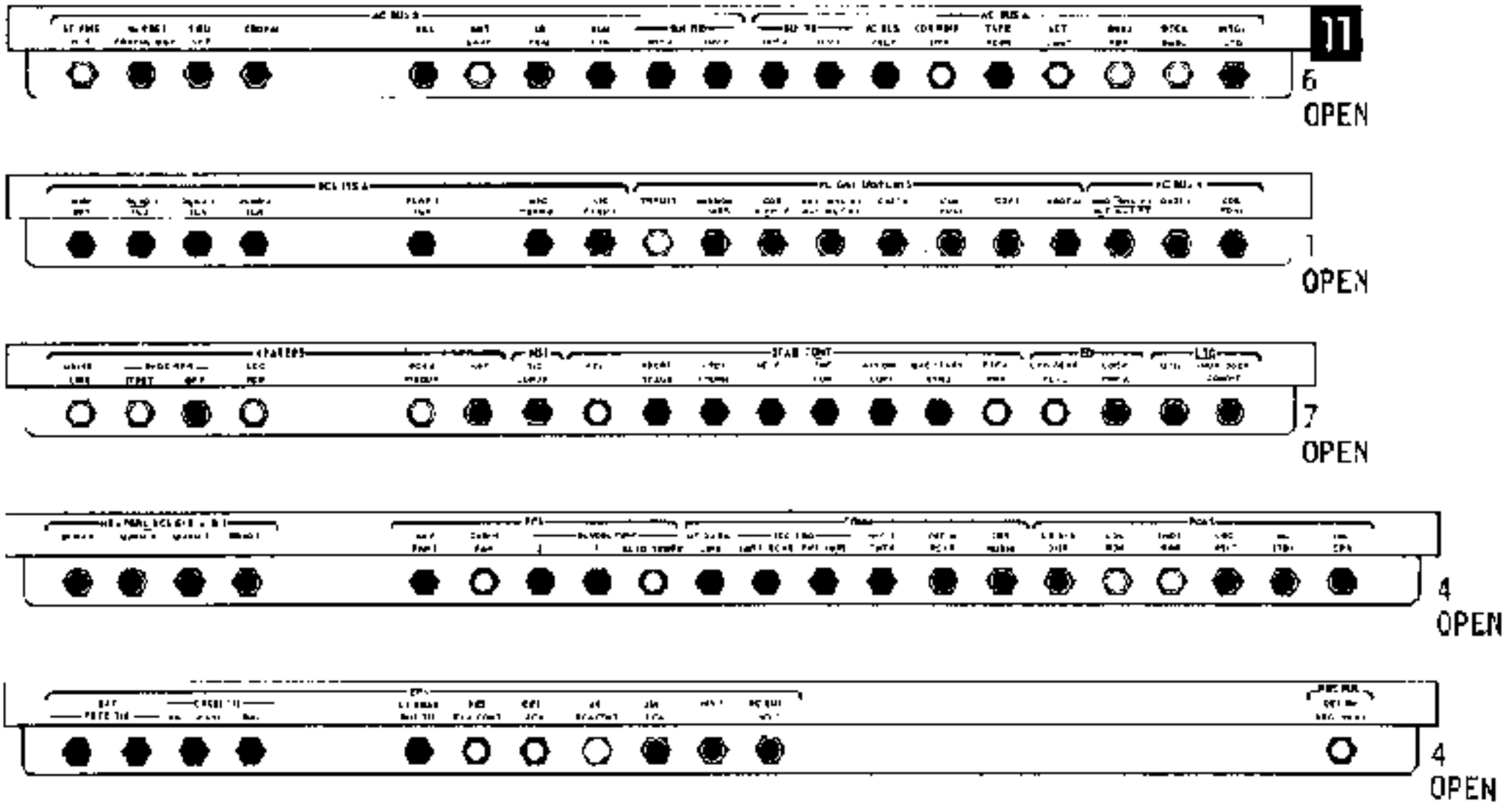
Guidance Recommendation From MSFN

BAT 2,4 - OFF/RESET, tb-bp
DES BATS - DEADFACE, tb-bp
If tb-bp,
CB(11 & 16) DES ECA - Open
CB(11 & 16) DES ECA CONT - Open

CB(11 & 16) ASC ECA CONT - Open

Verify CB's Per LAUNCH Configuration Charts

LAUNCH



12-TB

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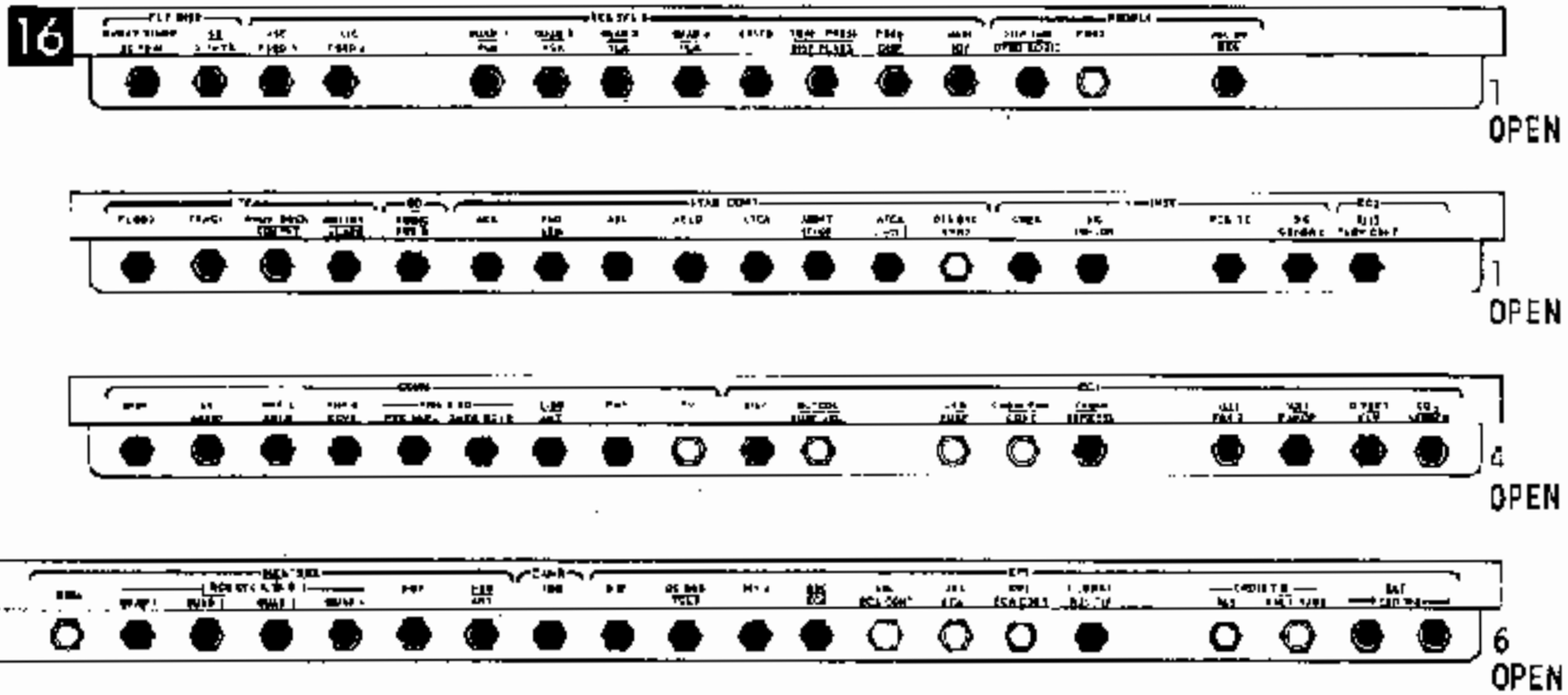
LAUNCH



********** LO-:12 (171:25) **********

V83L, 440R ($\Delta\dot{R} \leq 1.0$ fps)

********** LO-:10 (171:27) **********

EMER LO (APS LEAK)

400+1
GUID CONT - AGS

MASTER ARM - ON
ENG ARM - ASC
ABORT STAGE - Push

ENGINE START - Push
Go To ASCENT MONITOR T+1:00
(No YAW Mnvr)

MASTER ARM - ON
ASC He SEL - TANK 1
ASC He PRESS - FIRE
ASC He SEL - TANK 2
HELIUM MON - ASC PRESS 2
ASC He PRESS - FIRE
MASTER ARM - OFF

SYS A ASC FEED 2 - OPEN, tb(2)-gray (Unless
Monitor SYS A Manf Press CDR BUS
SYS A MAIN SOV - CLOSE, tb-hp Loss)

SYS B ASC FEED 2 - OPEN, tb(2)-gray (Unless
Monitor SYS B Manf Press LMP BUS
SYS B MAIN SOV - CLOSE, tb-bp Loss)

GO/NO GO For LO

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********** LO-:5 (171:32) **********

CB(11) RR (AC) - Close

Check APS START CARD
Check APS, RCS, EPS, ECS

GO To LM TIMELINE BOOK

DATE 6/30/71

ONE MAN EVA PREP

CABIN PREP-Perform EVA 1, 2 Or 3 As Reqd

EQPT PREP-Perform EVA 1, 2 Or 3 As Reqd

PLSS DONNING-Perform EVA 1, 2 or 3 As Reqd

Position Post EVA 1, 2 or 3 Cue Card
  For Post EVA

NON EVA CREWMAN-Connected To LM O2,
    Comm, & H2O
  Gas Connector Plugs In PGA
  PGA Diverter Vlv - Horizontal

EVA CREWMAN: PGA Diverter Vlv -
    Vertical
  CSRC In PGA Pkt

PLSS COMM CHECK

Verify Powerdown CB Configuration
  (White Dots Out)
Verify LM EVA Antenna Deployed
For TV Thru LM, COMM: MODULATE - FM
    Pwr Amp - Prim
Verify Voice Comm With Hou

Audio (Non EVA Crewman)
  S-BAND - T/R
  ICS - T/R
  RELAY - OFF
  MODE - VOX
  VOX SENS MAX
  VHF A - RCV
      B - T/R

Audio (EVA Crewman)
  S-BAND - T/R
  ICS - T/R
  RELAY - ON
  MODE - VOX
  VOX SENS MAX
  VHF A - RCV
      B - T/R

COMM:
  VHF A XMTR - OFF
      A RCVR - ON
      B XMTR - VOICE
      B RCVR - ON
  TLM BIOMED - NON EVA CREWMAN
  SQUELCH VHF A&B -
    Noise Thres + 1 1/2
  RECORDER - ON
VHF Antenna - EVA

AUDIO CB - Open
EVA Crewman Connect to PLSS Comm

AUDIO CB - Close
RCU PTT - MAIN (Rt), Verify

PLSS Mode-B, Blade-CCW
(Tone-On,Vent Flag-P,
Press Flag-O, O2 Mom)
PLSS O2 Press Gage >85%

Comm Check With Each Other & Hou

NOTE: Unstow PLSS Antenna If It
Transmits Garbled And/Or Loses TM.

