

APOLLO 15

L M
LUNAR SURFACE CHECKLIST

PART NO

S/N

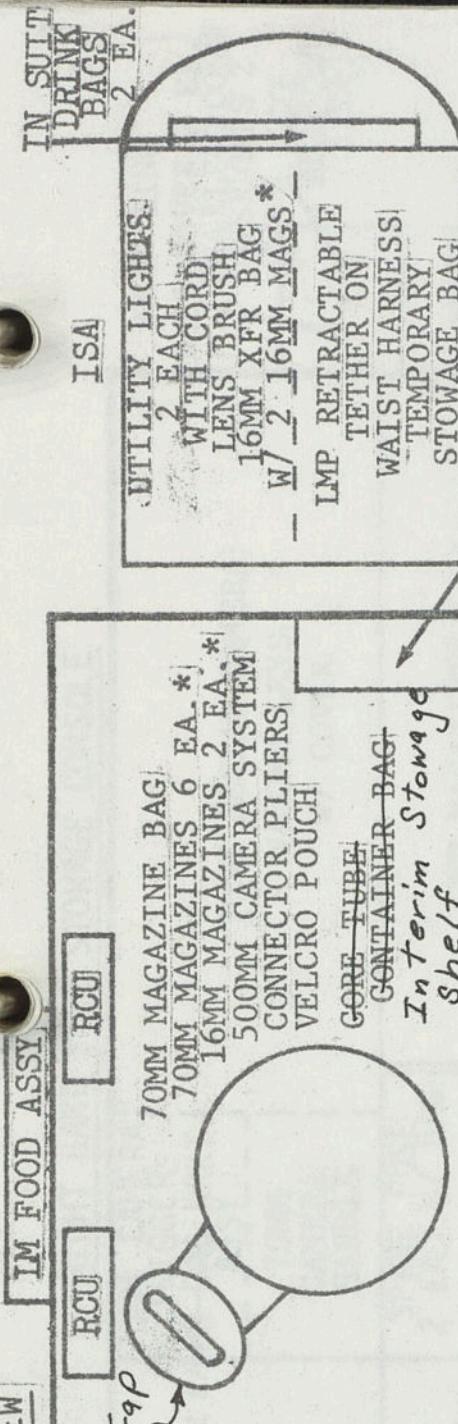
SKB32100115 - 363

1001

Flown to the lunar surface and used for 3 days
of exploration during Apollo 15 expedition to the
Hadley Apennine region of the Moon, July 26-Aug⁷, '71

Dave Scott
Apollo 15 CDR

**STOWAGE
SHELF PLAN VIEW**



IN SUIT DRINK BAGS 2 EA.

ISA

UTILITY LIGHTS

2 EACH WITH CORD
LENS BRUSH
16MM XFR BAG
W/ 2 16MM MAGS *

LMP RETRACTABLE TETHER ON
WAIST HARNESS
TEMPORARY
STOWAGE BAG

LCC'S + 2 EA

L/H MID SECTION
STOWAGE COMPARTMENT

BUINGEE CORD

DSEA

HELMET LEVA STOWAGE BAG
SLEEP RESTRAINTS 2 EA.

LMP HSB
LEVA
EV GLOVES
CUFF CHK LIST
W/ WAIST HARNESS STRAPS

LMP HSB
LEVA
EV GLOVES
CUFF CHK LIST
EMU MAINT KIT

CDR HSB
LEVA
EV GLOVES
CUFF CHK LIST

BUINGEE CORD

16MM
CAMERA
10MM
LENS
16MM
POWER
CABLE

(OVER R/H WINDOW)

(OVER R/H WINDOW)

INTERIM STOWAGE ASSEMBLY
(FRONT CENTER OF INSTRUMENT PANEL)

COAS

EARTH LAUNCH

(OVER L/H WINDOW) * CM TO LM TRANSFER

EVA 2 POST

SEVA

FIRST REV ACT



卷之三

RIGHT HAND SIDE STOWAGE CONSOLE

E M P T Y	70MM CAMERA TRIGGER 2 EA. IN 20 BAG BRKT. ASSY.	70MM CAMERA HANDLE	SPARE FUSE 2 EA. W/ BAG	70MM MAGAZINES IN TRANSFER BAG W/ 60MM LENS W/ COVER	DUST COVER 2 EA. PGAELECT CONN COVER CAPS 2 EA. * LOG ADAPTER 2 EA.
	16MM CAMERA WEDGE BRACKET	CDR/LMP CUFF CHECKLIST			DUST CAPS 2 EA. ACA PLUG VENT CAP BUNGEE CORD NEEDLE NOSE PLIERS
				16MM MAGAZINES IN TRANSFER BAG W/ DOSIMETER	WEBBING (CONTINGENCY) TIEDOWN VENT BUNGEE CORD AOT HIGH DENSITY FILTER ASSY
					AOT EYE GUARD ASSY
					EYEPATCH
				SAMPLE SCALE	
			EMPTY		

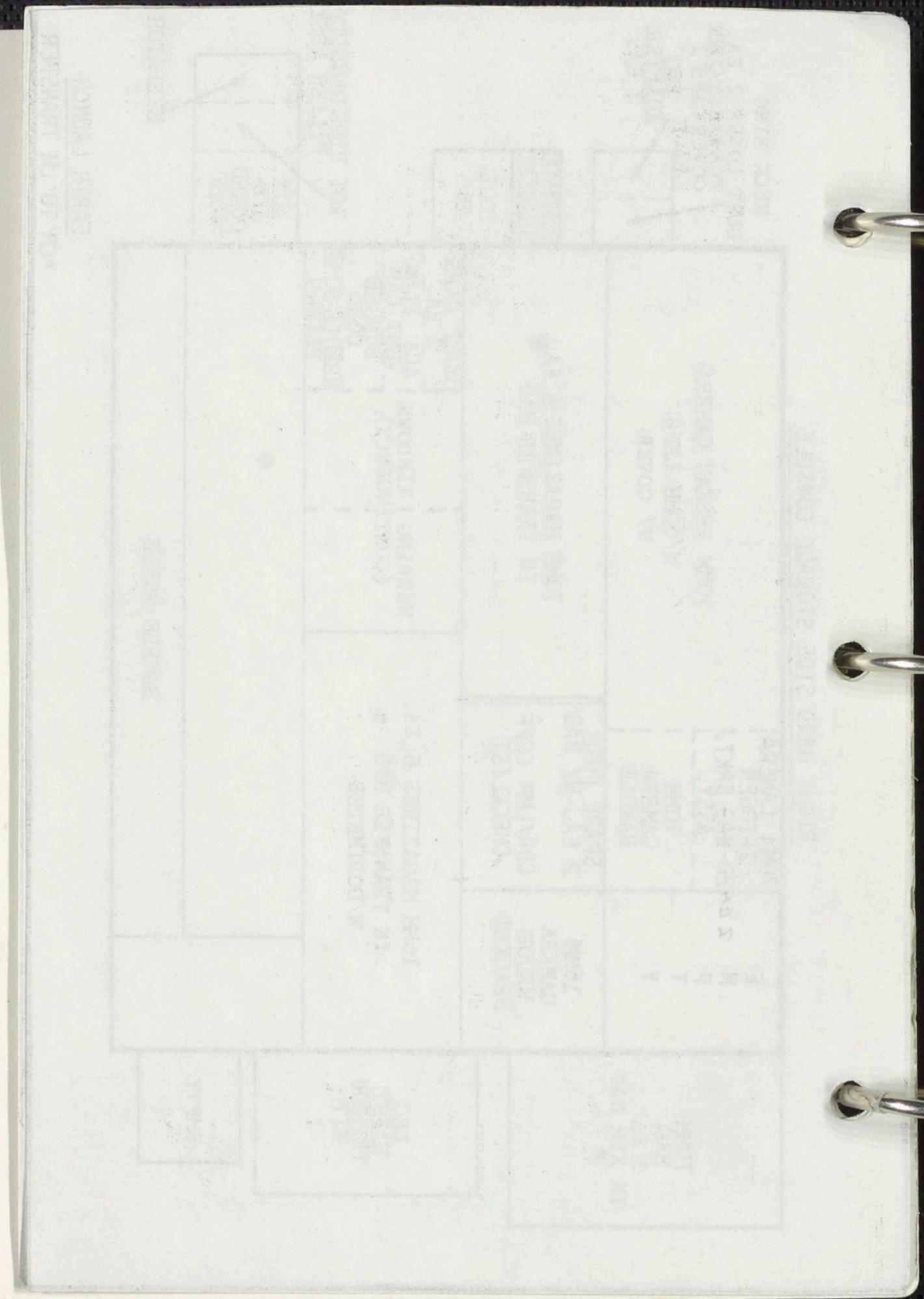
EARTH LAUNCH
*CM TO LM TRANSFER

EVA 2 POST

EVA 1 PREP

SEVA

FIRST REV ACT



LEFT HAND SIDE STOWAGE COMPARTMENT

FACIAL WET WIPE 9 EA.	URINE RECEPTACLE SYSTEM	IM --- UTILITY TOWEL ASSY 3 SETS (2 TOWELS PER SET)	DISPENSER TISUE TAPE ROLL	TISUE DISPENSER
ANCILLIARY BAG	LWHS 2 EA.*	URINE COLLECTION ASSY 2 EA.	DEFECACTION COLLECTION DEVICE 6 EA.	DISPENSER TISUE TAPE ROLL
UCTA CLAMP 2 EA.	COAS BULB			6 EA.
INFLIGHT RETAIN STRAPS 4 EA.*	COAS FILTER			6 EA.
UTILITY STRAPS 3 EA.*				2 EA.*

CDR HAMMOCK W/ TOWELS (2)

LIMP HAMMOCK W/ TOWELS (2)

EARTH LAUNCH

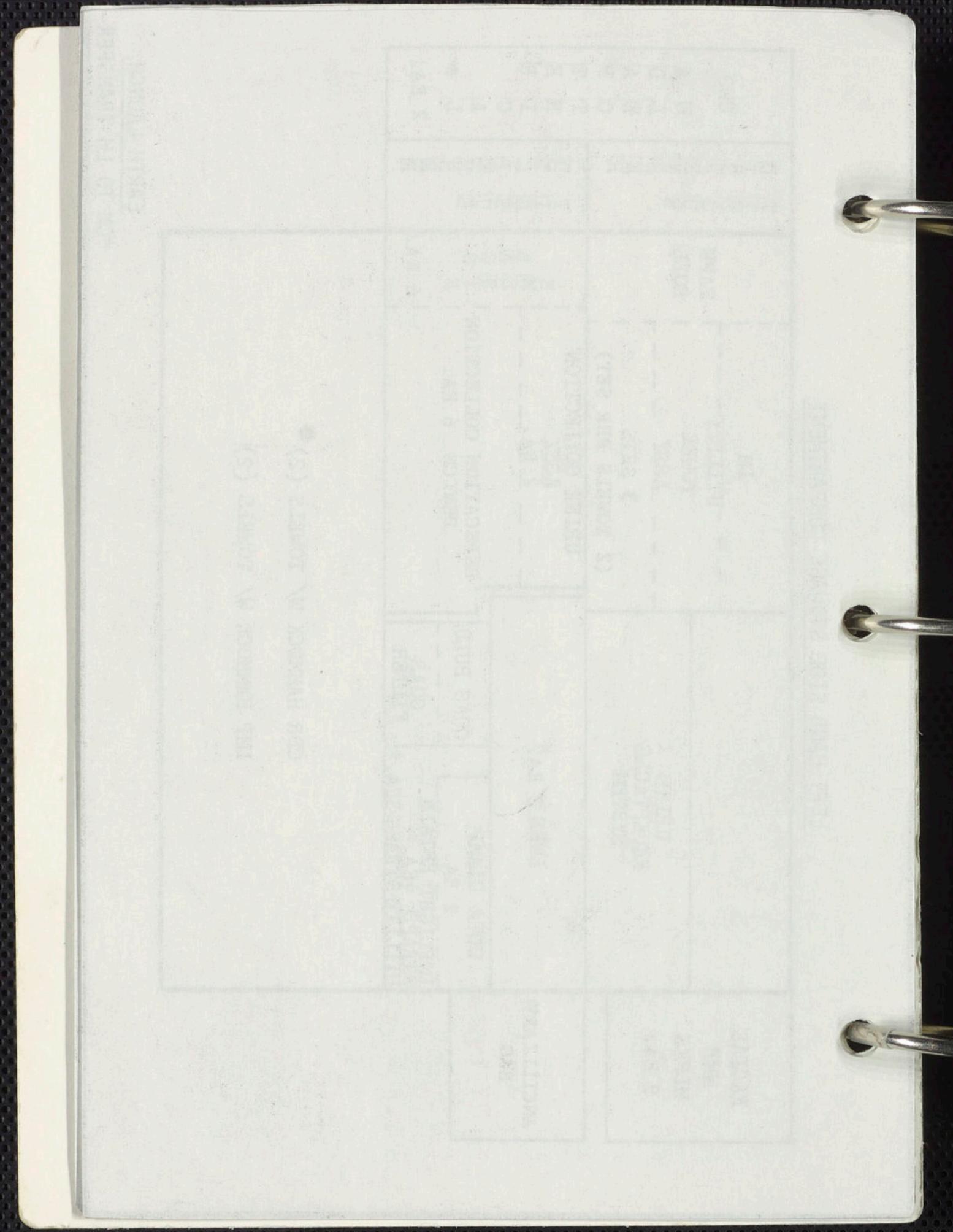
*CM TO LM TRANSFER

EVA 1 PREP

SEVA

FIRST REV ACT

EVA 2 POST



LEFT HAND MID SECTION STOWAGE

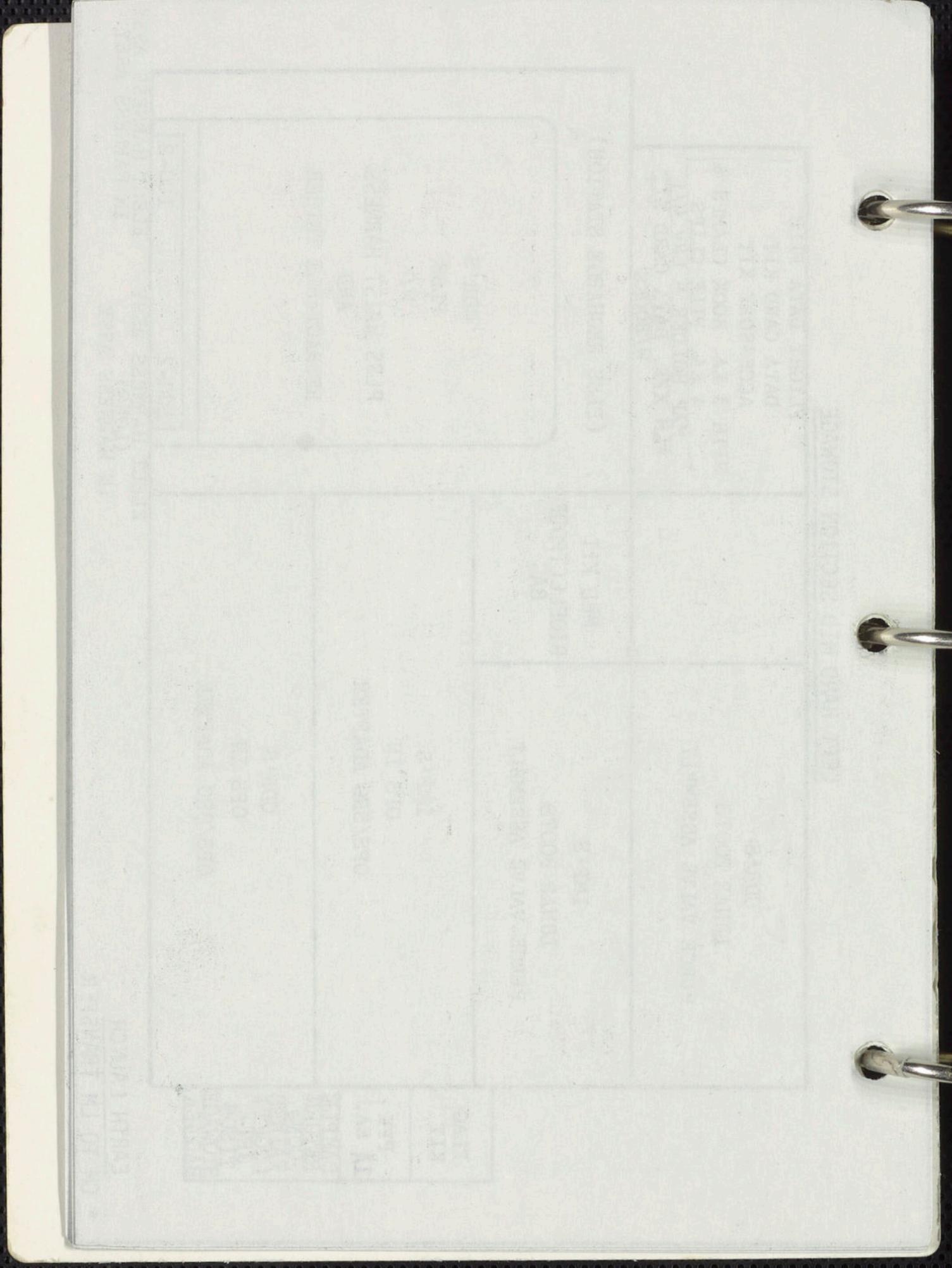
		FLIGHT DATA FILE
CDR'S LUNAR BOOTS PURGE VALVE ASSEMBLY		DATA CARD KIT ACCESSORY KIT WITH 3 EA. BOOK CLAMPS & 4 EA. FILE CLIPS MAP HOLDER - LRV C/L *LM XFR. DATA CARD KIT W/BOOKS
LMP'S LUNAR BOOTS PURGE VALVE ASSEMBLY	MED KIT BIOELECTRODE BAG	(PLSS RECHARGE STATION)
FLAG PPK 1 EA.	IMP'S OPS IN OPS/SRC ADAPTER	CDR'S PLSS W/ PLSS WAIST HARNESS AND RETRACTABLE TETHER
SAMPLE RETURN ICON TAPE (*SOFT) JETSON STOWAGE BAG 4 EA.	CDR'S OPS IN OPS/SRC ADAPTER	LCG-2 ICG-2 ELECT HARNESS ASSY (LONG) IN HARNESS ASSY