Audio (CDR & LMP)
VHF A - T/R
VHF B - RCV

COMM:
VHF A XMTR - VOICE
VHF B XMTR - OFF

PLSS Mode - A, wheel-CCW (Tone-On)

Perform Comm Check With Each Other &
Comm & TM Check With Hou
Read PLSS O2 Qty To Hou

NOTE: If Comm Is NO GO With Hou
S-BD MOD - PM
Verify Comm & TM

FINAL SYSTEMS PREP

CB(16) ECS: LCG PUMP - Close
LCG - Cold, As Reqd
CB(16) ECS: CABIN REPRESS - Close (Ver)
SUIT FLOW CONT- Open

SUIT GAS DIVERTER - PULL-EGRESS(Verify)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - AUTO (Verify)

DATE 6/30/71

OPS CONNECT

SUIT ISOL - SUIT DISC
Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B
Retrieve Purge Valve (Purse) -
  Verify Closed, Lock Pin In & LO
Install Purge Valve In PGA R/R

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets, Check Drink Bag Position
Don LEVA

EVA Crewman:
  LCG - COLD, As Reqd
  Disconnect LM H2O Hose
  Connect PLSS H2O Hose
  Stow LM Hoses

Verify EVA Crewman in CDR's Station

Verify The Following (Both):
  Helmet & Visor (2) - Aligned & Adjusted
  O2 Connectors (7) - Locked
  Purge Valve (1) - Locked
  H2O Connectors (2) - Locked
  Comm Connectors(2) - Locked

Don EV Gloves & Verify:
  Wrist Locks (4) - Locked
  Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON (Rt)

PRESSURE INTEGRITY CHECK

(Non EVA Crewman)

NOTE: LM Suit Circuit Shall Not Be Maintained At Elevated Press >5 min

SUIT GAS DIVERTER - PULL-EGRESS(Verify)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS REG B - DIRECT O2
Monitor Cuff Gage To 3.7 - 4.0 Psig
Then PRESS REG B - EGRESS (Cuff Gage Decay <.3 Psig In 1 min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt Press Decays To 4.8 Psia)

(EVA Crewman)

PLSS O2 - ON (Tone-On, O2 Flag-O)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Monitor Cuff Gage For 1 Min, Report Decay)
PLSS O2 - ON (Cuff Gage 3.7-4.0 Psig, Tone & O2 Flag May Come On)
Verify O2 Flag Clear

DATE 5/10/71

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CABIN DEPRESS

Confirm Go For Depress From Hou
CB(16)ECS: CABIN REPRESS - Open
For TV Thru LM, CB(16) Comm: TV - Close
CABIN REPRESS VLV - Close

Ovhd Or Fwd Dump Valve - OPEN Then AUTO
At 3.5 Psia (Verify EVA Crewman Cuff
Gage Does Not Drop Below 4.6 Psig)
Verify:
Cabin At 3.5 Psia
LM Suit Circuit Lockup At 4.3 Psia &
Decaying
PLSS/OPS/PGA > 4.6 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN
Verify:
Tone-On & H20 Flag - A (1.2-1.7 Psia)
LM Suit Circuit 3.6 To 4.3 Psia &
Decaying
PLSS/OPS/PGA > 4.6 Psig & Decaying

Partially Open Fwd hatch

FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H20 Flag -
Clear In About 4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient
Verify:
PLSS/OPS/PGA 3.7 To 4.6 Psig
CWEA Status:
Caution
PREAMPS

Lower EV Visor
Release PLSS Antenna :10

POST ONE-MAN EVA

Perform POST EVA 1,2 or 3 As Applicable

DATE 7/13/71

DETAILED PROCEDURES - MINIMUM TIME EVA - ONE MAN

The following pages are step-by-step timeline procedures for a minimum time one-man-EVA. These procedures are on the same vertical timeline format as a normal EVA. Since the EVA crewman will not have a cuff checklist for this contingency, the IVA crewman will read the procedure to the EVA crewman and supply supporting information as required.

ONE-MAN EVA 1
(MIN TIME)

IVA ACTIVITIES	EVA TIME	EVA ACTIVITIES
	0+00	Check cabin pressure "ZERO" - Feedwater - ON Open Hatch
		NOTE: Detailed procedures are presented in "Lunar Surface Checklist", "Equipment Prep EVA 1" section.
	0+[illegible]	Move thru hatch

DATE 7/13/71

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	0+10	Move thru hatch
Prepare LEC		
Pass LEC to EVA Crewman		Deploy LEC
		Descend to top of ladder Deploy MESA
Photo EVA Crewman descend with 70mm camera		Descend to footpad
LM 16mm Seq Cam - ON (12 FPS)		Check ascert capability to lower ladder rung
NOTE: Monitor & photograph EVA crewman using 70mm camera and LM 16mm Seq Cam.		Step to surface
Read procedures to EVA crewman		Check and discuss mobility and stability
	0+20	Report LM status

	0+20 Report LM status
Transfer ETB to surface	Transfer ETB Hang on MESA
16mm Cam - OFF Change Mag 16mm Cam - ON	Unstow CSRC & deploy handle and bag Collect sample Remove handle & close bag Hang sample on ladder
	Rest/Check EMU
	Unstow 70mm Camera from MESA
	Remove mag LL from ETB and install on camera
	Attach camera to EMU
	Check surface locomotion capability
	0+30

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16mm cam - OFF Change mag 16mm Cam - ON (12 FPS)	0+30 Describe landing site and LM landing condition
	Obtain +Z panorama
16mm Cam - OFF	0+40 Stow 70mm Cam and Contingency sample in ETB

14-5

	0+40 Stow 70mm Cam and Contingency sample in ETB
Transfer ETB into cabin	Transfer ETB into cabin
Remove 70 mm cam and contingency sample from ETB	Clean EMU
	Climb ladder to porch
Pass LEC/ETB to CDR	Receive & discard LEC/ETB
	Ingress - Go to Post EVA Procedures
	0+50

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EVA-1 Two Man Walking Traverse

The following pages present detailed step-by-step procedures, in a vertical timeline format, for the EVA-1 Two Man Walking Traverse. These procedures are based upon the assumption that LRV failure occurs at the point of test driving the vehicle (0+45 into EVA-1) and that the geology traverse will be accomplished during EVA-1 and the ALSEP will be deployed in EVA-2. The geology station activities will be similar to those in the nominal EVA-1 traverse. The exceptions, notably, are those in which the necessary equipment is not available due to absence of the LRV and that the between station traverse times will be increased to reflect the walking traverse rate.

EVA-1 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

LMP ACTIVITIES	EVA TIME	CDR ACTIVITIES
	0+30	

NOTE: For the purpose of this timeline plan, it is assumed that the EVA activities are nominal up to 45 minutes into the EVA at which time a LRV malfunction occurs.

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0+40

Remove 16mm mag CC from ETB and attach to camera

Photo CDR/LRV

Stow 16mm cam on LRV LMP handhold
Troubleshoot LRV (30 min Max)

Test drive LRV - Park LRV in Quad IV near MESA

[LRV will not function]
Troubleshoot LRV (30 min Max)

0+50

1+10

Abandon LRV

Unstow and attach EVA-1 pallet to MESA table

Remove & discard 16mm cam rack
Unstow & place ECS LiOH in pallet pocket

Stow ETB on MESA table
Attach LEC to EVA-1 pallet

Climb LM ladder to porch

Abandon LRV

Remove Quad III thermal blankets from geology pallet

Offload geology pallet from LM and place on +Y footpad

Remove & discard pallet handrails
Pull HTC stowage pip pin
Remove straps around HTC legs

Open HTC and swing out
Pull hinge pin lanyard to release HTC

1+20

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Retrieve cont sample & ingress LM

Stow cont sample inside LM

Attach LEC to overhead handrail

Transfer pallet into LM

Disconnect LEC from pallet

Stow LEC inside cabin

Remove from pallet & stow: food, batteries, LiOH cans

Place pallet on LM floor

Move through LM hatch

Retrieve & discard pallet

Close LM hatch

Descend to surface

1+20

Deploy HTC legs and place HTC on surface near +Y footpad

Pull HTC stowage pip pins (4)

Remove stowage bracket

Stow tongs on HTC

Transfer pallet into LM

Unstow SCB #2 & #3 from geology pallet & place on HTC

Remove 70mm mags KK, OO from ETB & stow in SCB #3

Unstow CDR's 70mm cam from MESA & attach mag NN from ETB & leave cam in ETB

Unstow and open SCB #1

Remove & stow in SRC: 6 core stems, 2 core stem cap disp, 2-20 DSBD, 1 core tube cap disp

1+30

Descend to surface	1+30	
Attach to CDR's PLSS: • SCB #1 to left side • SCB #2 to right side		Attach to LMP's PLSS: • Hammer (from HTC) • Core tube tool (from HTC) • SCB #2 to left side • SCB #4 (from pallet) to right side • Core tube cap dispenser
Assemble & tether ext hndl/scoop		
Close lid on SRC #1		Tether tongs
Open LRV antenna cap		Unstow the LCRU from MESA
Unstow LGA		Attach LCRU to back of LMP's PLSS
Hand LGA to CDR		Install LGA on LCRU & connect antenna cable
Assist CDR with LCRU checkout		LCRU cb-closed LCRU Pwr Sw - INT LCRU Sel Sw - PM1/NB Check LCRU AGC, Temp & Power LCRU Sel Sw - PM1/WB
	1+40	

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1+40

Remove BSLSS from ETB & attach to CDR's PLSS

Attach 70mm cam/bag disp to EMU

Retrieve traverse maps and sun compass from ETB

Depart on Geology Traverse

Tidy MESA thermal blankets

Attach 70mm cam/bag disp to EMU

Unstow gnomon, deploy and carry on geology traverse

Orient TV in dir of traverse

Depart on Geology Traverse

NOTE: The geology traverse & task information for the EVA-1 Walking Traverse is contained in Section 4.3, Table 4.3-I of the Lunar Surface Procedures Document, Final Edition (7/9/71).

1+50

Arrive at LM	6+00 Arrive at LM Orient TV to view LM area
Remove SCB #1 & #2 from CDR PLSS & stow on HTC	Remove SCB #3 & #4 from LMP PLSS & place on LRV seat
Remove BSLSS from CDR PLSS & stow in sun	Remove LCRU from LMP PLSS & stow in sun
Stow samples from SCB #2 in SCB #1	Remove hammer, core tube tool & core tube cap disp from LMP PLSS & stow on HTC
Remove 6 core stems & 2 core stem cap disp from SRC #1 & stow in SCB #2 (on HTC)	
Unstow SWC from MESA	Retrieve from MESA & install filter on 70mm cam
Carry SWC 60 ft SE of LM	Retrieve gnomon
	Select site for polarimetric photography
Remove SWC from stowage can	
Extend SWC staff	
Deploy SWC foil	6+10 Obtain far-field polarimetric photographs

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Deploy SWC foil

Push SWC staff into surface

Photo SWC X-sun & dn-sun

Return to LM

Obtain 70mm photo pans around LM at 12:00, 4:00 and 8:00/30 ft; photo descent engine/surface (Quads II & III) and inspect LM

6+10 Obtain far-field polarimetric photographs
- 3 photos, 50-110 degree phase angle
- 3 photos 20 degrees down-sun from first photos

Place gnomon at sample site

Obtain near-field polarimetric photographs
- 1 photo down-sun
- 3 photos, 90 degrees phase
- 3 photos, 110 degrees phase
- 3 photos, 130 degrees phase

Collect a min. of 4 rock samples in doc. sample bag

Obtain post-sampling photos, X-sun & dn-sun

6+20

6+20

Retrieve gnomon & walk to LM

Stow samples in SCB #4

Unstow flag kit from MESA

Stow tongs on HTC

Remove flag covering

Stow gnomon on HTC

Keep staff & pass flag to CDR

Select flag deployment site

Retrieve hammer from HTC

Drive staff into surface

Deploy & mount flag in staff

Photo CDR/Flag

Pass 1MP 70mm cam to CDR

Photo LMP/Flag

Stow hammer on HTC

Remove SCB #1 from HTC & place in SRC #1

Stow 70mm camera in ETB

Remove SRC #1 seal protector

Transfer all cam mags from SCB #3 to ETB

Close and seal SRC #1

6+30

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Close and seal SRC #1	6+30	Transfer all cam mags from SCB #3 to ETB
Place SCB #4 on SRC #1		Remove mag from 500mm lens cam & stow in ETB
		Stow 500mm lens cam on MESA
Place SCB #3 on SCB #4		
Tidy MESA thermal blankets		Unstow dust brush from Quad III pallet
Unstow dust brush from geo pallet		
Clean CDR's EMU		Clean LMP's EMU
Stow dust brush on geo pallet		Stow LMP's PLSS antenna
Ingress LM carrying SCB #3		
Attach LEC to handhold		Attach LEC to SRC #1
Transfer SRC #1 into LM	6+40	Transfer SRC #1 into LM

6+40

Remove SRC #1 from LEC

Stow SRC #1 in LM

Transfer ETB into LM

Remove ETB from LEC
Stow ETB in LM

Transfer LEC hooks to surface

Attach LEC to ETB

Transfer ETB into LM

Transfer LEC hooks to
surface

Stow LEC on ladder hook

LCRU Pwr Sw - OFF
Adjust LCRU thermal blankets

Clean EMU

6+50

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	6+50 Clean PMU Ascend ladder carry SCB #4
Stow SCB #4 in LM	Hand SCB #4 to LMP
Pass LEC to CDR	Stow LEC on platform
Assist CDR - Stow CDR's PLSS antenna	Ingress

NOTE: DETAILED PROCEDURES FOR FINAL EVA CLOSEOUT ARE PRESENTED IN SECTION 5 OF THIS DOCUMENT.

END 1st EVA

7+00 END 1st EVA

EVA-2 TWO MAN WALKING TRAVERSE

The following pages present detailed step-by-step procedures, in a vertical timeline format, for the EVA-2 Two Man Walking Traverse with the assumption that the LRV has not been usable on EVA-1. In this case, the ALSEP is deployed on EVA-2 followed by the geology traverse. These procedures are also included in the Lunar Surface Checklist. The geology station activities will be similar to those in the nominal EVA-2 traverse. The exceptions, notably, are those in which the necessary equipment is not available due to absence of the LRV. The between station traverse times are increased to reflect the walking rate.

EVA-2 TWO MAN
WALKING TRAVERSE

Assist CDR; deploy CDR PLSS antenna	0+10 Move thru hatch
Place jett bag in hatch	Toss jett bag in Quad I Hand LEC to LMP
Attach LEC to handhold	
Ready ETB for transfer	Descend to surface
Confirm "GO" for 2-Man EVA	Unstow MESA Pallet #2 and attach to MESA table
	Unstow ECS LiOH canister & place in pallet bag Attach LEC to pallet
Transfer pallet into LM	Transfer pallet into LM
	Describe additional LM site characteristics
Disconnect LEC from pallet	
Attach LEC to ETB	
Transfer ETB to surface	Transfer ETB to surface
	0+20

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	0+20	
Disconnect and stow LEC Remove & stow pallet equipment		Attach ETB to SRC table Stow LEC on ladder hook
Place pallet on LM floor Recorder - OFF Verify VOX Sens (2) - Max Verify CB configuration Utility & Floodlights - OFF Move thru hatch		Unstow drill from MESA & place on surface
Discard pallet into Quad I		Get 70mm cam from ETB & photo LMP egress
Close hatch		
Descend to surface		
CDR deploys LMP PLSS antenna		Deploy LMP PLSS antenna Position TV to view ALSEP offload
Open SEQ bay doors		
	0+30	Offload ALSEP pkg 1 (expts pkg)

	0+30 Offload ALSEP pkg 1 (expt pkg)
Offload ALSEP pkg 2 (pwr pkg)	
	Remove and discard boom-to-pkg-stick
Remove & discard boom-to-pkg stick	Move pkg clear of SEQ bay
Position pwr pkg for fueling	
Pull tool stowage pip pins (4)	
Unstow UHT'S, pass one to CDR tether 2nd JHT	Tether UHT
Unstow & pass carry bar to CDR	Assemble & attach carry bar to expts pkg
Deploy fuel cask lanyard	
Rotate fuel cask down & stow lanyard	
Unstow & engage dome removal tool	Assist LMP with RTG fueling as required
Check tool securely engaged	
Remove & discard dome/tool	
Unstow fuel transfer tool	
Tip power pkg down	
Engage fuel transfer tool	
Check tool securely engaged	
Remove fuel element from cask	Check offload booms retracted
Insert fuel element into RTG	Close SEQ bay doors
Report RTG fuelec	
Removed & discard tool	0+40 Position TV to view ALSEP trav

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0+40

Tip pwr pkg up
Attach pwr pkg to carry bar

Carry ALSEP pkgs to deployment site

Get traverse map from ETB & stow on HTC
Tidy MESA blankets
Carry ALSD and HTC to ALSEP site

0+50

	0+50	
		Survey ALSEP site
Place pkgs on surface with expts pkg in final position		Place ALSD & HTC on surface Orient ALSD to face sun
Disconnect pwr pkg from bar		
Reposition pwr pkg 10' East		
Remove HFE stowage pip pins (2)		
Tip pwr pkg down Release RTG cable B. bolts (3) Deploy RTG cable & discard cable reel		Release HFE pallet B. bolts (2) Lift HFE pallet from pwr pkg Carry HFE pallet 15'N C/S
Report shorting switch amps		Unstow HFE connector
Connect RTG cable to C/S		Place HFE pallet on surface Connect HFE cable to C/S
Release subpallet B. bolts (2)		
Lift subpallet from PWR PKG & place 10' N. of PWR PKG		Carry HFE pallet 30' N of C/S, deploying cable
Release SIDE B. Bolts (4) & CCIG cover bolt Lift SIDE from subpallet		
Remove B. Bolt blocking cable reel	1+00	Place HFE pallet on surface & fold mounting braces Tip pallet down

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Remove B. Bolt blocking cable reel
Unstow cable reel
Deploy SIDE legs & place SIDE on surface
Unstow SIDE cable connector
Open EXPTS PKG dust cover
Connect SIDE cable to C/S
Remove carry bar from C/S
Tip C/S down & align
Stow carry bar on subpallet
Unstow PSE stool from subpallet
Scoop out depression for stool
Implace PSE stool 9' West of C/S
C/S dust cover remove
Release PSE B. Bolts (4)
Carry PSE to stool
Remove B. Bolts from PSE
Place PSE on stool

1+00 Tip pallet down
Release probe box B. Bolts (4)
Lift probe box from pallet
Separate box and lean probe with tool against pallet
Carry other probe to drill site, deploying cable
Place probe on surface
Carry 1st probe to drill site, deploying cable
Place probe on surface
Release electronics box B. Bolts (4)
Lift electronics box from pallet
Remove dust cover
Kick pallet clear of area
Place box on surface, level and align