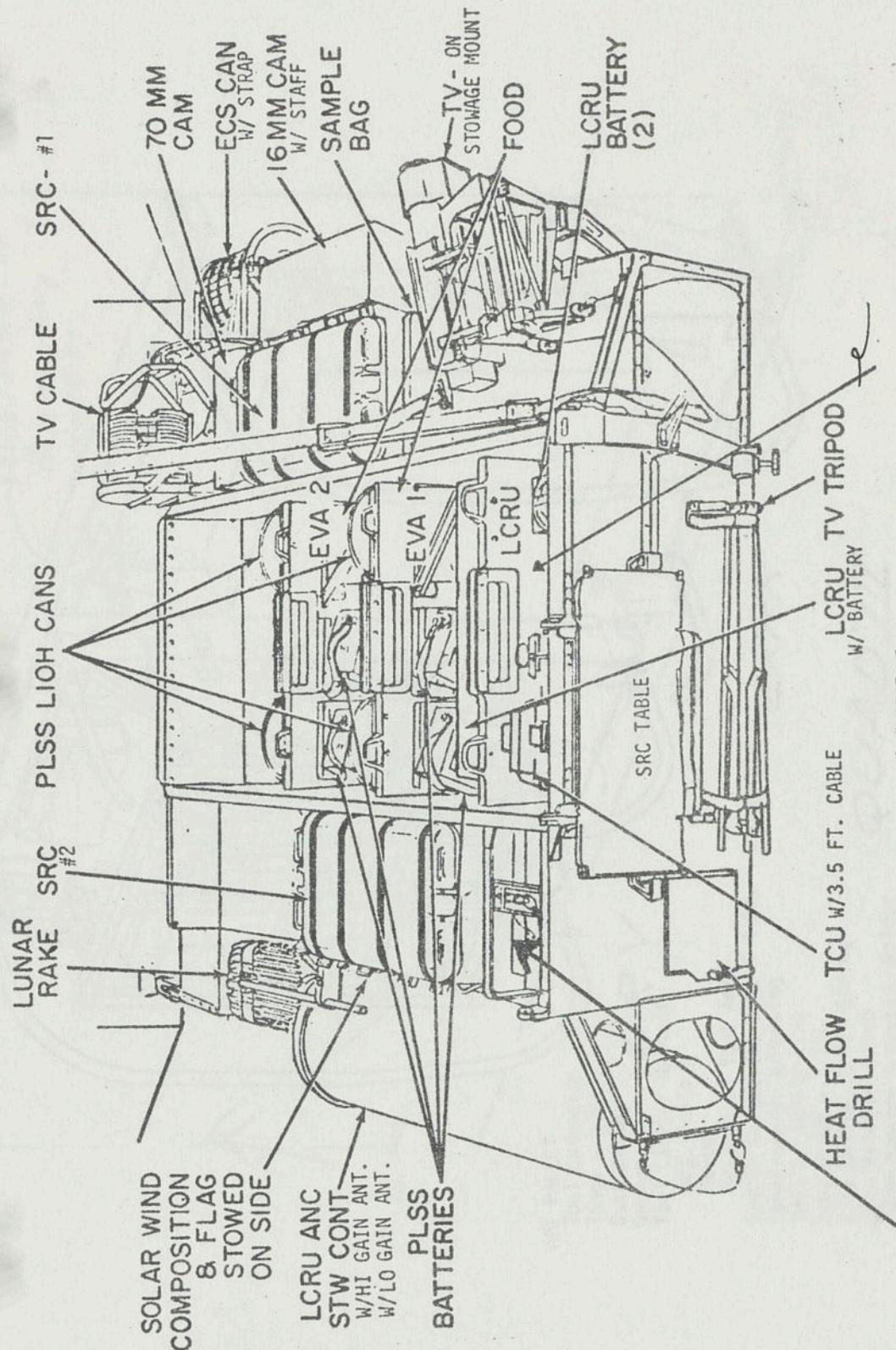
EARTH LAUNCH
* CM TO LM TRANSFER

EVA 2 POST EVA 1 PREP

SEVA

FIRST REV ACT





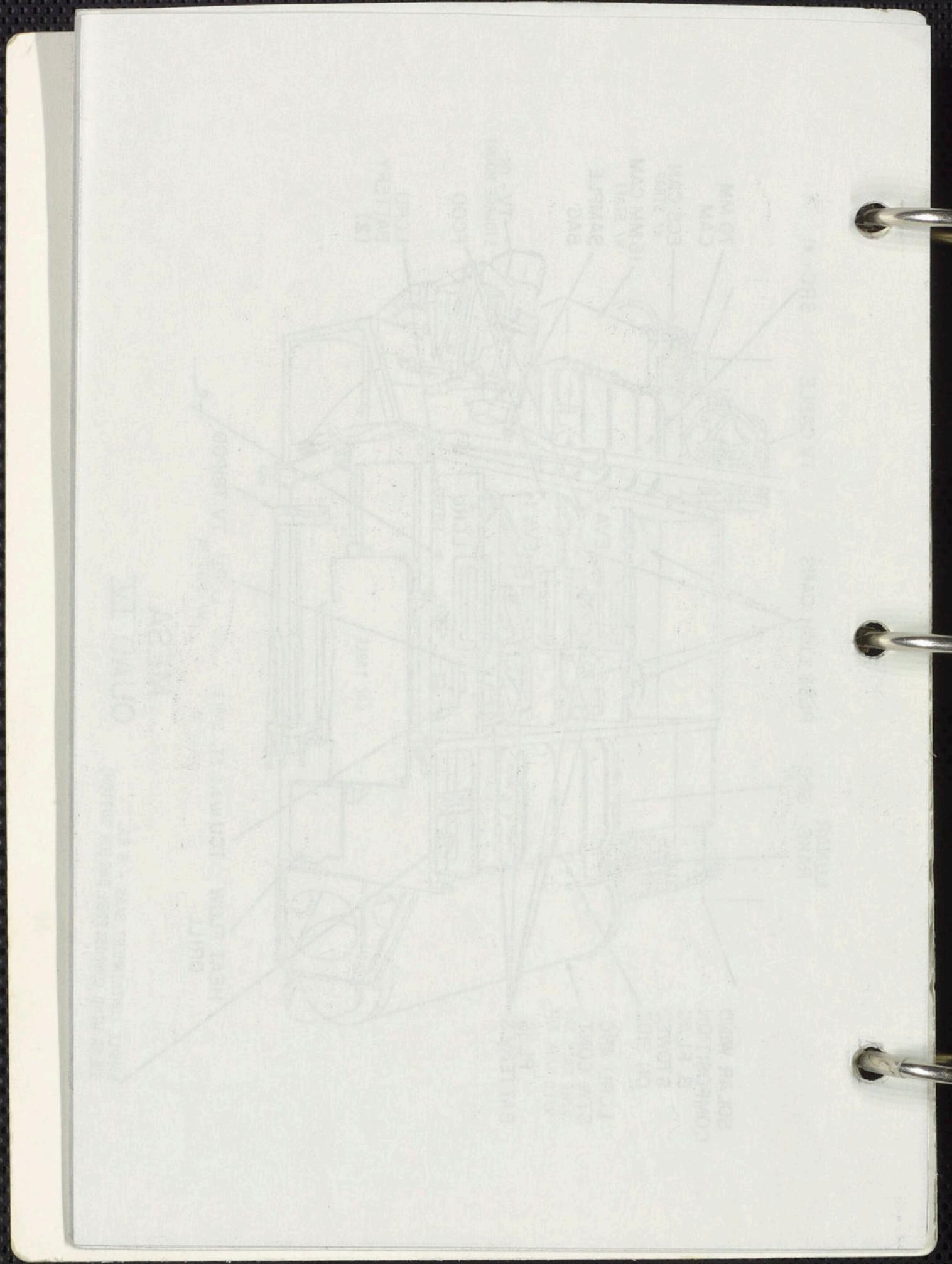
SAMPLE CONTAINMENT BAGS - 6 EA.
SOLAR WIND COMPOSITION BAG (ON BOTTOM)

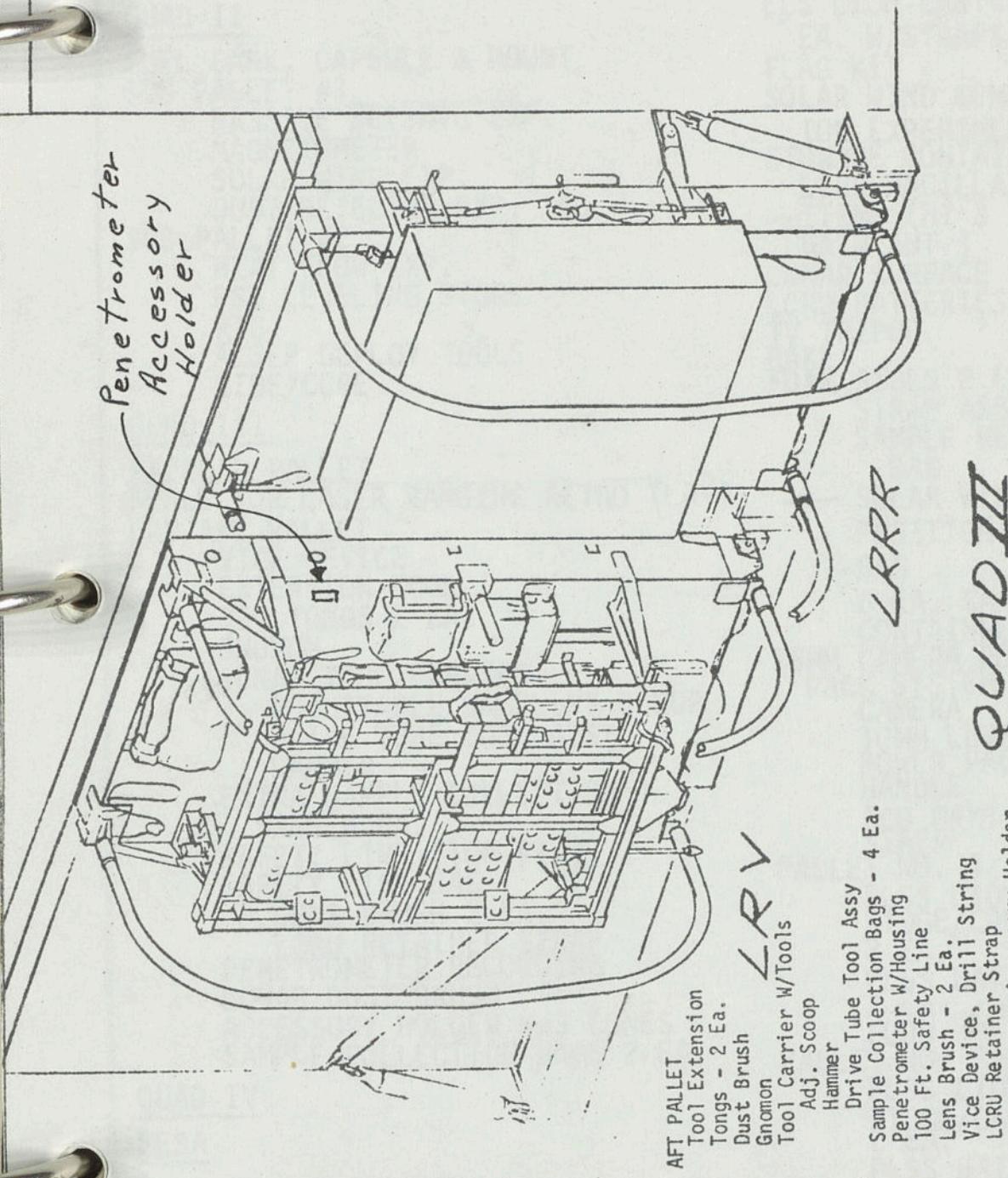
EVA 2 POST

EVA 1 PREP

SEVA

FIRST REV ACT





AFT PALLET
Tool Extension
Tongs - 2 Ea.
Dust Brush
Gnoman
Tool Carrier W[Tool]s

Adj. Scoop
 Hammer
 Drive Tube Tool Assy
 Sample Collection Bags - 4 Ea.
 Penetrometer W/Housing
 100 Ft. Safety Line
 Lens Brush - 2 Ea.
 Vice Device, Drill String
 LCR Retainer Strap
 Penetrometer Accessory Holder

QUADRI

EVA 2 POST

EVA 1 PREP

SEVA

EFFECT DEV ACT

1000

LM-10 D/S EARTH LAUNCH STOWAGE

QUAD I

LUNAR ROVING VEHICLE (LRV)
GNOMON BAG UNDER CDR SEAT
LRV DEPLOYMENT TOOL

QUAD II

FUEL CASK, CAPSULE & MOUNT
SUB PALLET #1
PASSIVE SEISMIC EXP.
MAGNETOMETER
SOLAR WIND EXP.
DUST DETECTOR EXP.
SUB PALLET #2
HEAT FLOW EXP.
PSE LEVELING STOOL
RTG
ALSEP DEPLOY TOOLS
SIDE/CCGE

QUAD III

PAYOUTLAD PALLETT
REFLECTOR LASER RANGING RETRO (LR³)
LRV AFT PALLET
VICE DEVICE
EXTENSION TOOL
32" TONGS 2 EA.
GNOMON
LUNAR TOOL CARRIER
ADJUSTABLE SAMPLING SCOOP
DRIVE TUBE TOOL ASSY
HAMMER
EXTRA SAMPLE COLLECTION
BAGS 4 EA.
SAFETY LINE (100 FT.)
SAFETY LINE BAG
LENS BRUSH 2 EA.
LCRU RETAINER STRAP
PENETROMETER RECORDING
LUNAR DUST BRUSH
ACCESSORY HOLDER W/3 CONES
SAMPLE COLLECTION BAGS 2 EA.

QUAD IV

MESA

70MM CAMERA ASSEMBLY
60MM LENS
POLARIZING FILTER
CAMERA HANDLE
CAMERA TRIGGER
RESEAU COVER
RCU BRACKET

QUAD IV - CONT'D

COLOR TV SYSTEM ON
STOWAGE MOUNT ASSY
SAMPLE RETURN CON-
TAINER NO. 1 & 2
ECS LIOH CANISTER 1
EA. W/STRAPS
FLAG KIT
SOLAR WIND COMPOSIT-
ION EXPERIMENT
STOWAGE CONTAINER
LCRU ANCILLARY
ITEMS (HI & LO
GAIN ANT.)
LUNAR SURFACE DRILL
LCRU BATTERIES 2 EA.
TV TRIPOD
RAKE
FOAM SIDES 2 EA.
STRAP ASSY.
SAMPLE RETURN
BAG

← SOLAR WIND COM-
POSITION EXP.
BAG
6 EA. SAMPLE
CONTAINMENT BAGS

T6MM CAMERA POWER
PACK SYSTEM
CAMERA
10MM LENS
POWER PACK
HANDLE
RCU BRKT.
STAFF

PALLET NO. 1
PLSS LIOH CART-
RIDGE/CANISTER
2 EA.
PLSS BATTERIES
2 EA.
FOOD

PALLET NO. 2
PLSS LIOH CART-
RIDGE/CANISTER
2 EA.
PLSS BATTERIES
2 EA.
FOOD

PALLET NO. 4
LCRU W/BATT
TCU W/3.5 FT
CABLE

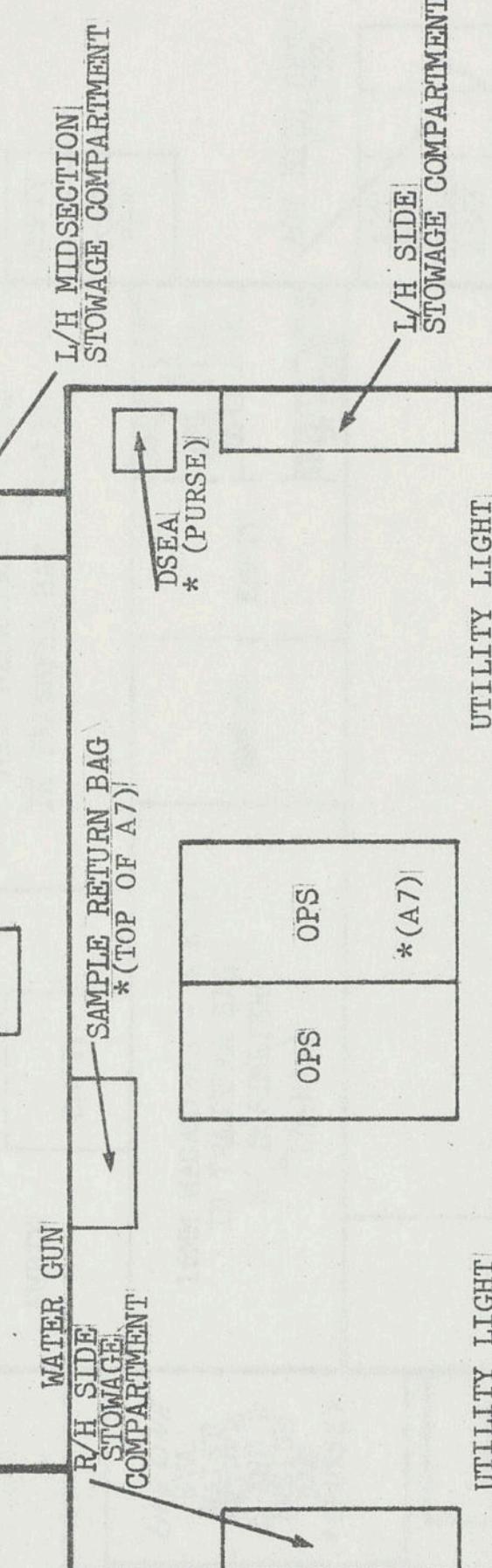
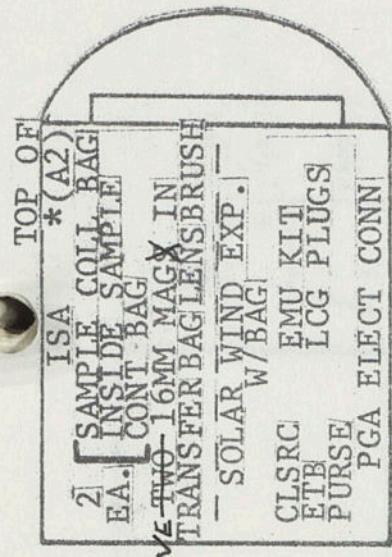
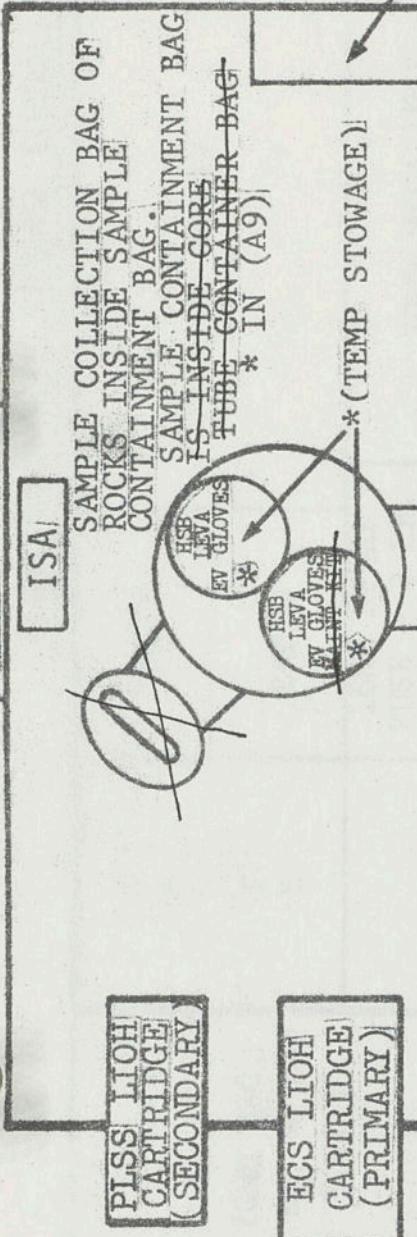
SEVA

EVA 1 PREP

EVA 2 POST

FIRST REV ACT

STOWAGE PLAN V1
LM FOOD ASSY



* LM TO CM TRANSFER

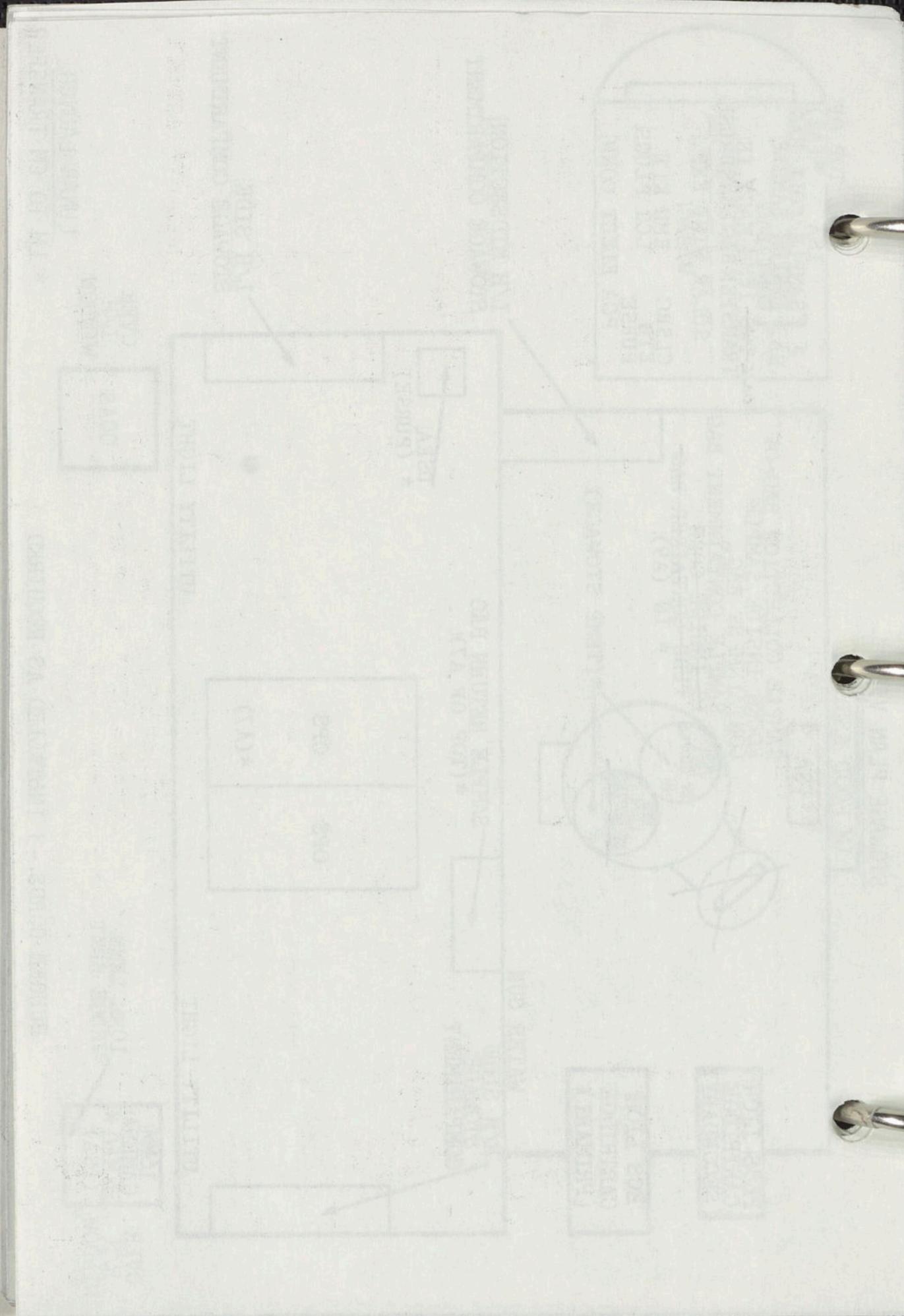
BUNGEE CORDS -3 INSTALLED AS REQUIRED

EVA 1 PREP

SEVA

EVA 2 POST

FIRST REV ACT

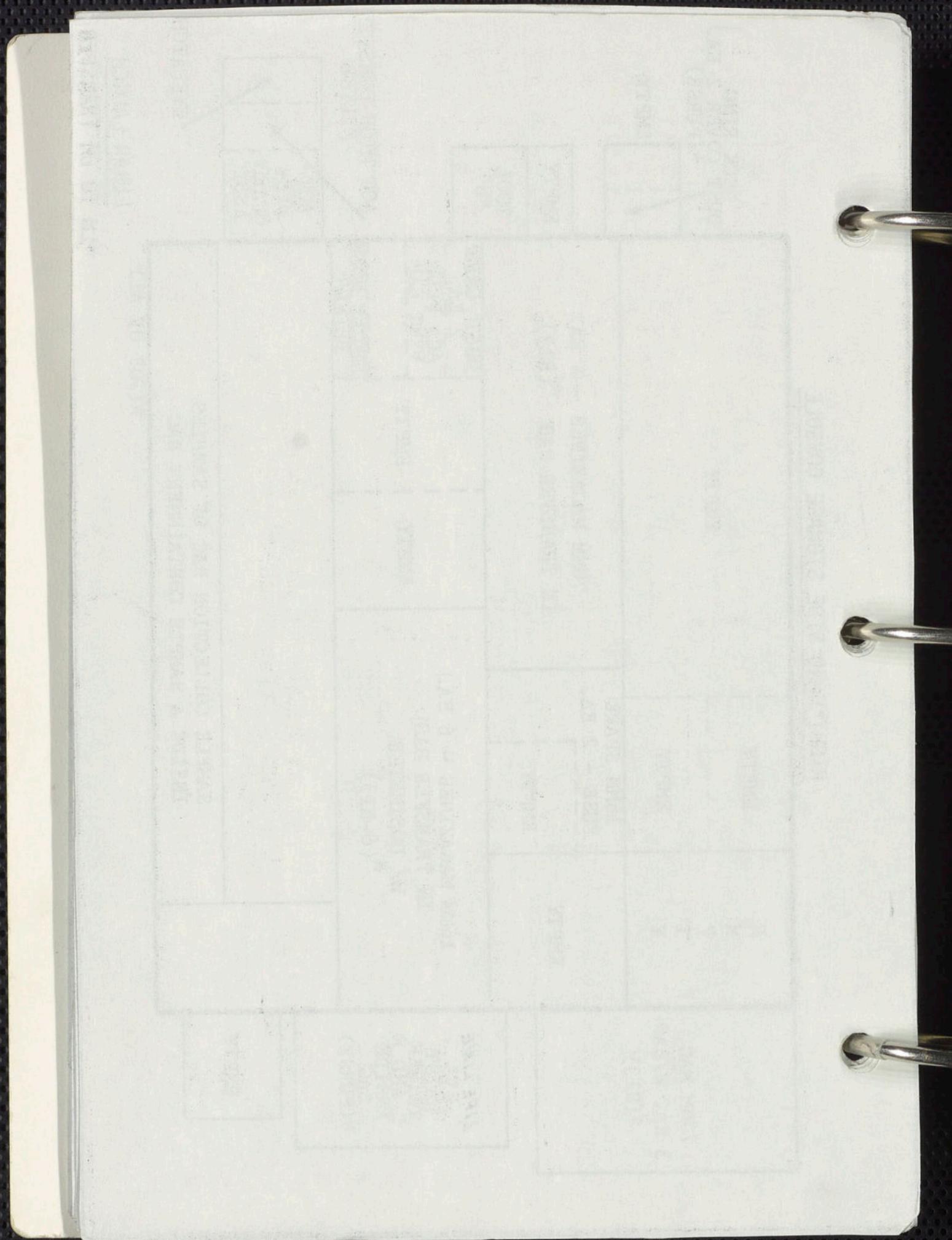


RIGHT HAND SIDE STOWAGE CONSOLE

70MM MAG. 3 EA. W/BAG *(R13)	E M P T Y	EMPTY	EMPTY	NECK RING DUST COVER 2 EA. *(PURSE)
			EMPTY	
16MM SPARE FUSE - 2 EA.	16MM SPARE FUSE - 2 EA.	70MM MAGAZINES - 4 EA. IN TRANSFER BAG *(R13)	EMPTY	TOOL "B"
	EMPTY		EMPTY	
LIFE LINE EVA WAIST TETHER L AND R INSIDE BAG *(PURSE)	16MM MAGAZINES - 6 EA. IN TRANSFER BAG W/ DOSIMETER *(6-R13)	EMPTY	DUST CAPS 2 EA. ACA PLUG VENT CAP	AOT HIGH DENSITY FILTER
		EMPTY	NEEDLE NOSE PLIERS	AOT EYE GUARD ASSY
		SAMPLE COLLECTION BAG OF SAMPLES INSIDE A SAMPLE CONTAINMENT BAG	EMPTY	EYEPATCH
			*(TOP OF A1)	LUNAR LAUNCH *LM TO CM TRANSFER

EVA 2 POST EVA 1 PREP SEVA

FIRST REV ACT



LEFT HAND SIDE STOWAGE COMPARTMENT

FACIAL WET WIPES	---	IM	---	TAPE ROLL	---	CWIG
EMPTY	---	UTILITY	---	TOWEL ASSY	---	DISPENSER
PURGE VALVE ASSY. - 2 EA. *(PURSE)1 EA.	LWHS 2 EA. * (PURSE)	URINE COLLECTION ASSEMBLIES	---	DISPENSER	---	DISPENSER
WAIST HARNESS STRAPS 4 EA.	UCTA CLAMP 2 EA.	COAS	LIGHT BULB	COAS	2 EA. *(PURSE)	RICA
				FILTER		

SAMPLE COLLECTION BAG OF SAMPLES
INSIDE A SAMPLE CONTAINMENT BAG
*(TOP OF A1)

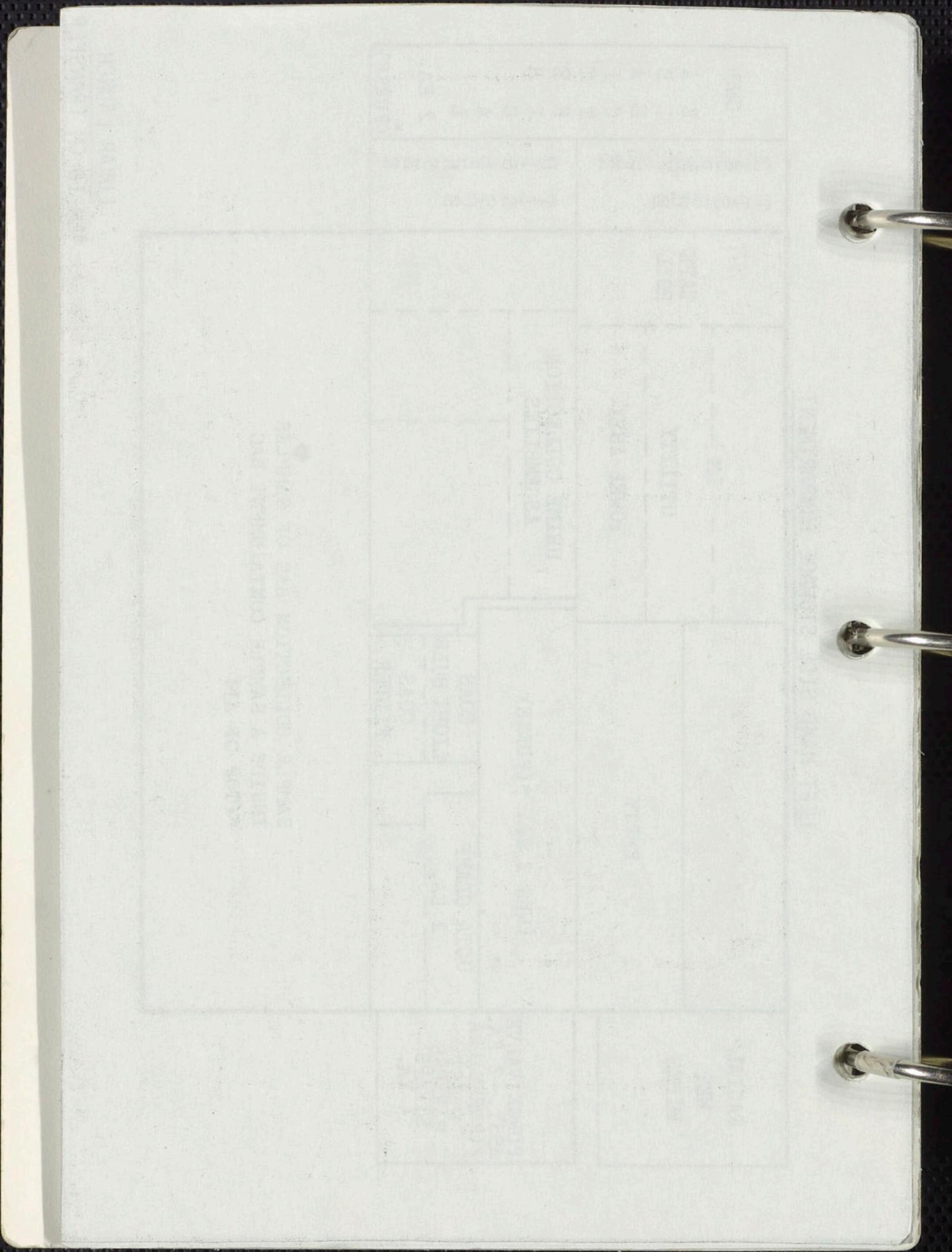
LUNAR LAUNCH
*LM TO OM TRANSFER

FIRST REV ACT

SEVA

EVA 1 PREP

EVA 2 POST



LEFT HAND MID SECTION STOWAGE

PENETROMETER RECORDING DRUM WITH RETURN COVER * (A7)	FLIGHT DATA FILE DATA CARD KIT WITH: 3 EA. BOOK CLAMPS & 4 EA. FILE CLIPS LM XFER DATA CARD KIT * (R3)
70MM MAGAZINES 3 EA. * (A8) 3 EA. * (R13) 16MM MAGAZINES 2 EA. * (R13)	MED KIT BIOELECTRODE BAG
PPK * (A8)	SAMPLE RETURN CONTAINER #1 * (B5)
FLAG KIT * (A8)	SAMPLE RETURN CONTAINER #2 * (B6)
ANCILL BAG * (A8)	SAMPLE COLLECTION BAG OF SAMPLES INSIDE A SAMPLE CONTAINMENT BAG * (AFT BLKHD IN FRONT OF A9) LGC BAG CONNECTOR PLIERS & VELCRO POUCH ELECT HARNESS (LONG) ELECT HARNESS (SHORT)

LUNAR LAUNCH
*LM TO CM TRANSFER

EVA 2 POST EVA 1 PREP

SEVA

FIRST REV ACT

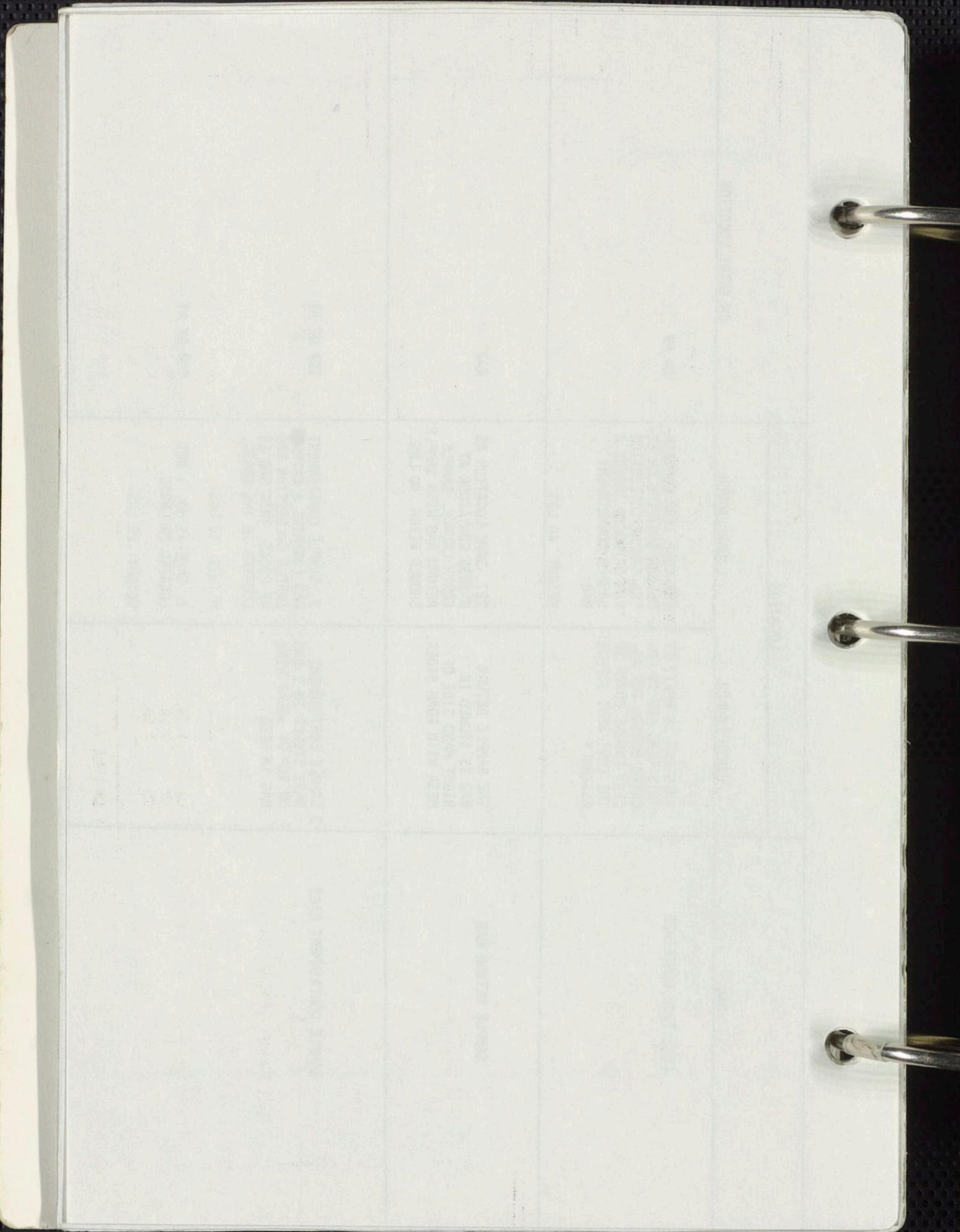
BAG	LOCATION		CM ENTRY LOCATION
	EARTH LAUNCH	LUNAR LAUNCH	
CORE TUBE CONTAINER	THIS BAG IS EMPTY AT THIS TIME AND IS LOCATED BEHIND THE ASCENT ENGINE COVER IN THE EQUIPMENT SUPPORT ASSEMBLY	THE CORE TUBE CONTAINER BAG CONTAINS AN EXTRA SAMPLE COLLECTION BAG OF ROCKS INSIDE A SAMPLE CONTAINMENT BAG.	IN A9
		WEIGHT 40 LBS.	
SAMPLE RETURN BAG	THE SAMPLE RETURN BAG IS STOWED IN RIGHT HAND SIDE OF MESA WITH FOAM SIDES.	Z27. SAME LOCATION AS B-SLSS CONTAINER AT EARTH LAUNCH. SAMPLE RETURN BAG WITH SAMPLES SHOULD WEIGH 40 LBS.	A-7
SAMPLE CONTAINMENT BAGS	5 SAMPLE CONTAINMENT BAGS STOWED IN 1 BAG ON TOP OF SOLAR WIND BAG IN MESA	1. SAMPLE CONTAINMENT BAG CONTAINS 1 EXTRA SAMPLE COLLECTION BAG OF ROCKS. THIS BAG IS LOCATED IN THE RHSSC. WEIGHT 20 LBS. 2. SAME AS NO. 1 BUT LOCATED IN LHSSC. WEIGHT 20 LBS.	TOP OF A1 TOP OF A1

EVA 2 POST

EVA 1 PREP

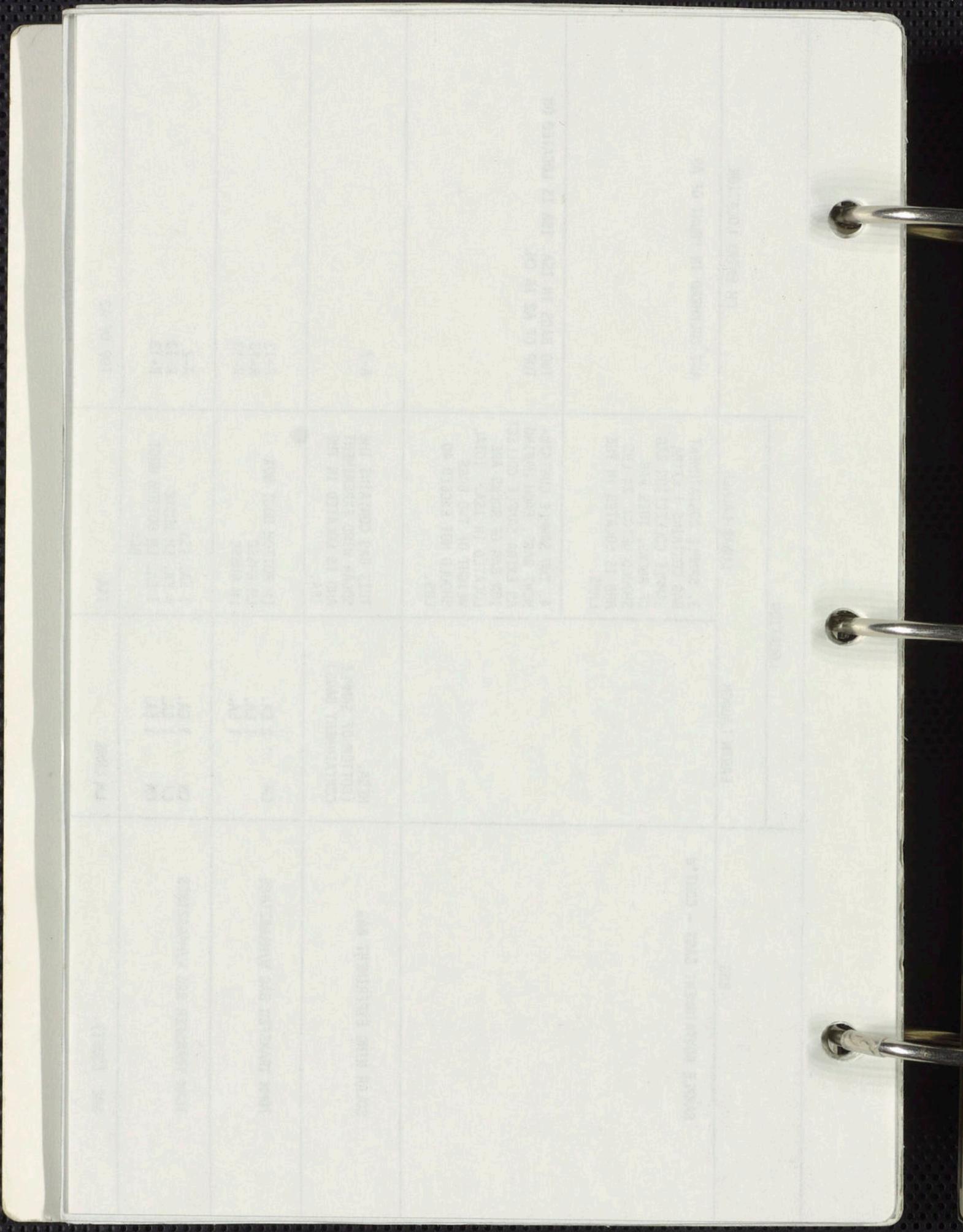
SEVA

FIRST REV ACT



DATE
11-13-71

BAG	LOCATION		CM ENTRY LOCATION
	EARTH LAUNCH	LUNAR LAUNCH	
SAMPLE CONTAINMENT BAGS - CONT'd		3. SAMPLE CONTAINMENT BAG CONTAINS 1 EXTRA SAMPLE COLLECTION BAG OF ROCKS. THIS BAG SHOULD WEIGH 24 LBS AND IS LOCATED IN THE LHMS.	AFT BULKHEAD IN FRONT OF A9
		4. TWO SAMPLE CONTAINMENT BAGS, EACH HAVING AN EXTRA SAMPLE COLLECTION BAG OF ROCKS ARE LOCATED IN ISA. TOTAL WEIGHT OF TWO BAGS SHOULD NOT EXCEED 40 LBS.	TWO BAGS IN ISA. ISA IS LOCATED ON TOP OF A2 IN CM.
SOLAR WIND EXPERIMENT BAG		MESA. (BOTTOM OF SAMPLE CONTAINMENT BAGS)	THIS BAG CONTAINS THE SOLAR WIND EXPERIMENT AND IS LOCATED IN THE ISA.
70MM TRANSFER BAG W/MAGAZINES	CM	2 EA. 1 EA. 1 EA.	LM BOTTOM BOOT BOX LM RHSSC LM RHSSC
16MM TRANSFER BAG W/MAGAZINES	CM	1 EA. 1 EA. 1 EA.	1 EA. ISA 1 EA. LM RUSSC 1 EA. LM BOTTOM BOOT BOX.
SRC (SOFT)	LM LHMS		TOP OF A2
EVA 2 POST	EVA 1 PREP	SEVA	FIRST REV ACT