1+10 Deploy ALSD brackets on HTC

Place PSE on stool

Report PSE level & alignment

Release SWE B. Bolts (4)

Lift SWE from C/S

Carry SWE 13' N. C/S, deploying cable

Check legs extended & locked
Place SWE on surface, level and align

Release LSM B. Bolts (2)

Remove tie down & discard

Lift LSM from C/S

Check cable free of sun shield

Carry LSM 50' WNW, deploying cable

1+10 Deploy ALSD brackets on HTC

Retrieve drill from surface
Place drill on HTC

Push drill SW to test drill
Deploy rack legs and remove rack from treadle

Place rack on surface
Remove drill from treadle

Carry drill & rack to 1st drill site

Place rack & drill on surface

Remove & discard stem cover
Release stem retaining velcro

Assemble first two bore stem sections (one with bit)

Insert sections into drill chuck

Set drill bit down on surface at mark on HTC cable

1+20

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Carry LSM 50' WNW, deploying cable

Select LSM site

Remove stowage bracket
Deploy legs

Align LSM & place on surface with cable outside legs

Remove from collar

Deploy center sensor arm then other two sensor arms

Remove dust covers & PRA cover

Align and level LSM

Check doors open & LSM free of discarded parts

1+20

Remove battery thermal shroud
Drill bore stem into surface

Remove drill from bore stem

Reset drill chuck
Place drill on surface
Assemble 3rd & 4th sections of bore stem

Lift & attach drill to bore stem
Drill bore stem into surface

Remove drill from bore stem

Reset drill chuck
Place drill on surface

Assemble 5th & 6th sections on bore stem

Lift & attach drill to bore stem
Drill bore stem into surface

1+30

Check doors open & LSM free of discarded parts	1+30	
Report level & alignment Return to C/S Starting front center & proceeding CW, release/deploy in turn B. Bolts, side cable, antenna cable and back sunscreen		Remove drill from bore stem Reset drill chuck Place drill on surface Retrieve probe from probe box
Release two inter B. Bolts Release center B. Bolt and raise sunshield		Insert probe into bore stem Retrieve probe rod from box
Remove sunscreen covers and discard (3)		Push probe to bottom of stem Report probe depth
Check sunscreens properly deployed & engage velcro tabs		Carry rack, rod and drill to 2nd drill site
Retrieve & install antenna mast		Place equipment on surface Assemble 1st two bore stem sections
Release antenna gimbal B-Bolts		Insert sections into drill chuck Set drill bit down on surface at mark on HFE cable
Remove gimbal from subpallet Remove gimbal housing cover		Drill bore stem into surface
Install gimbal on mast Remove housing & discard		Remove drill from bore stem
Install antenna on gimbal	1+40	Reset drill chuck Place drill on surface

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Install antenna on gimbal

Check C♥S alignment

Level & Align antenna base

Enter elev 4.71 and azimuth 35.81 offsets

Recheck antenna level and alignment

Retrieve SIDE near subpallet

Carry SIDE 55 ft NE, deploying cable

Select SIDE deploy site

Remove SIDE dust cover

Remove & implace ground screen

Remove CCIG cover

Remove CCIG from cavity

1+40 Reset drill chuck

Place drill on surface

Assemble 3rd & 4th sections on bore stem

Lift & attach drill to bore stem

Drill bore stem into surface

Remove drill from bore stem

Place drill on surface

Assemble 5th & 6th sections on core stem

Lift and attach drill to bore stem

Drill stem into surface

Remove drill from bore stem

Remove & discard drill chuck

Place drill on surface

Retrieve probe from probe box

Insert probe into bore stem

1+50 Retrieve probe rod

Remove CCIG from cavity

Mount CCIG in ground screen tube

Pull ground screen tube pin

Place SIDE on ground screen

Level & align SIDE

Rotate CCIG down onto surface

Pull SIDE dust cover pin
Report pin pulled
Recheck SIDE level & aligned
Return to C/S

Depress shorting switch
Check shorting switch amps zero
Turn Astro Sw #1 clockwise
Request X-mitter turn on
Return to LM

1+50 Retrieve probe rod

Push probe to bottom of bore stem

Report probe depth
Withdraw & discard probe rod

Carry rack & drill to coring site (position HTC as required)

Implace drill treadle on surface

Open SCB #2 and assemble 1st two core stems

Thread sections into drill
Lift drill and place core bit into treadle
Drill core stem into surface

Remove drill from core stem & place on surface
Assemble 3rd & 4th core stem sections

Thread sections onto stem
2+00 Retrieve drill and attach drill to core stem

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Remove thermal blanket from over LRRR in Quad III

Offload LRRR pallet from LM

Place pallet on surface & remove LRRR from pallet

Get LMP 70mm cam from ETB & mount on EMU (carry CDR's 70mm cam to ALSEP site-leave on HTC)

Retrieve and carry LRRR >25ft west of central station

2+00 Retrieve drill and attach drill to core stem

Drill core stem into surface

Remove drill from core stem & place on surface

Assemble 5th & 6th core stem sections

Thread sections onto core stem

Retrieve drill and attach drill to core stem

Drill core stem into surface

Retrieve CDR 70mm camera from HTC

Obtain photo pans 7 ft X-sun from drill and 3 ft either side of 7 ft pt.

Place 70mm cam on HTC

Pull drill/ stem from surface to expose 1st joint

Remove drill from stem

2+10

	2+10 Remove drill from stem
	Remove stem caps from SCB #2
	Cap core stem top section
	Retrieve stem wrench
Place LRRR on surface	
Pull alignment device pip pin	Pull stem from treadle, breaking each joint as it comes thru treadle
Pull reflector array pip pin	
Deploy reflector array	Place stem on HTC
	Cap stem bit end
Pull leveling leg pip pin	Disjoint, cap, and stow stem sections in SCB #2
Deploy leveling leg	
Tip LRRR down	
Level and align LRRR	
	Discard UHT
Remove dust covers	Strip off outer protective gloves and discard
Recheck level and alignment	
Photo LRRR & ALSEP	Collect documented samples from ALSEP area until LMP completes ALSEP photos
NOTE: Deploy LSM sun shield after LSM photography complete	
	2+20

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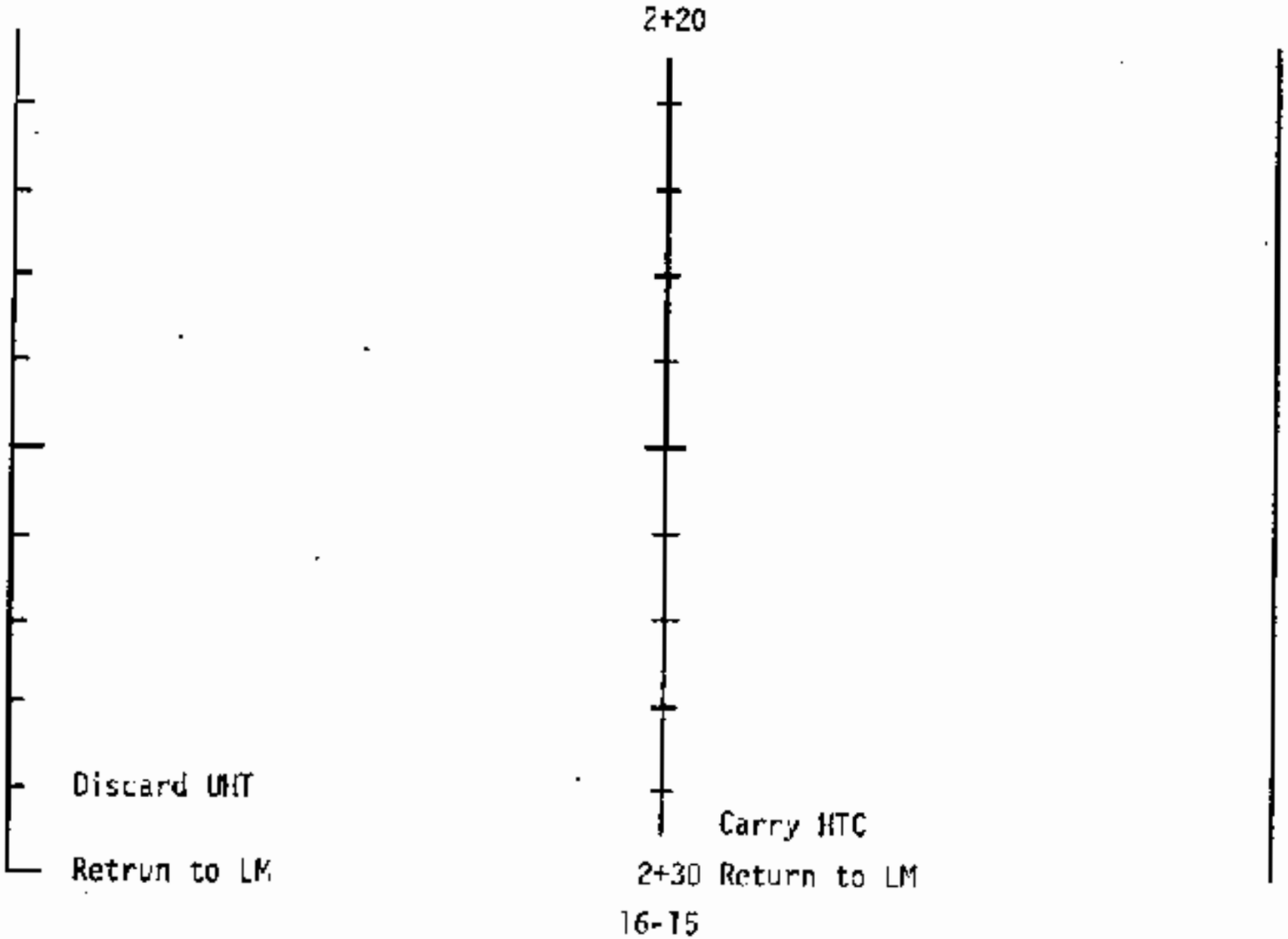

Return to LM

Open MESA thermal blankets

Unstow both LCRU batts from MESA

Hand one batt to CDR - wrap other batt in Quad III therm blanket & stow in +Y footpad

Unstow SCB #7 from geo pallet & open

Transfer from SCB #5 on HTC to #7:
- 3-core tubes
- Core tube cap disp - in pkt
- SESC - in pocket
- 2-20 bag dispensers

2+30 Return to LM

Unstow & open SRC #2

Remove SCB #5, stow on HTC

Replace LCRU battery

Switch LCRU - INT pwr

Transfer core stems in SCB #2 (on HTC) to SRC #2

2+40 Attach to LMP PLSS tool harness:
- SCB #2 & #6

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	2+40 Attach to LMP PLSS tool harness: • SCB #2 & #5 • Core tube cap dispenser • Hammer • Core tube tool • LCRU
Place SCB #7 in +Y footpad Place one 20 bag dispenser on each 70mm camera	
Replace mag KK on LMP camera with mag PP	LCRU Sel Sw - PM1/WB
Attach to CDR PLSS tool harness: SCB #5 BSLSS	Stow spare 70mm Mags QQ & RR in SCB #6
Tether scoop/ext handle	Tether tongs
Attach 70mm cam to EMU	Attach 70mm cam to EMU
	Get traverse maps from ETB
Tidy MESA blankets	Orient TV to traverse direction
Depart on geology traverse	Depart on geology traverse

NOTE: The geology traverse & task information for the EVA-2 Walking Traverse is contained in Section 4.3, Table 4.3-2 of the Lunar Surface Procedures Document, Final Edition (7/9/71).