v
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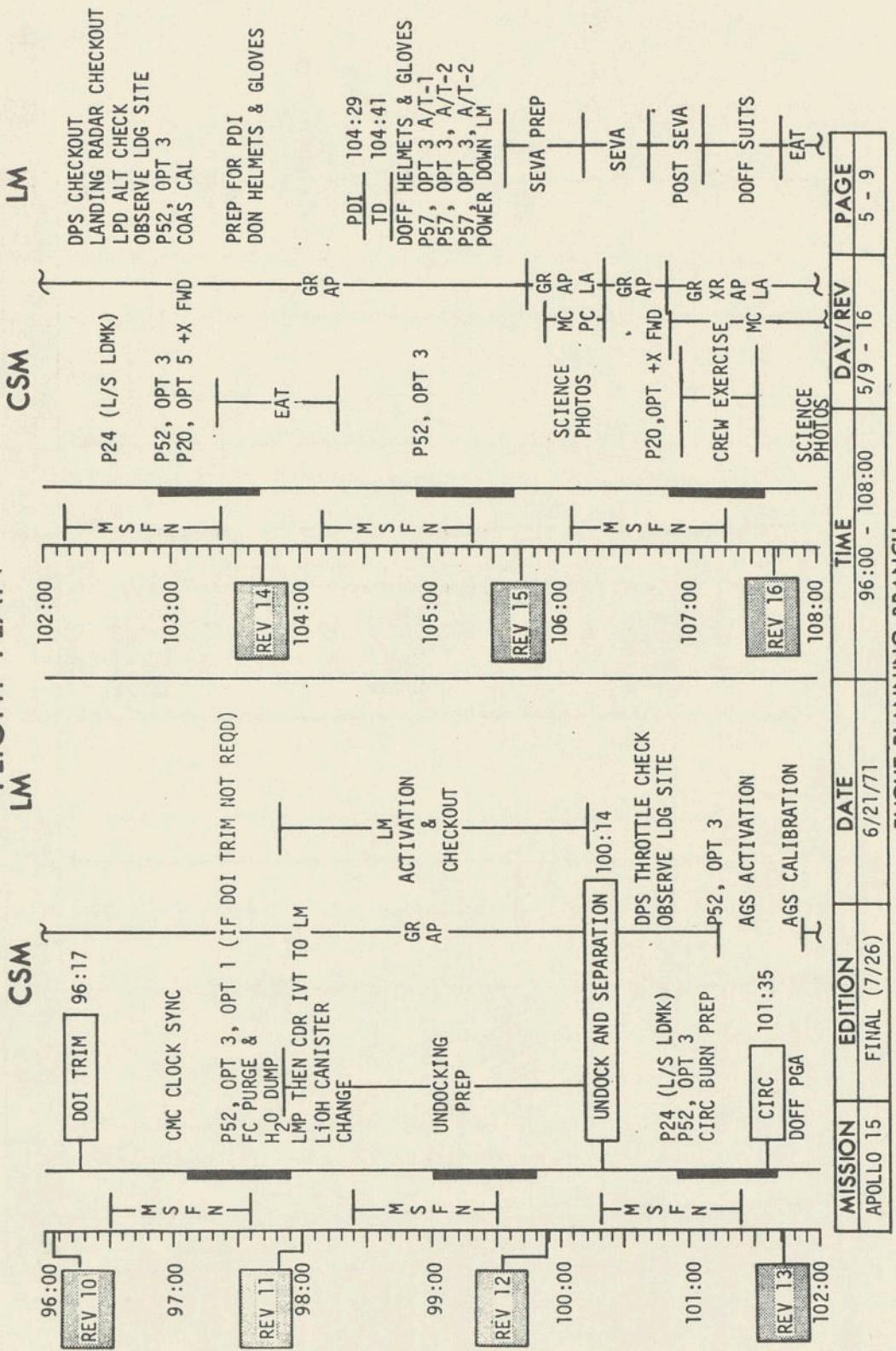
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DATE _____

DATE 6/30/71

FLIGHT PLAN



EVA 1 PREP

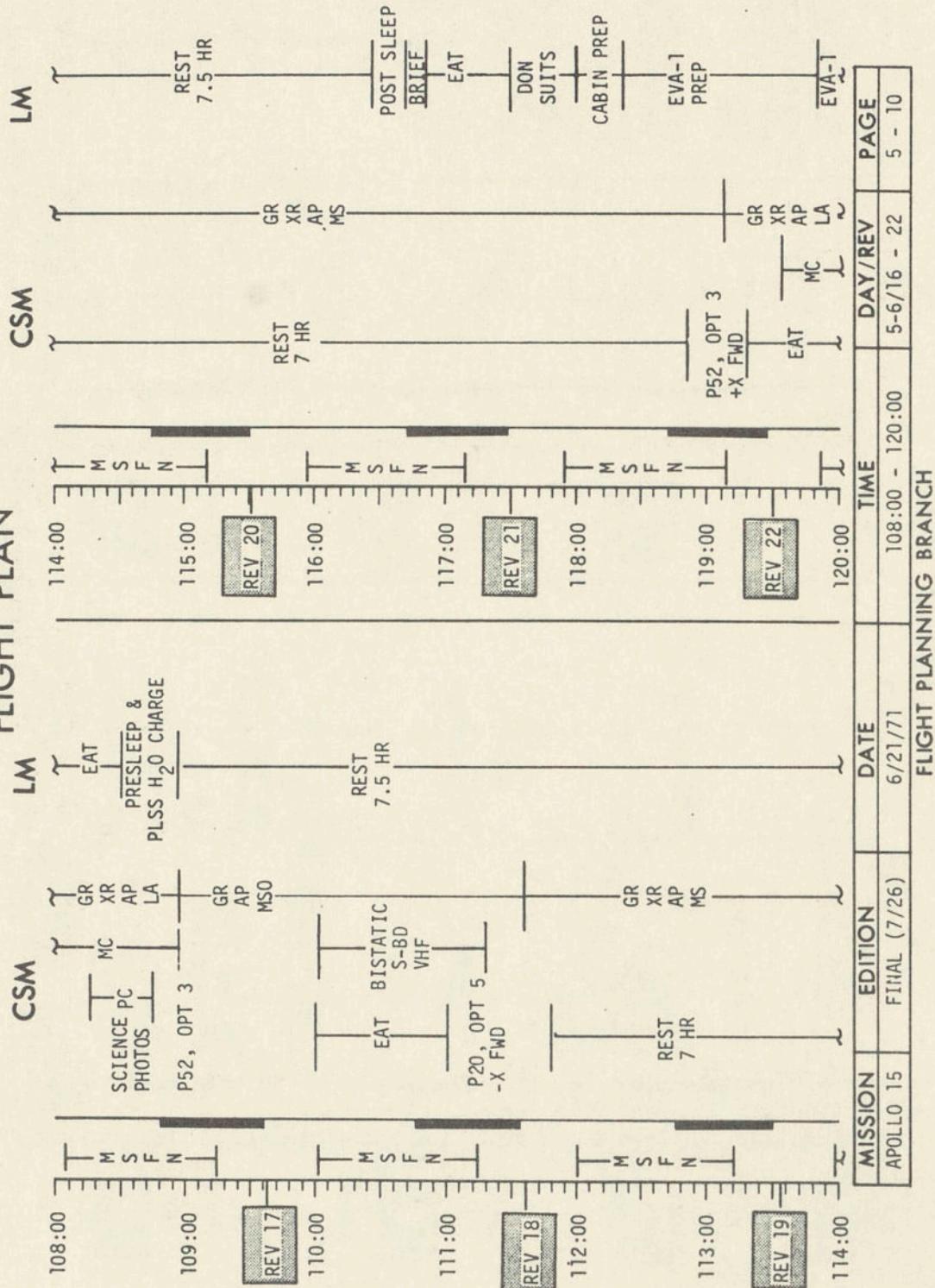
EVA 2 POST

FLIGHT PLANNING BRANCH

a

FIRST REV ACT
SEVA

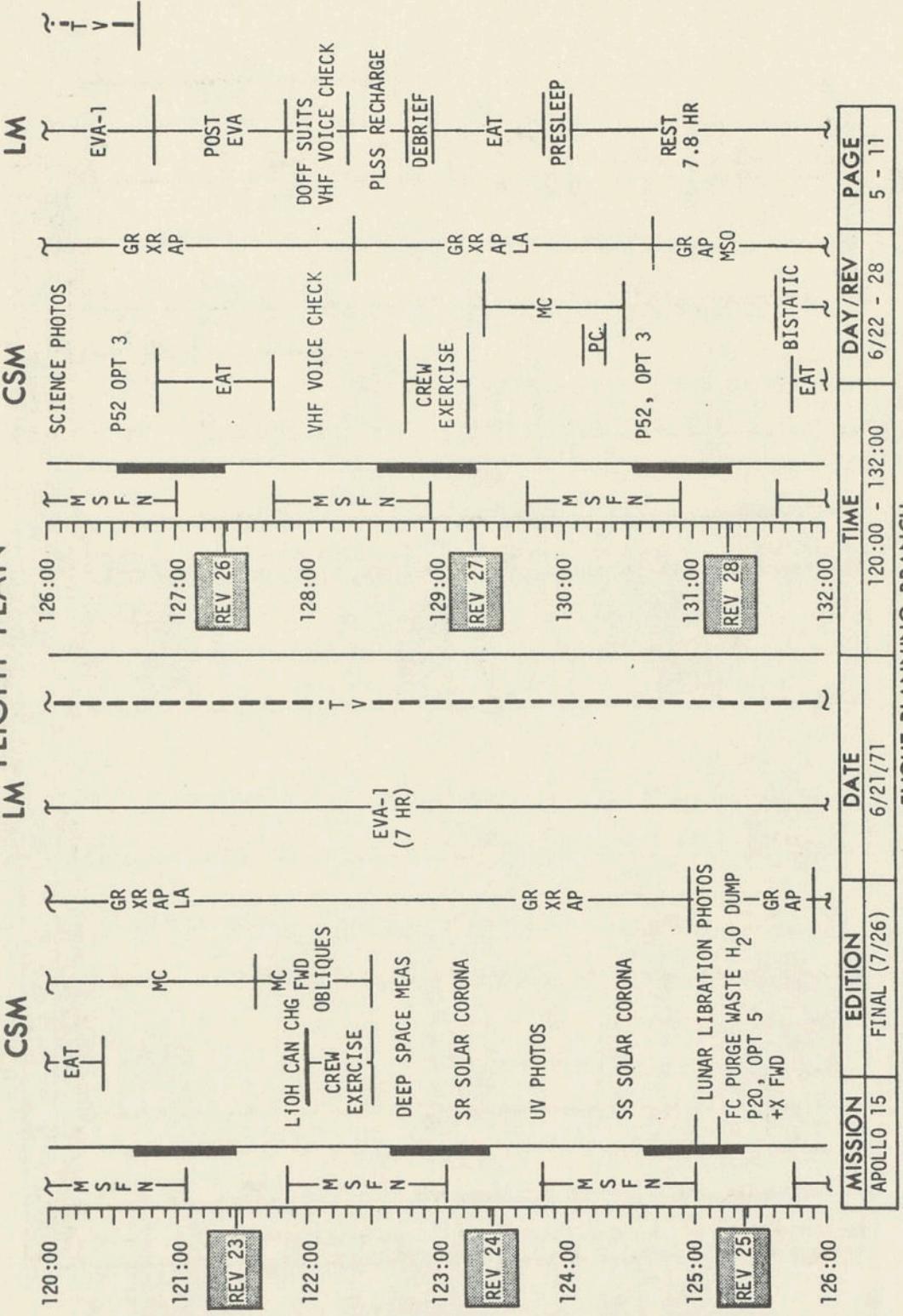
FLIGHT PLAN



DATE 6/30/71

DATE 6/30/71

FLIGHT PLAN



FLIGHT PLANNING BRANCH

C

EVA 1 PREP

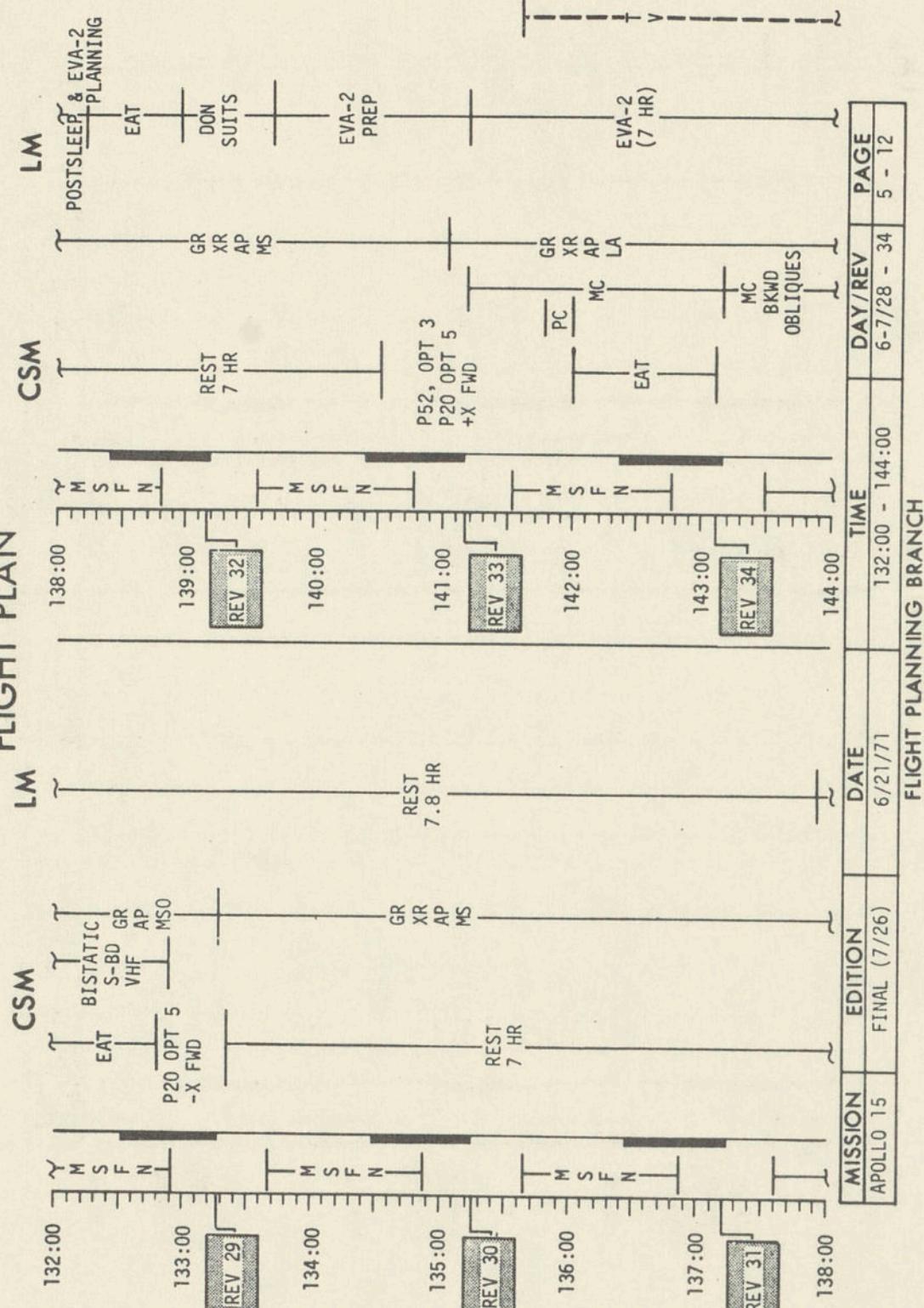
EVA 2 POST

SEVA

FIRST REV ACT

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 15	FINAL (7/26)	6/21/71	120:00 - 132:00	6/22 - 28	5 - 11

FLIGHT PLAN



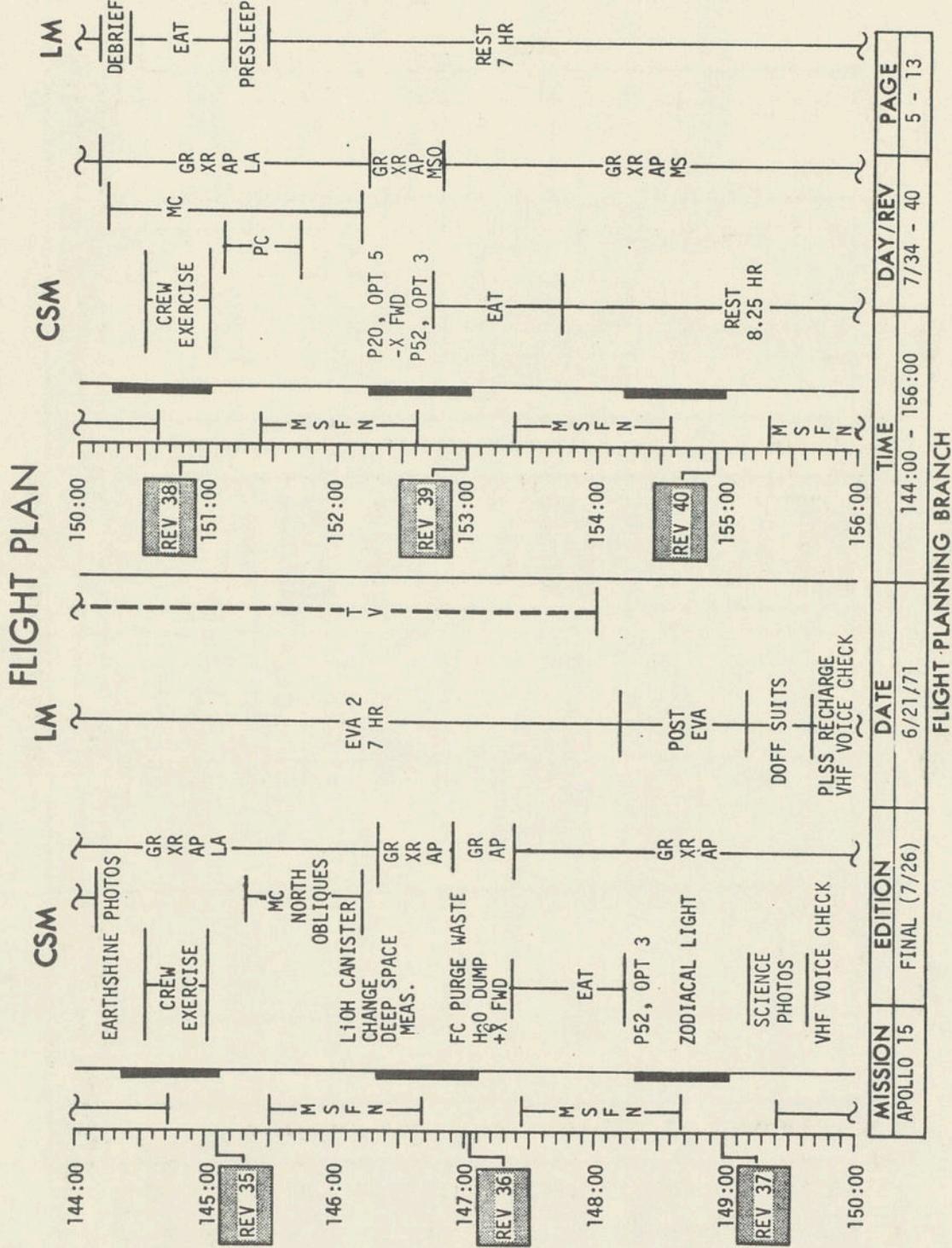
FLIGHT PLANNING BRANCH

d

DATE 6/30/71

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 15	FINAL (7/26)	6/21/71	132:00 - 144:00	6-7/28 - 34	5 - 12

DATE 6/30/71



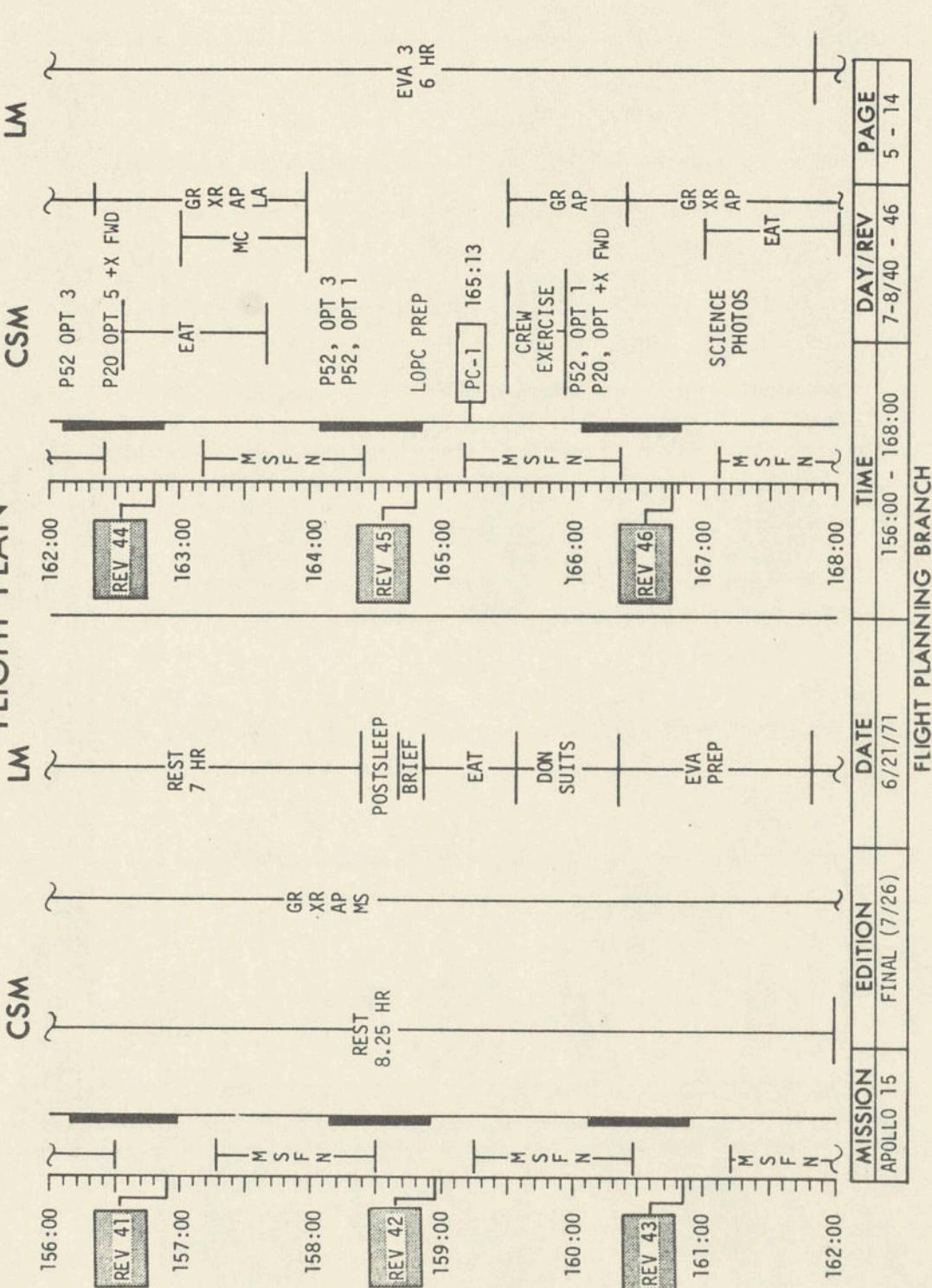
EVA 2 POST

EVA 1 PREP

SEVA

FIRST REV ACT

FLIGHT PLAN



FLIGHT PLANNING BRANCH

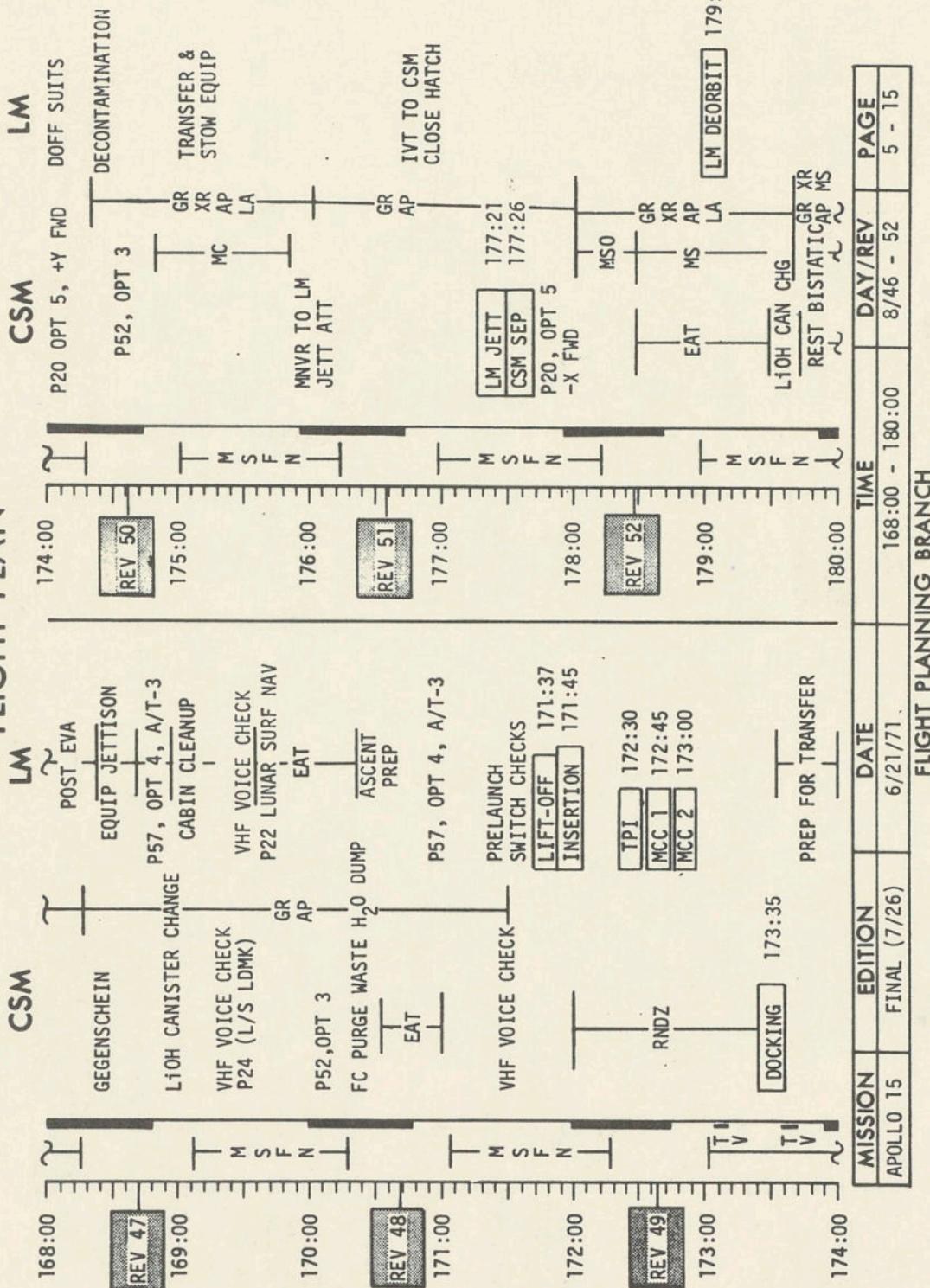
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DATE 6/30/71

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 15	FINAL (7/26)	6/21/71	156:00 - 168:00	7-8/40 - 46	5 - 14

DATE 6/30/71

FLIGHT PLAN



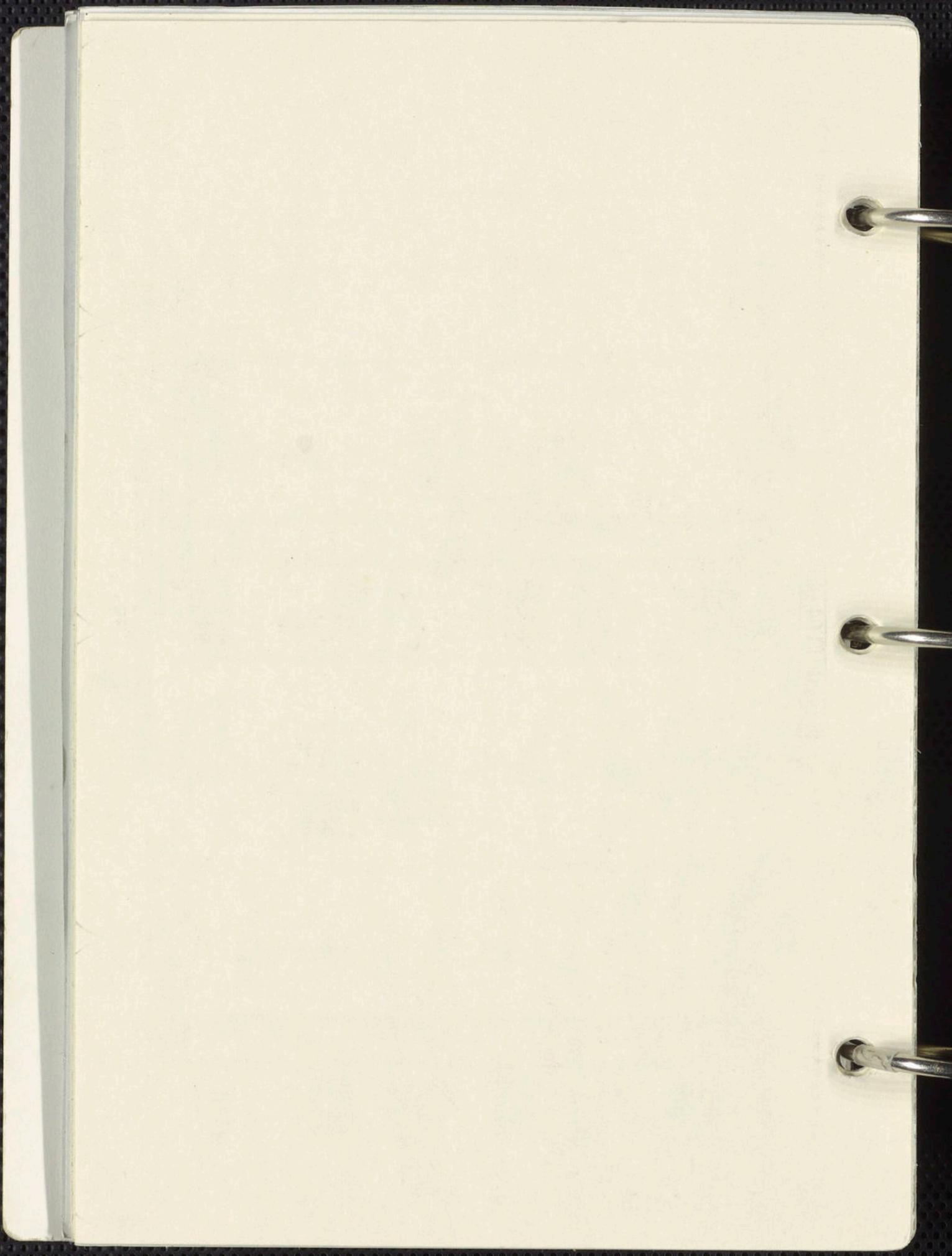
g

EVA 2 POST

EVA 1 PREP

SEVA

FIRST REV ACT



DATE 6/30/71

7/19/71

***** 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

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

Doff Helmet & Gloves
Reverse 02 Hoses R/B, B/R
PGA Diverter V1vs - IV (Horz)
SUIT ISOL (2) - SUIT FLOW
Remove & Stow Restraints (CDR's To Floor Fittings)

V16 N20E	0G	(.01°)	Sin Az (To MSFN)
Record	IG	MG	Cos Az (To MSFN)
			X Gyro Coeff (.01°/hr)
			Y Gyro Coeff
			Z Gyro Coeff

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

1-1

EVA 2 POST

EVA 1 PREP

SEVA

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, P00E

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 4.2

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

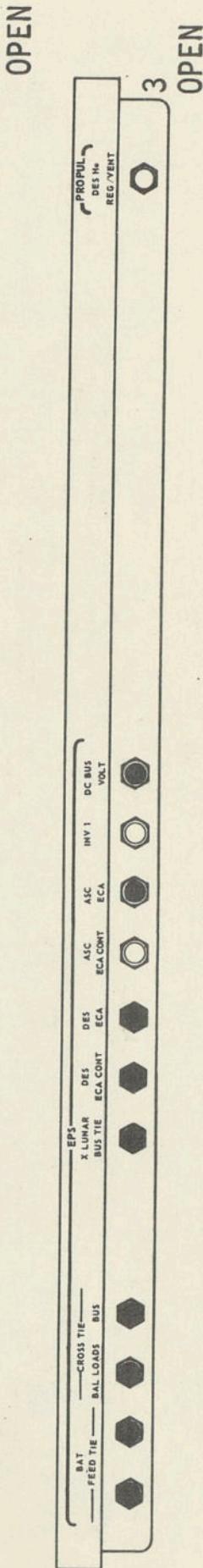
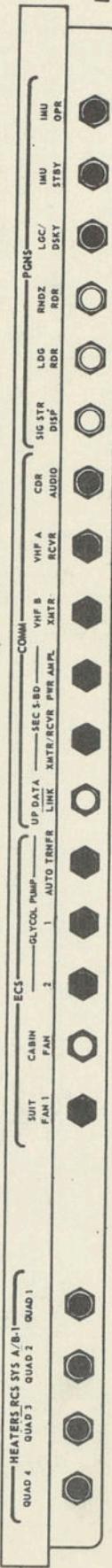
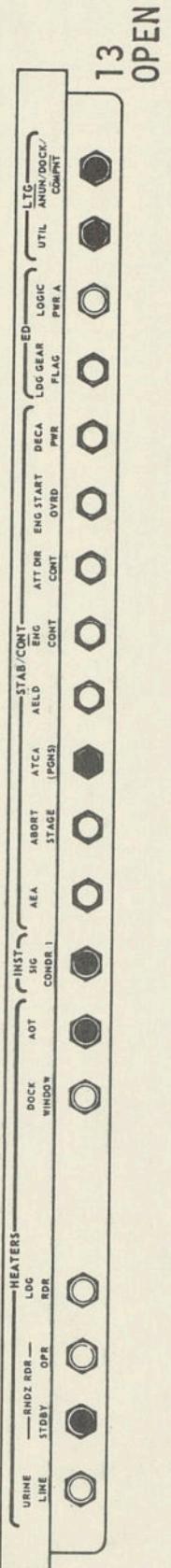
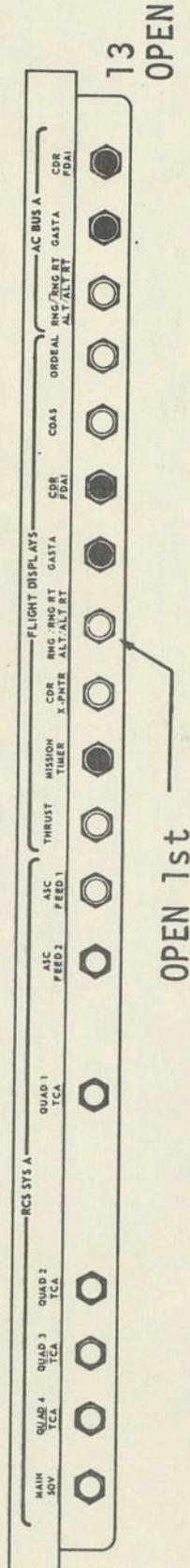
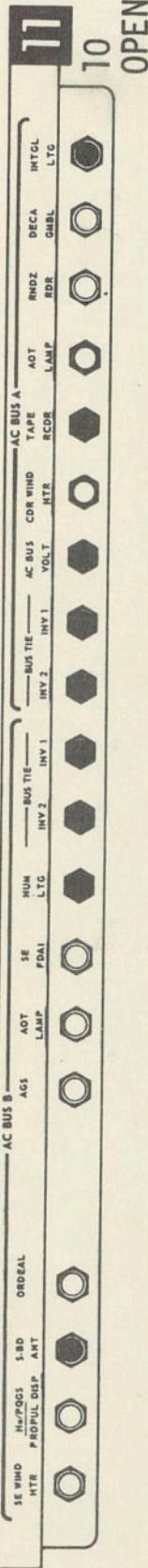
Configure CB's per PARTIAL PWR DN Charts &
Reset CES AC & CES DC Warn Lts.

1-2

DATE 7/14/71

DATE 5/10/71

PARTIAL PWR DN



1-3

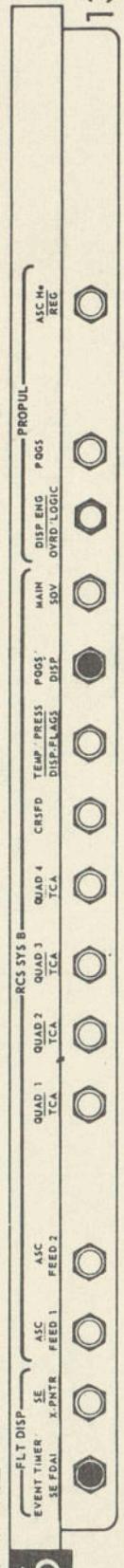
EVA 1 PRFP

SEVA

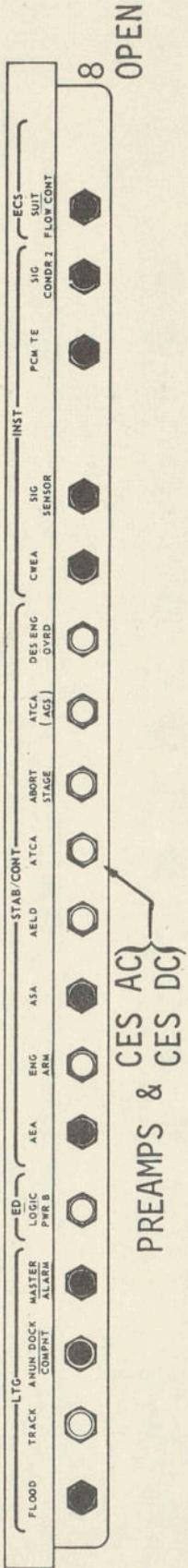
EVA 1 POST

PARTIAL PWR DN

16



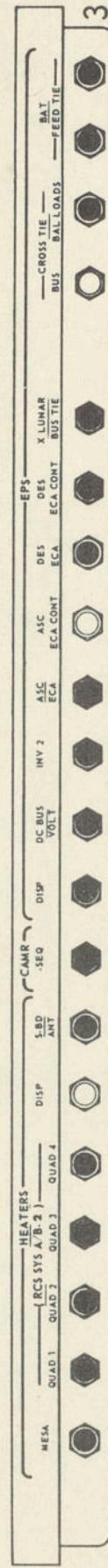
OPEN



PREAMPS & CES



OPEN



OPEN

1-4

DATE 5/10/71

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 <u>37</u> , B <u>37</u> (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 DN Charts

1-6

DATE 6/30/71

DATE 5/10/71

PWR DN & EVA

SE WHO		H/P/GS S-BD		ORDN AL		AC BUS B		AC BUS A		AC BUS A	
HTR		PROPUL SUP		ANT		AOT		AGS		AOT	
						LAMP		LTD		LAMP	
<input checked="" type="checkbox"/>											
<input checked="" type="checkbox"/>											
<input checked="" type="checkbox"/>											

OPEN

URINE LINE		RHIZZ RDR — STBY		HEATERS		ECS		CABIN FAN		UP DATA		SEC S/B		COMA		PCBS	
QUAD 4		QUAD 3		QUAD 1		LOG RDR		DOCK WINDO W		ATT DIR (PGHS)		ENG CONT		DECA PWR		LGC/DSRY	
<input checked="" type="checkbox"/>																	
<input checked="" type="checkbox"/>																	
<input checked="" type="checkbox"/>																	

ALL OPEN

HEATERS RCS STS A/B-1		QUAD 1		INST		STAB/CONT		ED		LOGIC		LTG		PCBS	
QUAD 4		QUAD 3		QUAD 1		AOT		ATC/A		ATT DIR		ENG START		DECA	
				C/DR		AEI		CONT		CONT		OVER		PWR	
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															

15 OPEN

CROSS TIE		BAL LOADS		X LUNAR		DES		ASC		INV 1		DC BUS		PCBS	
FEED TIE		BAT		BUS TIE		ECA		ECA CONT		ECA		VOLT		PCBS	
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															

6 OPEN

PROPELL		DE/H		REG/VENT		3		3		3		3		3	
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															
<input checked="" type="checkbox"/>															