2+50

Arrive back at LM

Stow 70mm cam in ETB

Remove BSLSS & SCB #5 from CDR PLSS

Place BSLSS in sun and SCB #5 on MESA table

Stow scoop/ext handle on HTC
Assist CDR

6+20

Arrive back at LM

Orient TV to view LM

Stow 70mm cam in ETB

Remove LCRU from LMP PLSS & place in sun

Assist LMP

Remove from LMP PLSS tool harness
- Core tube cap disp. - discard
- Hammer - stow on HTC
- SCB #2 & #6 - stow on HTC
- Core tube tool - stow on HTC

6+30 Tidy harness velcro covers

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	6+30	Tidy harness velcro covers
		Remove BSLSS from LMP PLSS & stow in sun (in thermal blanket)
Remove SCB #6 from HTC & carry to MESA		Remove core stems from SRC #1 and stow in SCB #5
Remove 70mm mags from SCB #6 & stow in ETB		Fill SCB #5 with doc samples from SCB #6 (as required) and place in SRC #1
Leave SCB #6 on MESA		
Remove SCB #2 from HTC and place on MESA		Remove SRC seal protector Close & seal SRC #2
Unstow dust brush from geo pallet Clean CDR's EMU		
		Clean LMP's EMU & stow LMP PLSS antenna
Ingress; carry SCB #6 into LM		Stow dust brush on geo pallet
		Tidy MESA thermal blankets
		Stow maps in ETB
Attach LEC to handhold	6+40	Attach LEC to SRC #2

Attach LEC to handhold

Transfer SRC #2 into LM

Remove SRC #2 from LEC
Stow SRC #2 in LM

Transfer ETB into LM

Remove ETB from LEC

Stow ETB in LM

6+40 Attach LEC to SRC #2

Transfer SRC #2 into LM

Transfer LEC hooks to surface
Attach LEC to EIB

Transfer ETB into LM

Transfer LEC hooks to surface
Stow LEC on ladder hook

Adjust LCRU thermal blankets

6+50 Clean EMU

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	6+50 Clean ENU
	Ascend ladder; carry SCB #2
Stow SCB #2 in LM Pass LEC to CDR	Hand SCB #2 to LMP Stow LEC on platform
Assist CDR; stow CDR's PLSS antenna	Ingress

NOTE: DETAILED PROCEDURES FOR FINAL EVA CLOSEOUT ARE PRESENTED IN SECTION 8 OF THIS DOCUMENT.

End 2nd EVA	7+00 End 2nd EVA

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	6+50 Clean EMU
	Ascend ladder; carry SCB #2
Stow SCB #2 in LM Pass LEC to CDR	Hand SCB #2 to LMP Stow LEC on platform
Assist CDR; stow CDR's PLSS antenna	Ingress

NOTE: DETAILED PROCEDURES FOR FINAL EVA CLOSEOUT ARE PRESENTED IN SECTION 8 OF THIS DOCUMENT.

End 2nd EVA	7+00 End 2nd EVA

EVA-3 TWO MAN WALKING TRAVERSE

The following pages present detailed step-by-step procedures, in a vertical timeline format, for the EVA-3 Two Man Walking Traverse. These procedures are also included in the Lunar Surface Checklist. The geology traverse contains station activities similar to those in the nominal EVA traverse. The exceptions, notably, are those in which the necessary equipment is not available due to absence of the LRV. The between station traverse times are increased to reflect the walking rate.

Assist CDR; deploy CDR PLSS antenna	0+10 Move thru hatch
Place Jett bag in hatch	
	Toss Jett bag in Quad 1
Attach LEC to handhold	Hand LEC to LMP
Confirm "GO" for 2-man EVA	Decend to surface
Transfer LEC hooks into LM	Transfer LEC hooks into LM
Attach LEC to ETB Assist CDR	Transfer ETB to surface
Disconnect and stow LEC	Attach ETB to SRC table
Recorder-OFF Verify VOX Sens (2) - Max Verify cb config Utility & floodlights - OFF	Stow LEC on ladder hook
Move thru hatch Close hatch	Retrieve LCRU batt from +Y footpad
Decend to surface	Change LCRU batt
CDR deploys LMP PLSS antenna	0+20 Deploy LMP PLSS antenna

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0+20

- Unstow BSLSS bag from MESA & stow on HTC
- Stow spare 70mm mags (from ETB) in SCB #8
- Remove SCB #7 from HTC & attach to CDR PLSS tool harness
- Attach BSLSS to CDR PLSS
- Assist CDR
- Tether scoop/ext handle
- Install 20 bag disp on 70mm cam
- Mount 70mm cam on EMU

- Get SCB #7 from +Y footpad & stow on HTC
- Remove 2 - 20 bag disp from SCB #7 & place on MESA table
- Remove core tube cap disp from SCB #7 & place on LMP PLSS tool harness
- Unstow & attach to LMP PLSS tool harness:
  - Hammer
  - Core tube tool
  - SCB #8 (from geo pallet)
  - BSLSS sample bag
  - LCRU
- LCRU Pwr Sw - INT
  LCRU Sel Sw - PMI/WB
- Tether tongs
- Install 20 bag disp on 70mm cam
- 0+30 Mount 70mm cam on EMU

Mount 70mm cam on EMU

Get traverse maps from ETB

Depart on geology traverse

0+30 Mount 70mm cam on EMU

Orient TV in traverse direction

Depart on geology traverse

NOTE: The geology traverse & task information for the EVA-3 Walking Traverse is contained in Section 4.3, Table 4.3-3 of the Lunar Surface Procedures Document, Final Edition (7/9/71).

0+40

17-4

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	5+10	
Arrive back at LM		Arrive back at LM
Assist CDR		LCRU Pwr Sw - OFF Remove LCRU from LMP PLSS & place on surface
Remove SCB #7 from CDR PLSS & stow on HTC		Discard tongs Stow 70mm cam in ETB
Photo surface under descent engine		Remove SESC from SCB #7 & open
Collect contaminated sample in SESC		Hold SESC for LMP
Photo contaminated sample area	5+20	Close & seal SESC - stow in SCB #7

Photo contaminated sample area	5+20	Close & seal SESC - stow in SCB #7
Discard scoop/ext handle		Remove SCB #8 & BSLSS sample bag from LMP PLSS tool harness & stow on MESA table
Doff BSLSS and PLSS tool harness & discard		Doff PLSS tool harness & discard
Retrieve SWC foil		(Do following sequence ONLY if LRV is at LM)
		Unstow TCU power cable
		Unstow TCU & place on LRV seat
		Remove LCRU Y-cable from LRV & attach to TCU
		Retrieve TV camera and carry to LRV
Place SWC foil in bag from MESA & stow in ETB		TV pwr sw - OFF
		Remove TV from tripod
		Mount TV on TCU
		Connect TV power cable
		Unstow HGA from canister
Get LCRU & carry to site 300' East of LM approx heading 096°		Carry HGA & TV/TCU to site 300' East of LM approp heading 090°
Assist CDR	5+30	Implace TCU staff in surface

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Assist CDR	5+30 Implace TCU staff in surface
Unstow HGA cable & discard foam	
Connect cable to LCRU	Connect TCU to LCRU
Implace HGA staff in surface and align HGA	Level TCU/TV (prop up with rocks if reqd)
	Switch LCRU - INT pwr - TV RMT
Photo installation with 70mm cam	
	Adjust LCRU dust covers
Return to LM	Return to LM
Doff 70mm cam, remove mag & stow in ETB	Remove 70mm mags from SCB #8 & stow in ETB
Unstow dust brush from geo pallet	
	5+40

Clean CDR's EMU	5+40 Clean LMP's EMU; stow LMP PLSS antenna
Ingress, carry BSLSS bag into LM	Attach LEC to SCB #7
Attach LEC to handhold	
Transfer SCB #7 into LM	
Remove SCB #7 from LEC	Transfer LEC hooks to surface
	Attach LEC & ETB
	Transfer ETB into LM
Transfer ETB into LM	
Remove ETB from LEC	Clean EMU
Discard LEC to porch	
CB(16) LTG TRACK - Close	
SW: EXTERIOR LTG-TRACK (CDR Check light on)	Check LM Dock light - ON
SW: EXTERIOR LTG - OFF	5+50 Check area

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SW: EXTERIOR LTG - OFF CB(16) LTG TRACK - Open	5+50	Check area
Stow equipment & samples in LM		Ascend ladder; carry SCB #8
Stow SCB #8 in LM		Hand SCB #8 to LMP Discard LEC
Assist CDR; stow CDR's PLSS antenna		Ingress

NOTE: DETAILED PROCEDURES FOR FINAL EVA CLOSEOUT ARE PRESENTED IN SECTION 11 OF THIS DOCUMENT.