OPEN

EVA 1 POST

EVA 2 POST

EVA 1 PREP

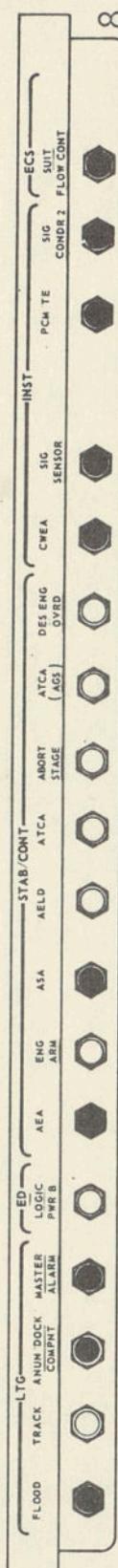
1-7

PWR DN & EVA

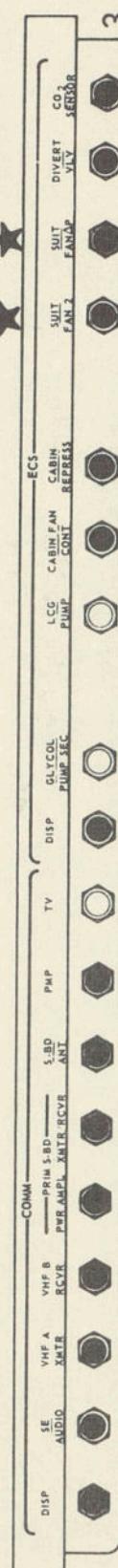
16



OPEN

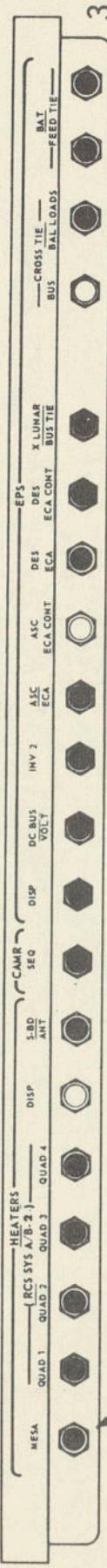


OPEN



OPEN

CLOSE PRIOR TO EGRESS → OPEN PRIORITY DEPRESS →



OPEN

OPEN FOR EVA 3

★ — OPEN FOR EVA

1-8

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

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
HELIMON - PRESS 1

RR GYRO SEL - PRIM

EVA 1 PREP
EVA 2 POST

SEVA

EVA 1 POST

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 STOP - Reset
AGS STATUS - STBY

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

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

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

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

VHF A XMTR - OFF
VHF A RCVR - ON
VHF B XMTR & RCVR (2) - OFF

BIOMED - LEFT
TLM - HI
RECORDED - OFF

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

TTCA (LMP) - JETS (Dn)

1-10

DATE 6/30/71

DATE 7/14/71

VHF - AFT
TRACK MODE - SLEW
S BAND - SLEW

Copy Liftoff Time In Data Book
For Rev 16 thru 20

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

PRESS REG A&B - CABIN
CABIN REPRESS - AUTO
LO PLSS FILL - CLOSE
DES 02 - OPEN
#1, #2 ASC 02 - 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 02 FIL - CLOSE

CABIN RELIEF & DUMP (2) - AUTO & Locked

CWEA STATUS: CAUTION: PREAMPS

1-11

EVA 2 POST EVA 1 PREP SEVA

EVA 1 POST

FIRST REV ACT

DATE 6/30/71

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 Side 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

2-1

EVA 1 PREP
EVA 2 POST

SEVA

EVA 1 POST

Audio (CDR & LMP):
MODE - VOX
VOX SENS - As Req'd

Comm Check With Each Other And Hou

HELMET/GLOVE DONNING

LM 02 Hoses, R/R & B/B
Position Mikes (Both)
Don Helmets
Don LEVA's

Verify The Following:
Helmet & Visor (1) - Aligned &
Adjusted
02 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 02
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)

2-2

DATE 5/10/71

DATE 6/30/71

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

2-3

CDR Stand On Eng Cover

SEVA

Identify Landmarks For LM Location
At 3.5 Psia
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

EVA 1 PREP

EVA 2 PREP

EVA 2 POST

EVA 1 POST

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 02 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

2-4

DATE 6/30/71

DATE 7/14/71

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, LHSSC)
Don CWG Adapter & Headset
Connect Bio Belt (Only CDR Data Req'd)
& Headset To Adapter

Connect LM Comm
Audio CB - CLOSE
Verify Comm

LMP Repeat DOFF SUITS * * *
TLM BIOMED - LEFT

2-5

EVA 2 POST

EVA 1 PREP

EVA 2 PREP

EVA 1 POST

LM CONSUMABLES UPDATE

GET	<u>107:11</u>	CDT	<u>1945</u>	
RCS A	% (75)	<u>85.0</u>	B	(75) <u>85.5</u>
02 DES	1% (83.4)	<u>85</u>	2	(83.4) <u>83.5</u>
02 ASC	1% (97.5)	<u>99</u>	2	(97.5) <u>99</u>
H2O DES	1% (84.0)	<u>79</u>	DES 2 (84.0)	<u>80</u>
H2O ASC	1% (100.0)	<u>100</u>	ASC 2 (100.0)	<u>100</u>
AMP-HR DES	(1709)	<u>1705</u>	ASC (568)	<u>572</u>

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

2-6

DATE 7/19/71
7/14/71

Configure ECS For Sleep

Stow LM O₂ 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 6/30/77
7/22/77

PLSS H20 CHARGE

CAUTION: DO NOT USE PLSS DECAL

- * * * * CDR 1st: * * * *
- PLSS AUX H20 - OPEN
- Connect WMS To PLSS H20 DRAIN
- LM DES H20 - CLOSE
- Connect LM H20 To PLSS H20 FILL
- LM DES H20 - OPEN ~~\$~~ Minutes
- LM DES H20 - CLOSE ~~5~~
- Connect WMS To PLSS PRIM Vent
- LM DES H20 - OPEN
- Monitor PRIM Sight Glass,
- Verify Gas Expelled - 25 Sec Max
- LM DES H20 - CLOSE
- Connect WMS To PLSS AUX Vent
- LM DES H20 - OPEN
- Monitor AUX Sight Glass,
- Verify Gas Expelled - 20 Sec Max
- LM DES H20 - CLOSE
- Disconnect And Stow WMS Hose
- LM DES H20 - OPEN 5 Sec,
- PLSS AUX H20 - CLOSE
- Disconnect And Stow LM H20 Hose

Stow PLSS Connector Covers
Set LMP PLSS On Mid-Step
LMP Repeat H20 CHARGE * * *

- LM DES H20 - 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 00 ✓
- (Aft RHSSC) In ETB ✓
- Stow 3-16mm Mags CC, DD, EE (RHSSC) In ETB ✓

2-7

EVA 1 PREP

EVA 2 PREP

EVA 1 POST

| Stow EVA 1 Maps, 1:25,000 EVA 2 Map, ✓ Unstow CDR's Hammock, Place On Suits
| Horizon/Return Chart, Rover Schematic, ✓ Unroll LMP's Hammock
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 Arrests, 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 H2O Charge

2-8

DATE 7/14/71

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
Adjust Strap Tension

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 7/14/77
7/19/77

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

2-8
CDR
LMP

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	<u>116:40</u>	CDT	<u>0514</u>	<u>116:40</u>
RCS A	%	(75)	<u>85</u>	<u>B</u>
02	DES	1% (86.8)	<u>78.5</u>	<u>2</u>
02	ASC	1% (97.0)	<u>99.0</u>	<u>02</u>
H2O	DES	1% ((70.5)	<u>58</u>	DES 2(70.5)
H2O	ASC	1% (100.0)	<u>100</u>	ASC 2(100.0)
AMP-HR	DES	(150)	<u>1538</u>	ASC (568)

EVA 1 PLANNING WITH HOU (10 MIN)

Update EVA 1 Cuff Checklist As Rreqd

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

2-9

EVA 2 POST

EVA 1 PREP

EVA 2 PREP

EVA 1 POST

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 H2O To PGA If
192 PKG Lanyard Seated

SUIT ISOL - SUIT DISC
Connect LM 02 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-BD VOICE - VOICE

2-10

DATE 6/30/71

DATE 6/30/71

118:05 BATT MGMT

(0639) POWER/TEMP MON - ED/OFF
Check ED Volts, A BAT, 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

2-11

EVA 2 POST

EVA 1 PREP

EVA 2 PREP

EVA 1 POST

FIRST REV ACT

SEVA

DATE 5/10/71

118:05 CABIN PREP EVA 1
(0639)

Stow All Loose Items Not Req'd For EVA

Unstow EVA 1 Prep & Post Card

118:20 Stow Lunar Surface Checklist

3-1

EVA 2 POST

EVA 1 PREP

EVA 2 PREP

EVA 1 POST

COLLECTION WEIGHT SUMMARY (#)

	EVA 1	EVA 2	EVA 3
SRC	<u>36</u>	<u>40</u>	<u>25</u>
Bag	<u>4</u>	<u>3</u>	<u>7</u>
Bag	<u>15</u>	<u>30</u>	<u>24</u>
Bag	<u> </u>	<u>6</u>	<u>7</u>
TOTAL	<u>51</u>	<u>103</u>	<u>72</u>

COLLECTION BAG STOWAGE

- 1 - Aft Eng Cover (40#Max): Bag 3
 1 - LHMS (40#Max): Bag 2
 2 - LH + RHSSC (40#Max): Bags 1, 6,

$$\frac{3}{15} \quad \frac{1}{48} \quad \frac{1}{16} \quad \frac{3}{64}$$

8 Return temps
72
103
51
226

Covers of
Bags of 100's

3-2

DATE 6/30/71

3-3

DATE
5/10/71TRANSITION TO ONE-MAN EVA

BOTH Verify/Perform-As Rqd 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 Rqd
 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 Rqd

OTHER CREWMAN (As Rqd):

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

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 02 - OFF
 Disconnect Purge Vlv, Stow In Purse
 Disconnect OPS 02 Hose

Connect to LM ECS Hoses, R/R, B/B
 SUIT ISOL - SUIT FLOW
 PLSS FAN - OFF (Left)
 PLSS 02 - 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 02 Actuator
 Disconnect RCU From PGA, Then PLSS
 Stow RCU On Eng Cover

Disconnect PLSS H2O From PGA
 Disconnect PLSS Red O2 Hose, Then Blue
 Off PLSS/OPS, Place on Floor
 Stow OPS 02 Hoses & Actuator

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

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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

3-5

EVA 2 POST

EVA 3 POST

EVA 2 PREP

EVA 1 POST

PLSS DUNNING

* * * * LMP 1st: * * * *
Set PLSS On Mid-Step
Verify OPS Reg Decay
Unstow 02 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 H20, DIVERTER, 02, &
PRIM H20-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 02 Hoses To PGA
Verify AUX H20, DIVERTER, 02, &
PRIM H20-OFF

Secure Flaps

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

Unstow OPS 02 Hose & Actuator, Route Hose
Behind PGA
Connect Actuator To RCU

CDR Repeat PLSS DUNNING * * *

PLSS COMM CHECK

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

3-6

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Audio (LMP)
S-BAND - T/R
ICS - T/R
RELAY - ON
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 - 0, 02 Mom)
PLSS 02 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 - 0, 02 Mom)
PLSS 02 Press Gage > 85%

3-7

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
RECODER - 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

EVA 2 POST

EVA 3 POST

EVA 2 PREP

EVA 1 POST

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 02 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 Rqd
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)

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OPS CONNECT

LMP 1st: # # #
SUIT ISOL - SUIT DISC
Discon LM 02 Hoses, Secure About PGA

Connect OPS 02 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
02 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 Bitting, PLSS 02 - ON/OFF

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

3-9

PRESS REG A & B - EGRESS

EVA 2 POST

EVA 3 POST

EVA 2 PREP

EVA 1 POST

EVA PREP

(MIN TIME)

PRESSURE INTEGRITY CHECK

PLSS 02 - ON (Tone-On, 02 Flag-0)
Press Flag Clear (3.1-3.4 Psig)
Cuff Gage 3.7-4.0 Psig
02 Flag Clear

PLSS 02 - OFF (Monitor Cuff Gage For
1 Min, Report Decay)
PLSS 02 - ON (Cuff Gage 3.7-4.0
Psig, Tone & 02 Flag May Come On)
Verify 02 Flag Clear

CABIN DEPRESS

Confirm Go For Depress From Hou
CB(16)ECS: CABIN REPRESS - Open
CB(16) Comm: TV - Close
CABIN REPRESS V1V - CLOSE

Ovhd Or Fwd Dump V1V - 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

3-10

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

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POST EVA 1

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

NOTE: PLSS 02 & PRESS Flags May Come
On During Repress. If PLSS 02 <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 02 - OFF @ Cabin > 2.5 Psi a

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psi a
Use Purge Valve To Depress PGA As Req'd

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 V1v - OPEN
Remove Purge Valve, Stow In Purse
Disconnect OPS 02 Hose

Connect LM 02 Hoses R/B & B/R
PGA Diverter V1v - Horizontal

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

Disconnect PLSS H2O From PGA
Connect LM H2O

5-1

EVA 3 POST

EVA 2 PREP

EVA 1 POST

(MIN TIME)

EVA 1 PREP

SEVA

EVA 1 POST

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

PLSS Mode - AR (02 QTY ~85%)
 PLSS Mode - 0

Disconnect LM 02

CDR Repeat 02 RECHARGE * * *

Stow LM 02 Supply Hose

PLSS/OPS DOFFING

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

PLSS 02 RECHARGE

Verify DES 2 02 >56%

* * * * LMP 1st: * * * * *
 Connect LM 02 To PLSS
 HI PLSS 02 FILL - OPEN Then CLOSE
 After 4 Min

Disconnect OPS Actuator From RCU
 Disconnect RCU From PGA
 PLSS PUMP, FAN-OFF (LEFT) MODE SEL - 0
 Disconnect RCU From PLSS, Stow In
 LCG Bag (LHMS)

Disconnect PLSS 02 Hoses
 Doff PLSS/OPS (LMP 1st)
 Stow LMP PLSS On Floor
 Stow CDR PLSS On Mid-Step
 Stow OPS 02 Hose & Actuator
 Disconnect OPS Antenna Lead

5-2

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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 02 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 VIV
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

5-3

EVA 2 POST

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

(MIN TIME)

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

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

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 ✓

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 02, 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)

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

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DRY PGA
Connect LM 02 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

TLM BIOMED - RIGHT

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

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

PLSS 02 & H2O RECHARGE (30 MIN)

Verify 1 Hr Elapsed Since Initial
02 Recharge (DES 2 02 >56%)

Fold LMP's PGA Legs Over PGA Back

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

* * * * CDR 1st: * * * * *
Connect LM 02 To PLSS
HI PLSS 02 FILL - OPEN Then CLOSE
After 10 min

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

Connect LM Comm
Audio CB - CLOSE
Verify Comm

LMP Repeat DOFF SUITS * * * *

5-5

EVA 2 POST

EVA 2 PREP

EVA 3 PREP

(MIN TIME)

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 ~~X5~~ 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 02 FILL - CLOSED
 Disconnect And Stow LM 02 Supply Hose
 Stow PLSS Connector Covers
 Set LMP PLSS On Mid-step
 LMP Repeat 02 & 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 Req'd
 Stow Return Items In Purse

5-6

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M

STOW IN ETB:

- 1-70mm Camr (LMP's) With HCEX Mag KK (ETB)
- 1-70mm Camr (CDR's) With B&W Mag 00 (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

Configure ECS For Sleep
Stow LM O₂ 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)

EVA DEBRIEFING WITH HOU (15 MIN)

Report Status Of PLSS Recharge

CREW STATUS REPORT

LMP 8023

CDR 25019

PRD 4

EAT PERIOD

129:05 TO 129:50
1739 TO 1824

Copy Liftoff Time In Data Book
For Rev 28-31

16 mn 00
70 mn 00

Unroll CDR's Hammock With Sleep
Restraint

Unroll LMP's Hammock With Sleep
Restraint

5-7

EVA 2 POST

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

(MIN TIME)

EVA 1 PREP

SEVA

EVA 1 POST

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
 $\frac{130:05}{1839}$ TO $\frac{137:55}{0229}$

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

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7/19/71

LM CONSUMABLES UPDATE

GET 138:00 CDT 0234

RCS A	% (75)	<u>85</u>	B	(75)	<u>85</u>
02 DES	1% (77.4)	<u>71.5</u>	2	(74.5)	<u>68.4</u>
02 ASC	1% (97.0)	<u>99.0</u>	2	(97.0)	<u>99.0</u>
H2O DES	1% (47.5)	<u>42.3</u>	DES 2(47.5)	<u>40.2</u>	
H2O ASC	1% (100.0)	<u>100.0</u>	ASC 2(100.0)	<u>100.0</u>	

AMP-HR DES 1066 1157 ASC 568 572

EVA 2 PLANNING WITH HOU (10 MIN)

■ Update EVA 2 & 3 Cuff Checklist
As Rreqd (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, Wriststring &
Gas Connectors
Lub Zippers With Pad

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

DOFF ICG
Stow ICG In Top Boot Comp

5-9

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

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

CDR Repeat DON SUITS * * * *

TLM BIOMED - LEFT
S-BD VOICE VOICE

■ 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 02 R/B & B/R, H2O & Comm
SUIT ISOL - SUIT FLOW
SUIT GAS DIVERTER - PULL - EGRESS
CABIN GAS RETURN - EGRESS
AUDIO CB - CLOSE
Verify Comm

5-10

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139:40 CABIN PREP EVA 2
(0414)

Stow All Loose Items Not Req'd For EVA

Unstow EVA 2 Prep & Post Card

139:55 Stow Lunar Surface Checklist

6-1

EVA 2 POST

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

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 Anti fog (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 BSLS 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 OPS Antenna Lead To PLSS
 Verify Sublimator Exhausts Clear
 Unstow PLSS Straps & Hoses
 Remove Elect Dust Cap, Stow In Purse
 Verify AUX H20, DIVERTER, 02, &
 PRIM H20 - 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 02 Hoses To PGA
 Verify AUX H20, DIVERTER, 02, &
 PRIM H20 - OFF

6-2

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Connect RCU To PGA & Upper Straps

Verify RCU Controls:

PUMP, FAN - OFF (Left) MODE SEL-0

Connect RCU To PLSS

Unstow OPS 02 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

6-3

EVA 2 POST

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

EVA 3 PREP

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

NOTE: Crewman In Mode B Cannot
Hear Hou

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 - 0, 02 Mom)
PLSS 02 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 - 0, 02 Mom)
PLSS 02 Press Gage > 85%

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 02 Qty to Hou

FINAL SYSTEMS PREP

CB(16) ECS: LCG PUMP - Close
LCG - Cold, As Rqrd
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)

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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 02 Hoses, Secure About PGA

Connect OPS 02 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 Rreqd
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

02 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)

6-5

EVA 2 POST

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

EVA 3 PREP

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

NOTE: If PGA Bitting, PLSS 02 - ON/OFF

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

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK

PLSS 02 - ON (Tone-On, 02 Flag-0)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
02 Flag Clear

PLSS 02 - OFF (Monitor Cuff Gage For
1 Min, Report Decay)
PLSS 02 - ON (Cuff Gage 3.7-4.0
Psig, Tone & 02 Flag May Come On)
Verify 02 Flag Clear

CABIN DEPRESS

Confirm Go For Depress From Hou
CB(16)ECS: CABIN REPRESS - Open
CABIN REPRESS V1v - CLOSE

Ovhd Or Fwd Dump V1v - 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 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

6-7

EVA 2 POST

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

EVA 3 PREP

EVA 1 PREP

EVA 2 PREP

EVA 1 POST

DATE 6/30/71

POST EVA 2

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

NOTE: PLSS 02 & PRESS Flags May Come
On During Repress. If PLSS 02 <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 02 - 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 Req'd

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 02 Hose

Connect LM 02 Hoses R/B & B/R
PGA Diventer Vlv - Horizontal

SUIT ISOL (Both) - SUIT FLOW
PLSS PUMP - OFF (Left)
PLSS FAN - OFF (Left)
Disconnect PLSS H2O From PGA
Connect LM H2O

8-1

EVA 2 POST

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

EVA 3 PREP

EVA 2 POST

EVA 1 PREP

EVA 2 PREP

EVA 1 POST

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
VHF ANTENNA - AFT
UPLINK SQUELCH-OFF

PLSS 02 RECHARGE

Verify DES 2 02 >56%

* * * * LMP 1st: * * * *
Connect LM 02 To PLSS
HI PLSS 02 FILL - OPEN Then CLOSE
After 4 Min

8-2

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PLSS Mode - AR (02 QTY ~85%)
PLSS Mode - 0

Disconnect LM 02

CDR Repeat 02 RECHARGE * * *

Stow LM 02 Supply Hose

PLSS/OPS DOFFING

Disconnect OPS Actuator From RCU
Disconnect RCU From PGA
PLSS PUMP, FAN-OFF (LEFT) MODE SEL - 0
Disconnect RCU From PLSS, Stow In
LCG Bag (LHMS)

Disconnect PLSS 02 Hoses
Doff PLSS/OPS (LMP 1st)
Stow LMP PLSS On Floor
Stow CDR PLSS On Mid-Step
Stow OPS 02 Hose & Actuator
Disconnect OPS Antenna Lead

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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 02 Press 5380 - 6380
Stow CDR OPS On Floor Under Purse
Stow CDR PLSS In Recharge Station

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

8-3

Stow LMP OPS On Floor Under Dump V1v
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

EVA 3 POST

LAUNCH PREP

ONE-MAN EVA 1
(MIN TIME)