End 3rd EVA — 6+00 End 3rd EVA

Emergency Launch Stowage
Before SEVA

LMP's PLSS	Floor
Sleep Restraints	ISA Big Pkt.
500mm Lens Camr	ISA Big Pkt.
Purse & Contents	ISA Big Pkt.
Jett Bag	ISA Big Pkt.
ISA	Hang Aft.
IV Gloves	LEVA Bag
LEVA's	LEVA Bag
LEVA Bags	Floor, 1 Lt, 1 Rt
Helmet Bag	ISA Bot. Pkt.
70mm Camr	Camr. RHSSC

Verify snaps on RH & LHSSC

EMER LAUNCH STOW

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Emergency Launch Stowage
Before EVA 1

PGA's	Don Or Tie To Eng Cover
ICG's	On Crew Or Top Boot Compt
CWG's	On Crew Or ICG Bag, LHMS
LCG's	On Crew OR On Core Tube Container
UCTA's	On Crew Or In Purse
OPS (Both)	Floor (Temporary)
70mm Camr	Camr Compt, RHSSC
ISS	ISA Big Pkt
Purse & Contents	ISA Big Pkt
ETB & Contents	ISA Big Pkt
BSLSS Bag	ISA Big Pkt
Tool Harnesses	ISA Big Pkt
CDR's Boots	Top Boot Compt Or ISA Big Pkt

LM EVA Antenna - Stow

Hammocks & Sleep Restraints	Hammock Compt, LHSSC
RCU's	RCU Shelf Or LCG Bag, LHMS
ISA	Hang Aft
EV Gloves	LEVA Bag
LEVA's	LEVA Bag
LEVA Bags	Floor, 1 Lt, 1 Rt
Helmet Bag	ISA Bot Pkt
LMP's PLSS	Donning Sta - Use 2

Adjustable Straps On Bottom: Break 2 Stitches, Remove Keeper, Extend To Max Length, Hang PLSS Upside Down, Conformal Pad Aft. Attach 2 Waist Tethers (LEC Kit, RHSSC) To Handhold On Back Of PLSS Using Small Hooks. Route One Tether To Vertical Handhold On ECS Module And One Tether To Bracket Supporting PLSS In Recharge Station. Pull Straps Tight.

OPS	Floor (Secure)
Jett Bag	Tie To Floor. Place Double Cue Card On +Z27 Dlkhd If Reqd

Fwd Hatch - Verify Locked
Verify Snaps On RH & LHSSC

EMER LAUNCH STOW

DATE 7/14/71

Emergency Launch Stowage
Before EVA 2

PGA's	Don Or Tie To Eng Cover
ICG's	On Crew Or Top Boot Compt
CWG's	On Crew Or ICG Bag, LHMS
LCG's	On Crew Or In PGA's Or In Bot Boot Compt
UCTA's	On Crew Or In Purse
OPS (Both)	Floor (Temporary)
ISS	ISA Big Pkt
SRC	SRC Compt
1 Collection Bag	Core Tube Container
Cover Bags #2,6,7 & 8	Core Tube Container
Hammock & Sleep Restraints .	ISA Big Pkt
1 Collection Bag	Hammock Compt, LHSSC
Food Bag	ISA Big Pkt
CSRC	ISA Big Pkt
Purse & Contents	ISA Big Pkt
ETB & Contents	ISA Big Pkt
Tool Harness	ISA Big Pkt
LM EVA Antenna - Stow	
ISA	Hang Aft
RCU's	LCG Bag, LHMS
EV Gloves	LEVA Bag
LEVA's	LEVA Bag
LEVA Bags	Floor, 1 Lt, 1 Rt
Helmet Bag	ISA Bot Pkt
LMP's PLSS	Donning Station. Same As Before EVA 1 Chart
OPS (Both)	Floor (Secure)
BSLSS Bag	+Z27. Place Double Cue Card On +Z27 Blkhd If Reqd

Fwd Hatch - Verify Locked
Verify Snaps On RH & LHSSC

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Emergency Launch Stowage
Before EVA 3

PGA's	Don Or Tie To Eng Cover
ICG's	On Crew Or Top Boot Compt
CWG's	On Crew Or ICG Bag, LHMSC
LCG's	On Crew Or Bot Boot Compt
UCTA's	On Crew Or In Purse
OPS's	Floor (Temporary)
ISS	ISA Big Pkt
SRC	SRC Compt
1 Collection Bag	Core Tube Cortainer
Cover Bags #7&8	Core Tube Cortainer
Mags In ICG Compt, RHSSC - Transfer To Camr Compt & Aft RHSSC	
Hammocks & Sleep Restraints	ISA Big Pkt
RCU's	RCU Shelf
LM ECS LiOH Cart & Bkt	Attached To Eng Cover
LM EVA Antenna - Stow	
1 Collection Bag	Hammock Compt, LHSSC
1 Collection Bag	LCG Compt, RHSSC
1 Collection Bag	On LCG Bag, LHMS
Food Bag	ISA Big Pkt
Purse & Contents	ISA Big Pkt
ETB & Contents	ISA Big Pkt
Tool Harnesses	ISA Big Pkt
ISA	Hang Aft
EV Gloves	LEVA Bag
LEVA's	LEVA Bag
LEVA Bags	Floor, 1 Lt, 1 Rt
Helmet Bag	ISA Bot Pkt
LMP's PLSS	Donning Station. Same As Before EVA 1 Chart
OPS (Both)	Floor (Secure)
Jett Bag	Tie To Floor. Place Double Cue Card On +Z27 Blkhd If Reqd

Fwd Hatch - Verify Locked
Verify Snaps On RH & LHSSC

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Emergency Launch Stowage
Before Equipment Jettison

Lunar Boots	Don
CDR's PLSS (Remove Adjustable Strap)	Recharge Station
OPS's	Floor (Temporary)
ISS	Jett Bag
2 Collection Bags (Together less than 40#)	ISA Big Pkt
1 Collection Bag	Core Tube Container
Jett Bag	On Core Tube Container
Mags In LCG Compt, RHSSC -	Transfer To Camr Compt & Aft RHSSC
RCU's	Boot Compts
LM EVA Antenna - Stow	
1 Collection Bag	Hammock Compt, LHSSC
1 Collection Bag	LCG Compt, RHSSC
Purse & Contents	In LCG Bag, LHMS
1 Collection Bag	On LCG Bag, LHMS
ETB & Contents	ISA Big Pkt
ISA	Hang Aft
EV Gloves	LEVA Bag
LEVA's	LEVA Bag
LEVA Bags	Floor, 1 Lt, 1 Rt
Helmet Bag	ISA Bot Pkt
LMP's PLSS	Donning Station. Same As Before EVA 1 Chart
OPS (Both)	Floor (Secure)
BSLSS/Rock Bag	+Z27. Place Double Cue Card On +Z27 If Reqd

Fwd Hatch - Verify Locked
Verify Snaps on RH & LHSSC

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EMERGENCY LIFTOFF

This Procedure Can Be Used For A Loss Of Circulation In Both Glycol Loops

*—These Steps To Be Performed ONLY For Loss of Glycol

```
*   At Time Of Glycol Failure Perform The Following:

    CB(11) AGS          - Open        CB(16) AEA - Open
           GASTA AC/DC  - Open               ASA - Open
           IMU OPR      - Open               ATCA- Open
           LGC/DSKY     - Open
           NUM LTG      - Open
    CB(11&16) ANUN/DOCK/COMPNT (2) - Open
```

********** (L/O-:45) **********

PGNS ACT

*CB(11or16) ANUN/DOCK/COMPNT-Close
*CB(11) LGC/DSKY - Close Or If
* Closed:
PRO (Hold In Until RESTART Lt-On, STBY Lt-Off, NO DAP Lt-On)
RSET

CB(16) INV 2 - Close
INV-2
BAT 5&6 - ON, tb-gray
(If BAT L-On, Remove One DES BAT & Skip Next Line)
BAT 1&3 - OFF/RESET, tb-bp

V96E
CB(11) IMU OPR - Close
(NO ATT Lt-Off In 90 Sec)
*CB(11&16) ANUN/DOCK/COMPNT - Open

DES H2O - CLOSE
ASC H2O - OPEN
WATER TANK SEL - ASC
* WATER TANK SEL - SEC
* SEC EVAP FLOW - OPEN
CABIN REPRESS - CLOSE
DES O2 - CLOSE
ASC O2 No. 1 - OPEN

IF TIME PERMITS:
Connect O2 Hose. R/R, B/B
Don Helmets And Gloves
PRESS REG A&B - EGRESS
SUIT GAS DIV - PULL/EGRESS
SUIT CIRCUIT RELIEF - AUTO

* S-BD: XMTR/RCVR - PRIM
* PWR AMPL - OFF
* CB(11) CDR AUDIO - Close
* AUDIO CONT (CDR) - NORM
* (LMP) - BU
* CB(16) SE AUDIO - Open

Configure CBs Per EMER LIFT OFF Status Charts

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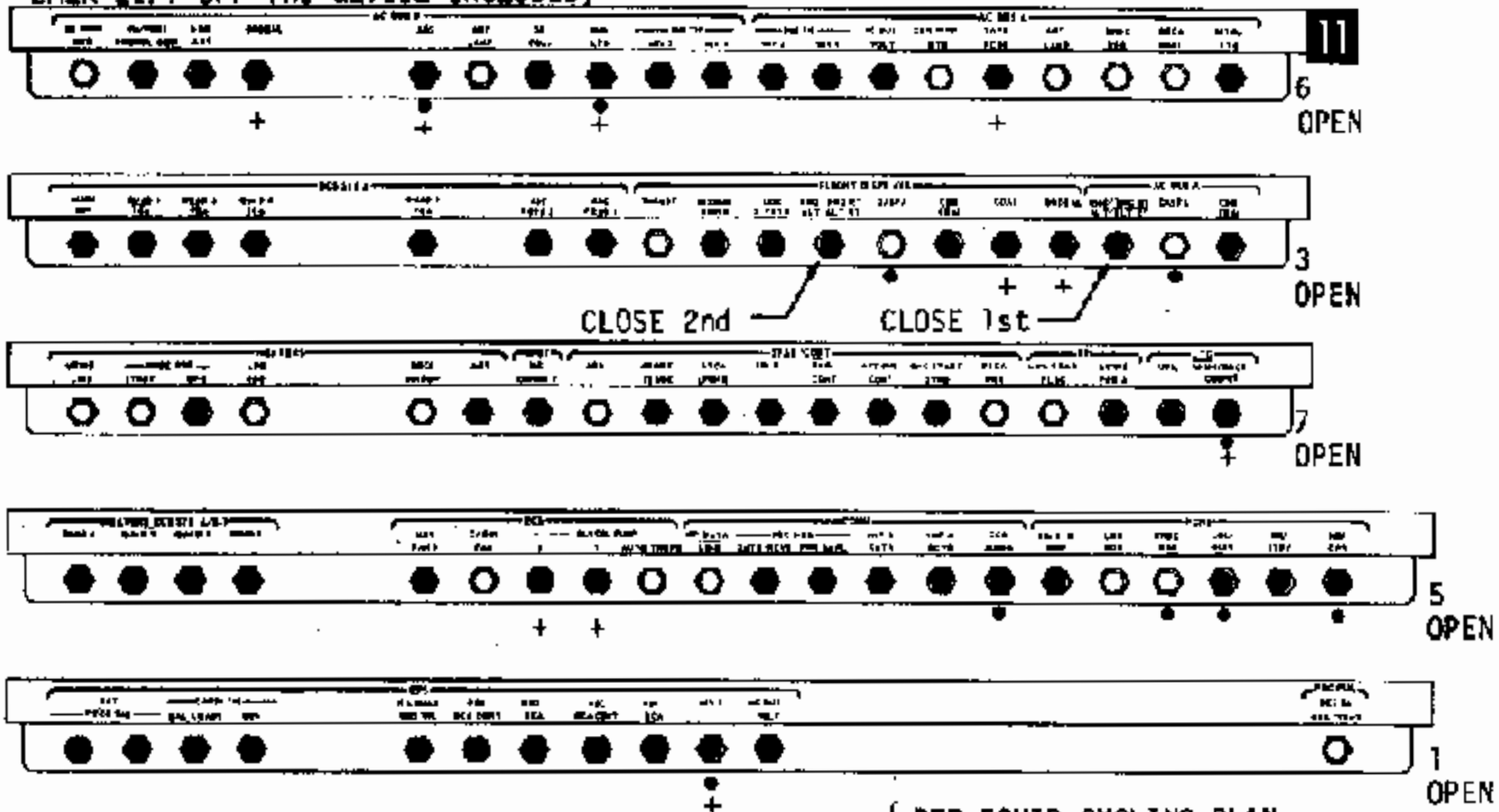
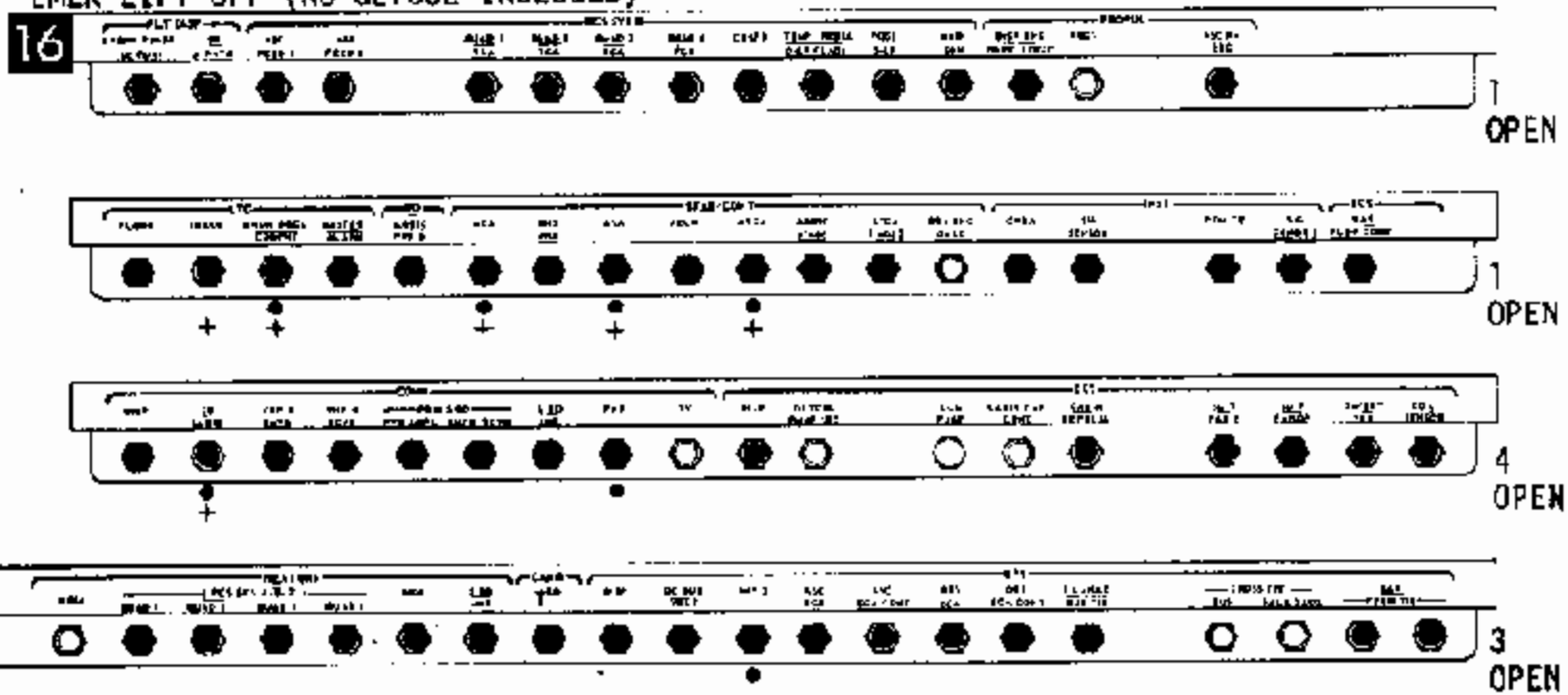
EMER LIFT OFF (NO GLYCOL INCLUDED)



• — { REF EQUIP CYCLING PLAN
CONTINGENCY C/L PG 4-7

+ — OPEN FOR LOSS OF GLYCOL

EMER LIFT OFF (NO GLYCOL INCLUDED)



• — REF EQUIP CYCLING PLAN CONTINGENCY C/L PG 4-7

+ — OPEN FOR LOSS OF GLYCOL

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MSFN-UPDATE

* CB(11) UP DATA LINK - Close
UPDATA LINK - DATA
(MSFN Updates State Vector & Increments LGC Clock)
UPDATA LINK - VOICE BU
* CB(11) UP DATA LINK - Open

NOTE: CLOCK INCREMENTED ONLY FOR A LOSS OF GLYCOL.

V16 N65E
MISSION TIMER - Set

ALIGN PGNS

CB(11) GASTA (AC/DC) - Close
P57E, OPT 4, PRO
N34 Load Time From MSFN, PRO
N06 R1 00010
00001
00010
PRO (NO ATT Lt - On/Off, Twice)
N04 + _____ Grav. Err.
PRO
N22 ICDU ANGLES
PRO (NO ATT Lt - On/Off)
N05 _____ Angle Diff
PRO

N93 Torquing Angles _____ X
PRO _____ Y
_____ Z

N25 00014 ENTR
POOE

********** (L/D-:17) **********

P____, Y____ (+75/-64)
S-BAND ANT-SLEW (>3.0)
TRACK MODE - AUTO
S-BAND RANGE - CWEA ENABLE

RCS HOT FIRE

V77E
CDR ACA (Deflect Out-of-Detent)
Roll Rt, Lt
Pitch Up, Dn
Yaw Rt, Lt

DAP LOAD

V48E, 12102, PRO
N47 LM Wt (+10,873)
PRO

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TARGET PGNS

GUID CONT - PGNS
MODE CONT (2) - AUTO
P12E
N33 ____:____:____ TIG LO
PRO
N76 _____ VH FINAL (+55095)
_____ HDOT FINAL (+00195)
_____ XRNG (+00000)
PRO

N74 TFI, YAW, PITCH
DET-Set/DN

********** (L/0-:15) **********

AGS ACT AND INITIAL

* CB(11) AGS - Close
* CB(16) AEA - Close
* ASA - Close
* ATCA - Close
AGS STATUS - OPERATE
(M.A., & AGS Warn Lt - On)

V16 N65E, 377 _____

V47E, 414+1E
400 + 3E
413 + 1E
400 + 4E

If V47 Inoperative:	
400 + 4E	Lunar Align
240 +56907	X Position Comp
261 +00030E	Y Velocity Comp
262 -00136E	Z Velocity Comp
254 + E	Epoch Time (377R)
414 + LM S.V. Via DEDA	

TARGET AGS

224 + _____ (+58118)
226 + _____ (+58118)
232 + _____ (+00600)
410 + 0
465 + _____ (+00195)
514 _____ (-53334)
515 _____ (-47371)
516 _____ (+00000)
662 + 0E
673 + 0E

* CB(11) INV 1 - Close
* INV - 1
* CB(16) INV 2 - Open

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APS PRESS

MASTER ARM - ON
ASC He SEL - TANK 1
ASC He PRESS - FIRE
HELIUM MON - ASC PRESS 2
ASC He SEL - TANK 2
ASC He PRESS - FIRE
MASTER ARM - OFF
SYS A&B ASC FEED 2 (2) - OPEN
SYS A&B MAIN SOV (2) - CLOSE

ENABLE CONTROLS

ACA PROP (2) - ENABLE
ACA/4JET (2) - ENABLE
ATT CONT (3) - MODE CONT
MODE CONT (2) - AUTO
TTCA/TRANSL (2) - ENABLE
MODE SEL - AGS
RNG/ALT MON - ALT/ALT RT