EVA 3 PREP

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 - ~~DN~~ 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 02, H20 & 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)

DATE 6/30/71

DRY PGA
Connect LM 02 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 Req)
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
XMT - OFF After Conversation

8-5

LAUNCH PREP

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

EVA 3 PREP

PLSS 02 & H2O RECHARGE (30 MIN)

Verify 1 Hr Elapsed Since Initial
02 Recharge (DES 2 02 >56%)

Fold LMP's PGA Legs Over PGA Back

* * * * CDR 1st: * * * *

Connect LM 02 To PLSS

HI PLSS 02 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 ~~15~~ 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 02 FILL - CLOSED
Disconnect And Stow LM 02 Supply Hose
Stow PLSS Connector Covers
Set LMP PLSS On Mid-step

LMP Repeat 02 & H2O RECHARGE * * * *

LM DES H2O - OPEN

Set LMP PLSS Against Hatch
HTR CONT: URINE LINE - OFF
CB(11) HTR: URINE LINE - Open

8-6

DATE 7/22/71
6/30/71

DATE 7/14/71

Empty ETB As Follows:

Stow 3-B&W Mags PP, QQ, RR In LCG Compt
Stow 1-B&W Mag 00 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 Req'd
Stow Return Items In Purse

CREW STATUS REPORT

CDR	LMP
MED	_____
PRD	_____

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

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

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) ~~KK~~

1-B&W Mag ~~WW~~ (ETB)

2-16mm Mags. II, JJ (LCG Compt), G, H
EVA 3 Maps

EVA DEBRIEFING WITH HOU (15 MIN)

Report Status Of PLSS Recharge

Copy Liftoff Time In Data Book
For Rev 38-41

Configure ECS For Sleep
Stow LM O₂ 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

8-7

LAUNCH PREP

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

EVA 3 PREP

EVA 2 POST

EVA 1 PREP

EVA 2 PREP

EVA 1 POST

Stow Food As Req'd
Remove Fwd End Of ISS

Unroll CDR's Hammock With Sleep
Restraint

Unroll LMP's Hammock With Sleep
Restraint

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

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

STAY/NO STAY FOR EVA 3 PREP

CREW STATUS REPORT
CDR _____
LMP _____

MED _____
PRD _____

8-8

DATE 6/30/71

DATE 6/30/71
7/19/71

Copy Liftoff Time In Data
Book For Rev 42-47

LM CONSUMABLES UPDATE

GET 158:40 CDT 2314

RCS A %	(75)	<u>85.0</u>	B	(75)	<u>85.0</u>
02 DES 1%	(66.3)	<u>59.9</u>	2	(63.4)	<u>56.7</u>
02 ASC 1%	(96.5)	<u>99</u>	2	(96.5)	<u>99</u>
H2O DES 1%	(25.0)	<u>18.3</u>	DES 2(25.0)	<u>16.5</u>	
H2O ASC 1%	(100.0)	<u>100</u>	ASC 2(100.0)	<u>100.0</u>	
AMP-HR DES	(687)	<u>803</u>	ASC (568)	<u>572</u>	

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

TPK

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 Jet Bag

8-9

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

LAUNCH PREP

EVA 3 PREP

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 02 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-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

8-10

DATE 6/30/71

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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

9-1

LAUNCH PREP

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

EVA 3 PREP

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 Anti-fog (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 02 Nozzle & Antenna Lead
Secure Flaps

- Attach OPS To PLSS
- Connect Antenna Lead To PLSS
- Verify Sublimator Exhausts Clear
- Unstow PLSS Straps & Hoses
- Remove Eject Dust Cap, Stow In Purse
- Verify AUX H2O, DIVERTER, 02 & 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 02 Hoses To PGA
Verify AUX H20, DIVERTER, 02 &
PRIM H20 - OFF

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

Unstow OPS 02 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

REORDER - 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

COMM:

VHF A XMTR - VOICE
A RCVR - ON
B XMTR - OFF
B RCVR - ON
B RCVR - OFF
PCM - LO
SQUELCH VHF A&B -
Noise Thres + 1 1/2

Noise Thres + 1 1/2

REORDER - ON

VHF Antenna - EVA

UPLINK SQUELCH - ENABLE

9-3

LAUNCH PREP

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

EVA 2 POST

EVA 1 PREP

EVA 2 PREP

EVA 3 PREP

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-0, 02 Mom)
PLSS 02 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-0, 02 Mom)
PLSS 02 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-0n)
PLSS Mode(CDR)-A, Wheel-CCW(Tone-0n)
CDR Comm Check With LMP And HOU
PLSS Mode (Both) - AR (Tone-0n)
NOTE: (AR) Wheel-Hou, Blade-EVA
Perform Comm & TM Check With Hou &
Comm Check With Each Other
Read PLSS 02 Qty To Hou

FINAL SYSTEMS PREP

CB(16) ECS: LCG PUMP - Close
LCG - Cold, As Rreqd
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)

9-4

DATE 5/10/71

DATE 6/30/71

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 02 Hoses, Secure About PGA
Connect OPS 02 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 Req'd
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)

9-5

EVA 3 POST

LAUNCH PREP

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

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

NOTE: If PGA Bitting, PLSS 02 - ON/OFF

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

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK

PLSS 02 - ON (Tone-On, 02 Flag - 0)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
02 Flag Clear

PLSS 02 - OFF (Monitor Cuff Gage For
1 Min, Report Decay)
PLSS 02 - ON (Cuff Gage 3.7-4.0
Psig, Tone & 02 Flag May Come On)
Verify 02 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 Psi (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

9-7

LAUNCH PREP

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

EVA 2 POST

EVA 1 PREP

EVA 2 PREP

EVA 3 PREP

DATE 6/30/71

POST EVA 3

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

NOTE: PLSS 02 & PRESS Flags May Come
On During Repress. If PLSS 02 <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 02 - OFF @ Cabin > 2.5 Psi^a

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psi^a
Use Purge Valve To Depress PGA As Req'd

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 02 Hose

Connect LM 02 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

11-1

EVA 3 POST

LAUNCH PREP

ONE MAN
EVA PREP
ONE-MAN EVA 1
(MIN TIME)

EVA 2 POST

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

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

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

Disconnect PLSS 02 Hoses
Doff PLSS/OPS (LMP 1st)
Stow LMP PLSS On Floor
Stow CDR PLSS On Mid-Step
Stow OPS 02 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 ***

11-2

DATE 6/30/71

DATE 6/30/71
7/19/71

Verify Powerdown CB Configuration

(White Dots Out)

CB(11) HEATERS: RR OPR - Close

RR STBY - Open
← β_{C11}) β_{TR5} : $\beta_{07- close}$

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 BSLS/ 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 02 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

11-3

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

Clean & Lub Wriststrings As Rqd
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 02
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)

LAUNCH PREP

ONE-MAN EVA 1
(MIN TIME)

EVA-1 TWO MAN
WALKING TRAVERSE

ONE MAN
EVA PREP

EVA 2 POST

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

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)

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 02 Hoses, R/B & B/R

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

11-4

DATE 5/10/71

DATE 6/30/71
7/19/71

LAUNCH PREP

Unstow Lunar Surface Checklist 12-
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 FDAO (AC/DC) - Close (2)
UPDATA LINK - Close
V16 N65E
MISSION TIMER - Set

V25 N01E, 1365E
E,E,E
V15 N01E, 1365E
(A11 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)

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

POWER/TEMP MON - ED/OFF
Check ED VOLTS, A BAT, 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)
____ : ____ : ____ .

12-1

LAUNCH PREP

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

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

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Window Shades - Close
CB(11) AOT LAMP-Close
P57E, R2 00004, PRO
N34 (Load LO Time), PRO

N06 00010

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Window Shades - Close
CB(11) AOT LAMP-Close
P57E, R2 00004, PRO
N34 (Load LO Time), PRO

N06 00010

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Window Shades - Close
CB(11) AOT LAMP-Close
P57E, R2 00004, PRO
N34 (Load LO Time), PRO

N06 00010

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Window Shades - Close
CB(11) AOT LAMP-Close
P57E, R2 00004, PRO
N34 (Load LO Time), PRO

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Window Shades - Close
CB(11) AOT LAMP-Close
P57E, R2 00004, PRO
N34 (Load LO Time), PRO

N06 00010

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Window Shades - Close
CB(11) AOT LAMP-Close
P57E, R2 00004, PRO
N34 (Load LO Time), PRO

N06 00010

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Window Shades - Close
CB(11) AOT LAMP-Close
P57E, R2 00004, PRO
N34 (Load LO Time), PRO

N06 00010

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Window Shades - Close
CB(11) AOT LAMP-Close
P57E, R2 00004, PRO
N34 (Load LO Time), PRO

N06 00010

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DATE 7/14/77
7/19/77

POST EVA CABIN CLEANUP

CB(+1) HTRS: AOT Close

- ✓ Secure OPS (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
 - ✓ 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 Req'd
- ✓ Solar Wind In ISA Bot Pkt

12-3

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

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

RR MODE - LGC (Wait 10 sec Before V37E)
RATE/ERR MON (CDR) - RNDZ RDR

V95E

P22E

N06 R2 00001
PRO (N54 R, R; If R>400 & R<0)
DSKY Blanks; V83E, N54, PRO By 130 nmi
V16 N72E (+19000, +33000)
NO TRACK Lt-Off at ~103nmi
(N78E, Rng, Rng Rt)
NO TRACK Lt-On At ~80nmi
(N72 Goes To +18000, +27000)
P00E

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

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

CREW STATUS REPORT	
CDR	LMP
MED	_____

12-4

EAT PERIOD
169:37 TO 170:22

Copy Ascent Pads
CSI Pad
LM DAP Wt

DATE 6/30/71

DATE 6/30/71

L0-1:15 (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

12-5

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

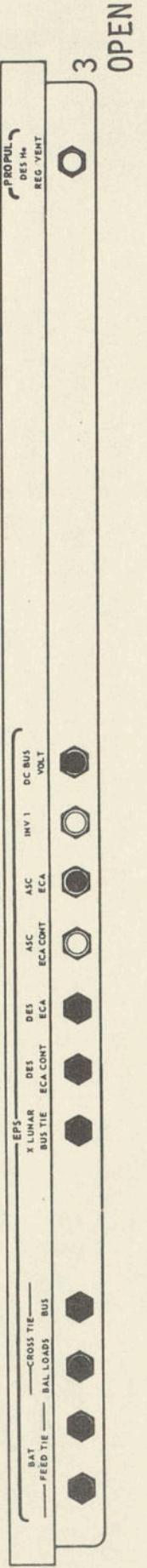
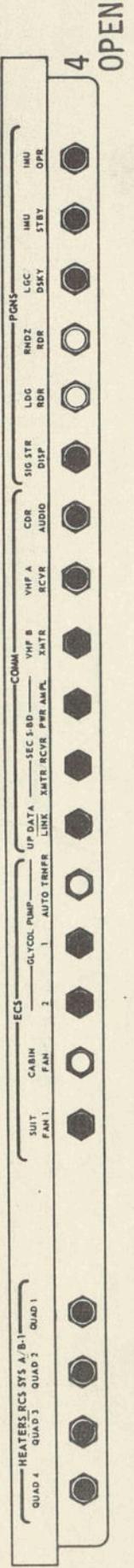
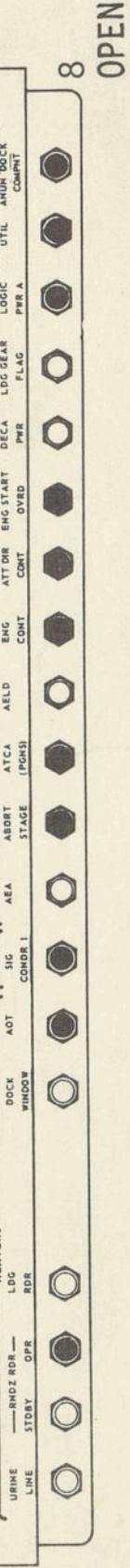
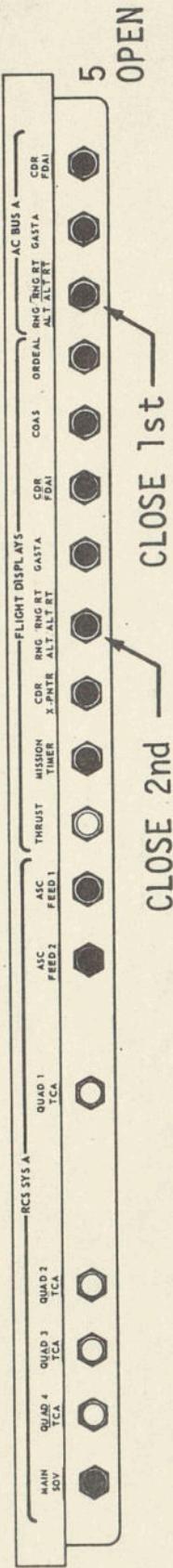
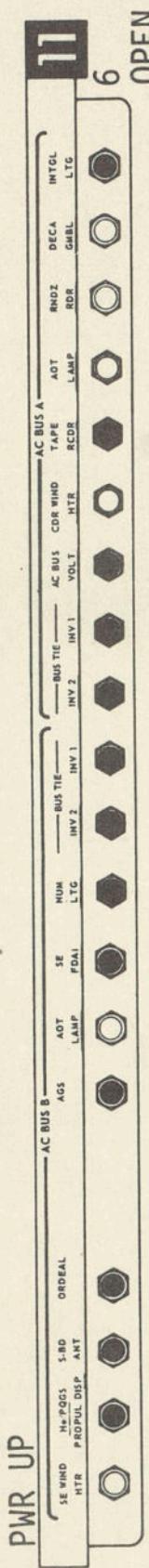
ONE MAN
EVA PREP

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

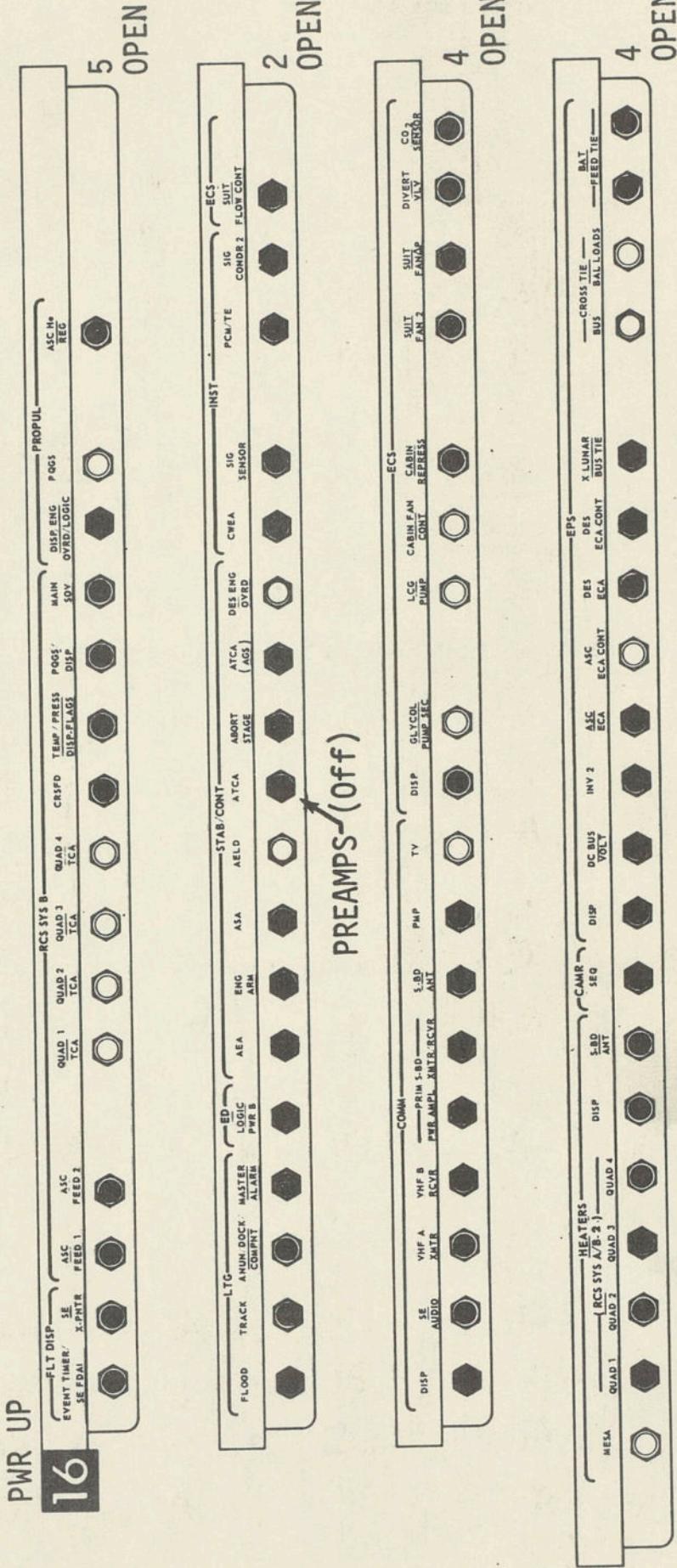
EVA 3 PREP



12-6

DATE 5/10/71

DATE 5/10/71



12-7

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

**ONE-MAN EVA 1
(MIN TIME)**

ONE MAN
EVA PREP

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

Omit Self Test If P22 Performed
 CB(11) RR (2) - Close (NO TRACK Lt-On)
 X-PIINTER 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 -
~~1.9~~
~~3.5~~
~~2.4-.6~~
~~2.4-.6~~
 AGC - XMTR PWR 1.4 To 1.9
 - SHAFT ERR 3.3 To 3.8
 - TRUN ERR 2.2 To 2.6
 - AGC 2.2 To 2.6

400 + 4 Lunar Align (Wait 30 sec
 Before 400 + 6)

544R	+000 14	X Gyro Coeff (.01°/hr)
545R	+000 01	Y Gyro Coeff
546R	-000 00	Z Gyro Coeff

V25 NOTE (Set NORRMON Fig)
 10E, 10E, 1E
 RR MODE - LGC (NO TRACK Lt - On)

12-8

DATE 6/30/71

DATE 6/30/71

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 aL (+58566)
✓ 231 RLS (+56907)
232 INS ALT (+00600)
410 +0 ORB INS
465 INS HDOT (+00320)
547 +0 LUNAR ALIGN CORRECTION
662R + 0 (4K10)
673R + 0

514 R ~~514~~ (-53334)
515 R ~~515~~ (-47371)
516 R ~~516~~ (+00000)

307 ΔT TRANS (+04300)
373 ΔWY TIG TPI (+01496)
451+0

400R (+0 Calib Complete)

544R ~~+000~~ / ~~2~~ X (.01°/hr)
545R ~~+000~~ ~~78~~ Y
546R ~~-000~~ ~~2~~ Z

If Gyro Coeff Changes More
Than 2.0°/hr, AGS Failed

12-9

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

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 _____

P $\frac{Y}{\overline{\text{TRACK}}}$, $\frac{Y}{\overline{\text{MODE}}}$ - (+77 / -66)
AUTO

S-BAND RANGE - CWEA ENABLE

V48, 12102, PRO, +10873 LM, PRO
V77 E

V15NOTE, 42E(Rate Cmd Hot Fire Check

CB(11 & 16) QUAD TCA (8)-Close
CDR ACA (Out-Of-Detent, Pause 2 sec At
Null)
Ro11 Rt R3 000XXX

Lt 777XXX
Pitch Up R1 000XXX

Dn 777XXX
Yaw Rt R2 777XXX

Lt 000XXX
CB(11&16) QUAD TCA (8)-Open

V76E (Min Imp Check of CDR ACA To
LGC, ACA Cold Fire CES Voltage,
SEC RCS ~~at~~ Hot Fire 4-JET In
AGS)
Coi DATE 7/15/71

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 _____

P $\frac{Y}{\overline{\text{TRACK}}}$, $\frac{Y}{\overline{\text{MODE}}}$ - (+77 / -66)
AUTO

S-BAND RANGE - CWEA ENABLE

Copy Updated AGS K Factor

170 : 00 : 00 80

DATE 5/10/71

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 27757 (QUAD Flag & RCS
Lt 27737 TCA Warn Lt-On)
Pitch Up 27776
Dn 27775
Yaw Rt 27767
Lt 27773
GUID CONT - PGNS
MODE CONT (AGS) - AUTO

Cycle CB(16) CWEA

10-:45 (170:52) *****

Window Shades - Close
CB(11) AOT LAMP - Close
P57E, R2 00004, 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)

12-11

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

5 (3)

N04 Grav. Err. (.01°)
 PRO
 N22 ICDU Angles (.01°)
 PRO (NO ATT Lt - On/Off)
 N71 Star, 4 Marks, 303 Navi
 184
 282

200 (46 Hamal)
N88 X +.78378
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
 + .21
 - .12

V40N20E
 400+3 AGS/PGNS Align
 413+[
 047R ~~+37740~~ Transmit To MSFN
 053R ~~+02000~~ Transmit To MSFN