CONFIGURE COMM

* S-BD: XMTR/RCVR - SEC

VHF A: XMTR - VOICE/RNG
: RCVR - ON
VHF B: RCVR - ON
AUDIO (Both): VHF A - T/R
VHF B - RCV
RECORDER - ON

* CB(16) SE AUDIO - Close
* AUDIO CONT (CDR) - BU
* (LMP) - NORM
* CB(11) CDR AUDIO - Open

BEGIN FINAL COUNTDOWN

BATS 1,2,3,4,L - OFF/RESET,tb-bp
DES BATS - DEADFACE, tb-bp
  If tb-bp:
  CB(11&16) DES ECA (2) - Open
  CB(11&16) DES ECA CONT (2) - Open

CB(11&16) ASC ECA CONT - Open
Check APS START Card
Go To LM TIMELINE BOOK

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EMERGENCY L/O (TIME CRITICAL)

PRO (Hold In Until RESTART lt - ON)

V96E
CB(11)IMU OPR - Close
(NO ATT Lt - Out In 90s)

Configure CB(11)Per 19-3

Verify NO ATT Lt - Out
V37E 57E, OPT 4, PRO
N34 (Load LO Time) Don't PRO
V01N25E, Copy R1
V21N01E, 1570E, Load
Copied Value
PRO
N06 00010
00000
00010
PRO
N22, PRO
N25 00014, ENTR, 12E

GUID CONT - PGNS
MODE CONT (P) - AUTO

VERIFY INV - 2
BAT 5, 6 - ON, tb - gray
(If BAT L - On, Remove One
Des Bat & Skip Next Line)
BAT 1 & 3 - OFF/RESET, tb-bp

Configure CB(16)Per 19-4

AGS STATUS - OPERATE
(M.A., AGS Warn Lt - On)

400 + 4E (30 sec minimum)

342R (+0)

ENER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF
(TIME CRITICAL)

(P12)
N33, PRO
N76, +55158
+00195
+00000
PRO
N74 TFI, YAW, PITCH

MASTER ARM - ON
ASC He SEL - 1, 2, or Both
ASC He PRESS - FIRE (Other Tank)

GUID CONT - PGNS or AGS
RNG/ALT MON - ALT/ALT RT
MODE CONT (2) - AUTO
ATT CONT (3) - MODE CONT
ACA PROP (2) - ENABLE
ACA/4JET (2) - ENABLE
TTCA/TRANSL (2) - ENABLE

VHF A: XMTR - VOICE/RNG (Hot Mike to CSM)
: RCVR - ON
VHF B: RCVR - ON
AUDIO (Both): VHF A - T/R
: VHF B - RCV

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BAT 1, 2, 3, 4, L - OFF/RESET
DES BATS - DEADFACE, tb-bp
  If tb-bp:
  CB(11 & 16) DES ECA (2) - Open
  CB(11 & 16) DES ECA CONT (2) - Open

CB(11 & 16) ASC ECA CONT (2) - Open

If Time Permits:
Connect O2 Hoses R/R, B/B
Don Helmets & Gloves
PRESS REGS A & B - EGRESS
SUIT GAS DIVERTER - PULL/EGRESS
SUIT CIRCUIT RELIEF - AUTO

Go To TIMELINE BOOK

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MANUAL ASCENT

PRO (Hold In Until
  RESTART Lt-On, STBY Lt-Off)
RSET
V96E

CB(11) IMU OPR - Close
  (NO ATT Lt-Off in 90 sec)

If Time Allows:
V41N20E
Load ICDU Angles That
  Existed After Touchdown
  (See DATA BOOK Pg 6)
V40N20E (Releases IMU)
  NO DAP For 11sec

CB(11) INV 2 - Close
INVERTER - 2
BAT 5,6 - ON, tb-gray
BAT 1,2,3,4,L - OFF/RESET, tb-bp

CB(11) AGS - Close
AGS STATUS - OPERATE
  (M.A., AGS Warn Lt-On)

400 + 4E Lunar Align
Wait 30 sec Before:
400 + 0E

MODE CONTROL (2) - ATT HOLD

Configure CB's Per EMER LIFT OFF
  Charts (Pages 19-3 & 19-4)

V48E, 12102, PRO
N47 LM Wt (+10,873)
PRO

P_____, Y_____ (+75/-64)
S-BAND - SLEW (>3.0)
TRACK MODE - AUTO
S-BAND RANGE - CWEA ENABLE

V77E
CDR ACA (Deflect Out of Detent)
Roll-Rt, Lt
Pitch-Up, Dn
YAW-Rt, Lt

MASTER ARM - ON
ASC He SEL-BOTH
ASC He PRESS - FIRE

Check APS START Card
ABORT STAGE - Push
ENG ARM - ASC
DET - RESET & START At IGN
ENGINE START - Push
Go To TIMELINE BOOK For Attitude Profile

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LOSS OF VOICE COMM with MSFN (LCRU)

LCRU:

LGA: AGC <2

MODE - FM/TV (HGA) - LGA or Rcvr 1
CB LRV AUX - Close
POWER - EXT - 16.8V Batt Power

AGC >2 & POWER >1

MODE-PM1/NB (LGA) - Downlink Sig Proc

MODE-FM/TV (HGA) - S-B Xmtr or Rcvr 1 Audio

Traverse Mode: Swap Ant Connectors
MODE-PM2/NB (LGA)

AGC >2 & POWER <1

CB LCRU - CLOSE - 28V Overload

If CB opens: MODE-FM/TV (HGA)
CB LCRU - Close - - - - - - - - - - - - S-Band Xmtr Short

Traverse Mode: Swap Ant Connectors
MODE-PM2/NB (LGA)

CB LRV AUX - Close
POWER - EXT - 28V Batt Power

LRV: MALF PROC
DECAL

HGA: AGC <2.5

MODE-PM1/WB (LGA) - HGA or Rcvr 2
CB LRV AUX - Close
POWER - EXT - 16.8V Batt Power

AGC >2.5 & POWER >1

MODE - PM2/NB (HGA) - - - - - - - - - - - - - - - - - - - Downlink Sig Proc

MODE - PM1/WB (LGA) - - - - - - - - - - - - - - - - - - - S-B Xmtr or Rcvr 2 Audio

AGC >2.5 & POWER <1

CB LCRU - Close - 28V Overload

If CB Opens: MODE - PM1/WB(LGA)
CB LCRU - Close - - - - - - - - - - - - S-Band Xmtr Short
CB LRV AUX - Close
POWER - EXT - 28V Batt Power

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LRV:

AMPS NOT BALANCED

1. DRIVE POWER Sw (4) - OFF (individually)	Drive Motor Short
	DRIVE POWER - OFF DRIVE ENABLE - OFF
2. DRIVE ENABLE Sw (4) - PWM 1	PWM 2 Failure
	PWM SELECT Sw - PWM 1
3. DRIVE ENABLE Sw (4) - PWM 2	PWM 1 Failure
	PWM SELECT Sw - PWM 2
4. DRIVE POWER Sw (4) - alt. pos.	Drive Motor Power Circuit Open For One Bus
5. DRIVE POWER Sw (4) - OFF (individually) Isolate motor not drawing current	Open Circuit in Motor Not Drawing Current
	DRIVE POWER - OFF DRIVE ENABLE - OFF
6. Monitor AH meter. Reconfig. to load share as required	Cause Not Determined

LOSS OF DRIVE FROM ALL WHEELS

1. ±15 VDC Sw - alt. pos. — ±15 VDC Circuitry

2. Set Parking Brake
   DRIVE ENABLE Sw (4) - PWM 2
   PWM SELECT Sw - PWM 2
   ±15 VDC CB (2) - close — PWM 1 Shorted

3. Set Parking Brake
   DRIVE ENABLE Sw (4) - PWM 1
   PWM SELECT Sw - PWM 1
   ±15 VDC CB (2) - close — PWM 2 Shorted

4. DRIVE POWER Sw (4) - OFF (individually)
   ±15 VDC CB (2) - close — DCE Shorted

5. STEERING POWER Sw (2) - OFF (individually)
   ±15 VDC CB (2) - close — Steering Shorted

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DECAL:

POWER UP

HAND CONTROLLER
BRAKE - ON, REV - DOWN
CB: ALL CLOSED
(EX. AUX + NAV)
HOU:AMP HR, AMPS,
VOLTS, TEMPS
PWM SELECT - BOTH
DRIVE ENBL:
FWD - PWM 1
AFT -PWM 2
+15VDC - SEC
STEER: FWD - BUS A
AFT - BUS D
DRIVE PWR:
FWD - BUS A
AFT - BUS D
BRAKE - RELEASE
REVERSE - UP
BACK CLEAR OF LM
BRAKE - ON, REV - DOWN

STOP

BRAKE - ON, REV - DOWN
DRIVE PWR (4) - OFF
STEERING (2) - OFF
+15 VDC - OFF
HOU: NAV, AMP HR, TEMPS
LCRU: LM - TV RMT
TRAV - FM/TV

NAV ALIGN

STOP 3° SSD, 6° R&P
CB: NAV - CLOSE (3 MIN)
SYS RSET - RSET
BRNG, DIST, RNG - ZERO
SYS RSET - OFF
ROLL, PITCH, SSD, HDNG
GYRO TORQ TO HOU UPDATE
SSD - STOW

START

*GNOMON*GNOMON*
LCRU - PM1/WB
+15 VDC - PRIM
STEER: FWD - BUS A
AFT - BUS D
DRIVE PWR:
FWD - BUS A
AFT - BUS D

CLOSEOUT

STOP AT NAV SITE
HOU: BEARING, DIST, RNG
STOP AT LM, HEAD NORTH
CB: NAV - OPEN
BUS A, B, C, D - OPEN
HOU: LCRU COVERS
LCRU POWER - OFF
BATT COVERS OPEN
EVA 3 - CB: AUX, BUS A,
BUS C - CLOSED
LCRU - EXT PWR, TV RMT

NASA — MSC