CB(11) RR(2) - Close
 V41N72E (+17500,+27500) ?
 N12 R2 00002, PRO
 V16N72E
 CB(11) RR (2) - Open
 V44E

RR MODE - SLEW
 BAT 5,6 - ON, tb - gray
 BAT 1,3 - OFF/RESET, tb-bp
 CB(11&16) ASC ECA CONT(2)-Close
 Set Camr For Ascent (LM3/DAC/10/CEX (T2.8,1/500,30)
 Mag (BB), ISA Top Pkt, 12fps, 6 min)
 12-12

DATE 7/15/71

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***** * L0-: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

12-13

EVA-2 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

***** 10-:30 (171:07) *****

400 + 4E Lunar Align

CB(11) QUAD 4,3,2,1 TCA (4) - Close
DES He REG/VENT - Close

AELD - Close

INV 1 - Close

CB(16) QUAD 1,2,3,4 TCA (4) - Close

AELD - Close

MASTER ARM - OFF

STAGE - SAFE/Guarded

X-POINTER SCALE (CDR) - LO MULT

RATE/ERR MON (CDR) - LDG RDR/CMPTR

ATTITUDE MON (CDR) - PGNS

GUID CONT - PGNS

MODE SEL - AGS

RNG/ALT MON - ALT/ALT RT

RATE SCALE - 25°/SEC

ACA PROP (CDR) - ENABLE

ENG ARM - OFF

ATT/TRANSL - 4 JETS

BAL CPL - ON

ABORT - Reset

ABORT STAGE - Reset

12-14

DATE 5/10/71

DATE 5/10/71

PRPLNT TEMP/PRESS MON - ASC
HELUM 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
O2/H2O 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-POINTINTER SCALE (LMP) - LO MULT
ACA/4 JET (2) - ENABLE
TTCA/TRANSL (2) - ENABLE
TTCA (2) - JETS (Dn)
Eng STOP (2) - Reset
12-15

EVA-2 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

Reverse 02 Hoses R/R, B/B
Don Helmets, Gloves (Bot Boot Comp)
& Restraints

DES H₂O - CLOSE
ASC H₂O - OPEN
WATER TANK SEL - ASC
CABIN REPRESS - CLOSE
DES 02 - CLOSE
ASC 02 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

12-16

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

12-17

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE
(MIN TIME)

ONE MAN
EVA PREP

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

LAUNCH

HEATERS		AC BUS B		AC BUS A	
LINE	RNDZ RDR — OPR	LDG	AOT	INV 1	INV 2
MAIN SOV	QUAD 3	QUAD 2	QUAD 1	AC BUS LTC	AC BUS LTC
TCA	TCA	TCA	TCA	SE	SE
				LAMP	LAMP
				FDAI	FDAI
				INV 1	INV 2
				VOLT	VOLT
				CDR WIND	CDR WIND
				HTR	HTR
				RCDR	RCDR
				LAMP	LAMP
				DECA	DECA
				GABL	GABL
				INTOL	INTOL
				LTC	LTC

11

OPEN

HEATERS RCS SYS A		FLIGHT DISPLAYS		AC BUS A	
LINE	RNDZ RDR — OPR	LDG	AOT	INV 1	INV 2
MAIN SOV	QUAD 3	QUAD 2	QUAD 1	AC FEED 1	AC FEED 2
TCA	TCA	TCA	TCA	ASC	ASC
				THRUST	THRUST
				X_FMR	X_FMR
				MISSION TIMER	MISSION TIMER
				CDR	CDR
				RNG RT	RNG RT
				GASTA	GASTA
				CDR FDAI	CDR FDAI
				COAS	COAS
				ORDEAL	ORDEAL
				RNG THG RT	RNG THG RT
				ATT ALRTY	ATT ALRTY

7

OPEN

HEATERS RCS SYS B-1		INST		STAB CONT	
LINE	RNDZ RDR — OPR	LDG	AOT	ENG	ATT DR
QUAD 4	QUAD 3	QUAD 2	QUAD 1	SIG CONDR 1	SIG CONDR 1
				AEA	AEA
				ABORT	ABORT
				STAGE	STAGE
				(PGRHS)	(PGRHS)
				CONT	CONT
				GYRD	GYRD
				PFR	PFR
				PER A	PER A

1

OPEN

HEATERS RCS SYS B-2		UP DATA		CONN	
LINE	RNDZ RDR — OPR	LDG	AOT	SEG SBD	VHF B
QUAD 4	QUAD 3	QUAD 2	QUAD 1	1	1
				AUTO TRNFR	XTR
				LINK	RCVR
				XTR	PER AMPL
				RCVR	RCVR
				SIG STR	SIG STR
				DISP	DISP
				RDR	RDR
				RDY	RDY
				STBY	STBY
				IMU	IMU
				OPEN	OPEN

4

OPEN

BAT		CROSS TIE		PROPOUL	
LINE	RNDZ RDR — OPR	LDG	AOT	DES	DES
				ECA	ECA
				CONT	CONT
				INV 1	DC BUS VOLT
				ECA	ECA
				OPEN	OPEN

4

OPEN

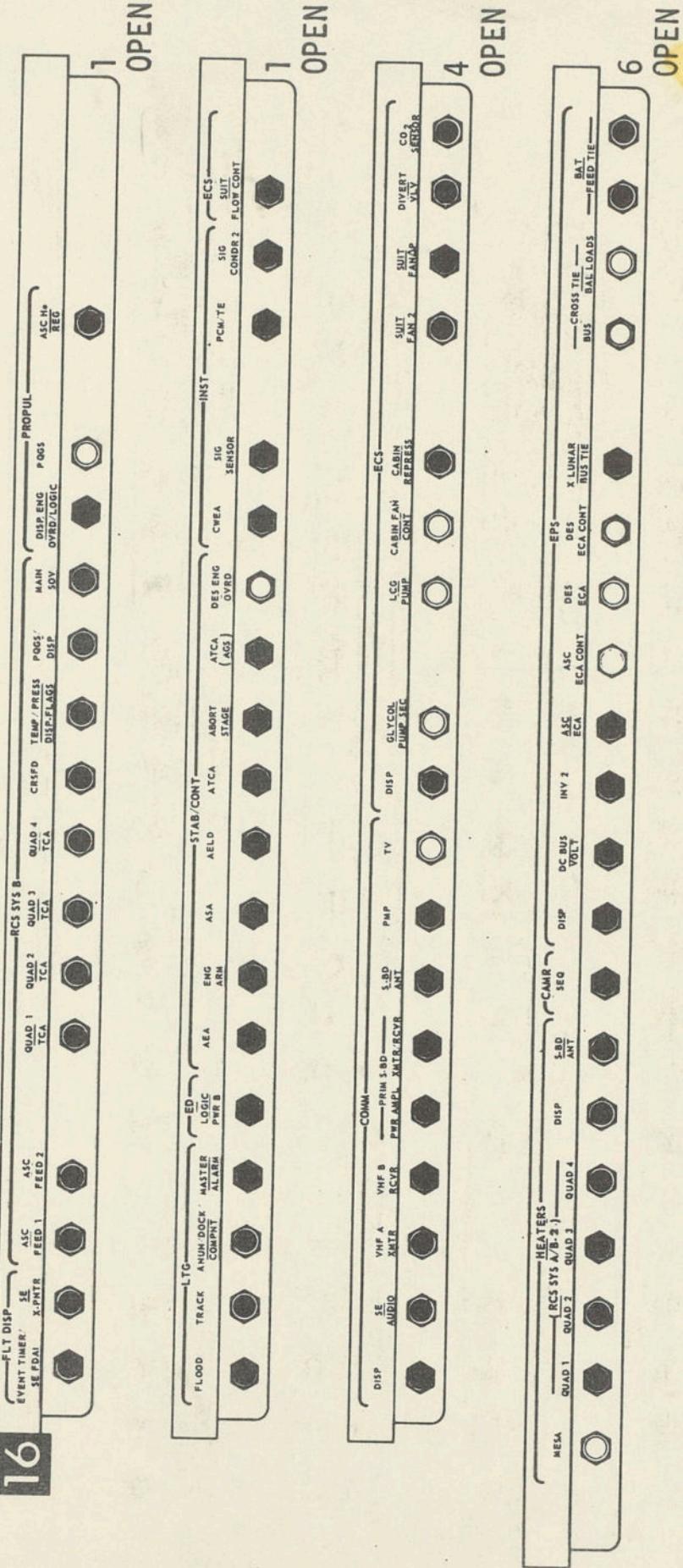
12-18

DATE 5/10/71

DATE 5/10/71

LAUNCH

16



12-19

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

***** L0-:12 (171:25) *****

V83E, 440R ($\Delta R \leq 1.0$ fps)

***** L0-: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
Monitor SYS A Manf Press
SYS A MAIN SOV - CLOSE, tb-bp

SYS B ASC FEED 2 - OPEN, tb(2)-gray
Monitor SYS B Manf Press
SYS B MAIN SOV - CLOSE, tb-bp

GO/NO GO For LO

12-20

DATE 6/30/71

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***** L0-:5 (171:32) *****

CB(11) RR (AC) - Close

Check APS START CARD
Check APS, RCS, EPS, ECS

GO To LM TIMELINE BOOK

TWEAK APOLUNES (315R) FOR EARLY L.O. FOLLOWED BY LOSS OF COMM (COELLIPTIC SEQ.)

L.O. -	H _A	ΔV _X	CSI IS INS +	H _A MIN (CSM RESCUE)	BURN T/O / TPI (LM ACTIVE): NOM PAD	BURN T/O / TPI (CSM ACTIVE): NOM PAD -4 MIN 20% LM RCS _V FOR NAV ATT CONT RE-♀
8	166	~165	60	96		
7	155		59	91		
6	143		59	85		
5	132		58	80		
4	121		58	74		
3	110		57	68		
2	98	↓	57	63		
1	88	~50	56	57		

12-21

053
+ 01722

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE MAN
EVA PREP

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

EVA 3 PREP

DATE 6/30/71

ONE MAN EVA PREP

CABIN PREP-Perform EVA 1, 2 Or 3 As Rqd

EQPT PREP-Perform EVA 1, 2 Or 3 As Rqd

PLSS DONNING-Perform EVA 1, 2 or 3 As Rqd

Position Post EVA 1, 2 or 3 Cue Card
For Post EVA

NON EVA CREWMAN-Connected To LM 02,
Comm, & H2O
Gas Connector Plugs In PGA
PGA Diverter V1v - Horizontal

EVA CREWMAN: PGA Diverter V1v -
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

13-1

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

RECODER - ON
VHF Antenna - EVA

13-1

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

ONE MAN
EVA PREP

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-0, 02 Mom)
PLSS 02 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

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-0, 02 Mom)
PLSS 02 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 02 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 Req'd
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)

13-2

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OPS CONNECT

SUIT ISOL - SUIT DISC
Discn LM 02 Hoses, Secure About PGA

Connect OPS 02 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 &

02 Connectors (7) - Adjusted
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 02 - ON/OFF
PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON (Rt)

13-3

EVA-2 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

EVA-3 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

ONE MAN
EVA PREP

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)
CAB IN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS REG B - DIRECT 02
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 02 - ON (Tone-On, 02 Flag-0)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
02 Flag Clear

PLSS 02 - OFF (Monitor Cuff Gage For
1 Min, Report Decay)
PLSS 02 - ON (Cuff Gage 3.7-4.0
Psig, Tone & 02 Flag May Come On)
Verify 02 Flag Clear

13-4

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DATE 5/10/71

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 & H2O 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 (H2O 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

13-5

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

EVA-3 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

EVA 3 POST

EVA 2 PREP

ONE MAN
EVA PREP

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.

14-1

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

EVA-3 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

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+10 Move thru hatch
14 2

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Prepare LEC	0+10	Move thru hatch
Pass LEC to EVA Crewman		Deploy LEC
Photo EVA Crewman descend with 70mm camera		Descend to top of ladder Deploy MESA
LM 16mm Seq Cam - ON (12 FPS)		Descend to footpad
NOTE: Monitor & photograph EVA crewman using 70mm camera and LM 16mm Seq Cam. Read procedures to EVA crewman		Check ascent capability to lower ladder rung Step to surface
		Check and discuss mobility and stability
	0+20	Report LM status 14-3

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

EMER LAUNCH STOW
14-3

EVA-3 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)ONE MAN
EVA PREP

Transfer ETB to surface

16mm Cam - OFF
Change Mag
16mm Cam - ON

0+20 Report LM status

Transfer ETB
Hang on MESA

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

14-4

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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

0+40 Stow 70mm Cam and Contingency
14-5 sample in ETB

16mm Cam - OFF

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

EVA 3 POST

ONE-MAN EVA 1
(MIN TIME)
EVA PREP

0+40 Stow 70mm Cam and Contingency
sample in ETB

Transfer ETB into cabin

Remove 70 mm cam and contingency
sample from ETB

Pass LEC/ETB to CDR

Transfer ETB into cabin

Clean EMU
Climb ladder to porch
Receive & discard LEC/ETB

Ingress - Go to Post EVA
Procedures

0+50

14-6

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DATE 7/13/71

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.

15-1

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

EMER LAUNCH STOW

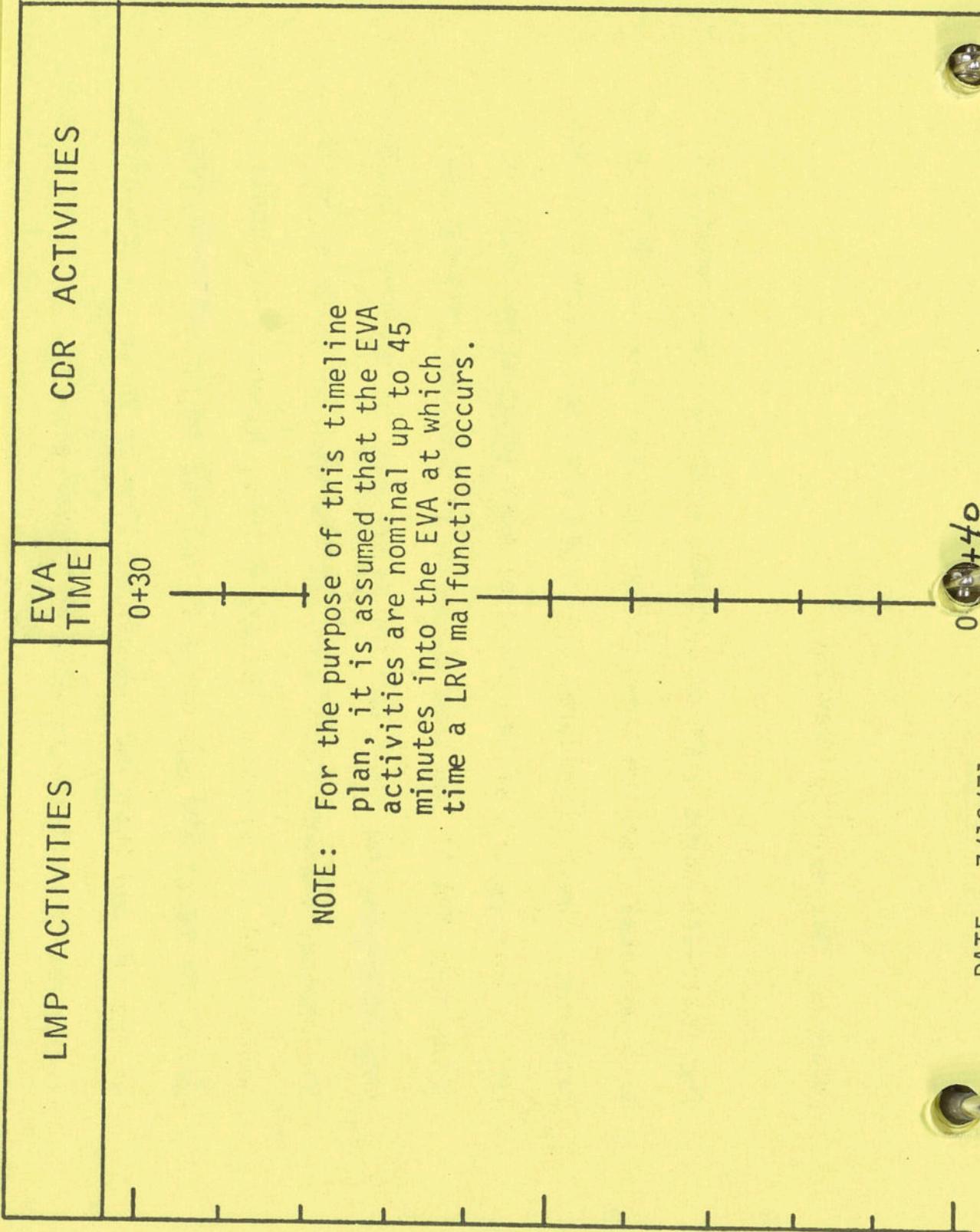
EVA-3 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP



0+40
15-

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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 handheld
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

15-3

EVA-2 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

EVA-1 TWO MAN
WALKING TRAVERSEONE-MAN EVA 1
(MIN TIME)ONE MAN
EVA PREP

1+10

Abandon LRV

Unstow and attach EVA-1 pallet
to MESA tableRemove & discard 16mm cam rack
Unstow & place ECS LiOH in
pallet pocketStow ETB on MESA table
Attach LEC to EVA-1 pallet

Climb LM ladder to porch

Abandon LRV

Remove Quad III thermal blankets
from geology palletOffload geology pallet from LM
and place on +Y footpadRemove & discard pallet handrails
Pull HTC stowage pip pin
Remove straps around HTC legsOpen HTC and swing out
Pull hinge pin lanyard to release
1+20 HTC
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- 1+20 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, 00 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 15-5

EVA-2 TWO MAN WALKING TRAVERSE

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN WALKING TRAVERSE

LAUNCH PREP

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

Descend to surface

Attach to CDR's PLSS:

- SCB #1 to left side
- SCB #2 to right side

Assemble & tether ext hndl/scoop

Close lid on SRC #1

Open LRV antenna can

Unstow LGA

Hand LGA to CDR

Assist CDR with LCRU
checkout

1+30

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

Tether tongs

Unstow the LCRU from MESA

Attach LCRU to back of LMP's PLSS

Install LGA on LCRU & connect
antenna cable

LCRU cb-closed
LCRU Pwr Sw - INT
LCRU Sel Sw - PMI/NB
Check LCRU AGC, Temp & Power
LCRU Sel Sw - PMI/WB

1+40

15-6

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- 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.

1+40 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 4.3-1 of
the Lunar Surface Procedures Document, Final Edition (7/9/71).

1+50
15-7

EVA-2 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

EVA-1 TWO MAN
WALKING TRAVERSEONE MAN
EVA PREPONE-MAN EVA 1
(MIN TIME)

- Arrive at LM
- Remove SCB #1 & #2 from CDR PLSS & stow on HTC
- Remove BSLSS from CDR PLSS & stow in sun
- Stow samples from SCB #2 in SCB #1
- Remove 6 core stems & 2 core stem cap disp from SRC #1 & stow in SCB #2 (on HTC)
- Unstow SWC from MESA
- Carry SWC 60 ft SE of LM
- Remove SWC from stowage can
- Extend SWC staff
- Deploy SWC foil
- 6+00 Arrive at LM
Orient TV to view LM area
Remove SCB #3 & #4 from LMP PLSS & place on LRV seat
Remove LCRU from LMP PLSS & stow in sun
Remove hammer, core tube tool & core tube cap disp from LMP PLSS & stow on HTC
- Retrieve from MESA & install filter on 70mm cam
- Retrieve gnomon
- Select site for polarimetric photography
- 6+10 Obtain far-field polarimetric photographs

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DATE 7/13/71

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
15-9

EVA-2 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF
EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

EVA-1 TWO MAN
WALKING TRAVERSEONE-MAN EVA 1
(MIN TIME)ONE MAN
EVA PREP

6+20

Retrieve gnomon & walk to LM

Stow samples in SCB #4

Unstow flag kit from MESA

Remove flag covering

Keep staff & pass flag to CDR

Retrieve hammer from HTC

Drive staff into surface

Photo CDR/Flag
Pass LMP 70mm cam to CDRStow hammer on HTC
Remove SCB #1 from HTC & place
in SRC #1

Remove SRC #1 seal protector

Close and seal SRC #1

Transfer all cam mags from

SCB #3 to ETB

6+30 15-10

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- Close and seal SRC #1
- Place SCB #4 on SRC #1
- Place SCB #3 on SCB #4
- Tidy MESA thermal blankets
- Unstow dust brush from geo pallet
- Clean CDR's EMU
- Stow dust brush on geo pallet
- Ingress LM carrying SCB #3
- Attach LEC to handheld
- Transfer SRC #1 into LM
- 6+30 Transfer all cam mags from SCB #3 to ETB
Remove mag from 500mm lens cam & stow in ETB
Stow 500mm lens cam on MESA
- Unstow dust brush from Quad III pallet
- Clean LMP's EMU
- Stow LMP's PLSS antenna
- Attach LEC to SRC #1
- 6+40 Transfer SRC #1 into LM
15-11

EVA-2 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF

EMER LAUNCH STOW

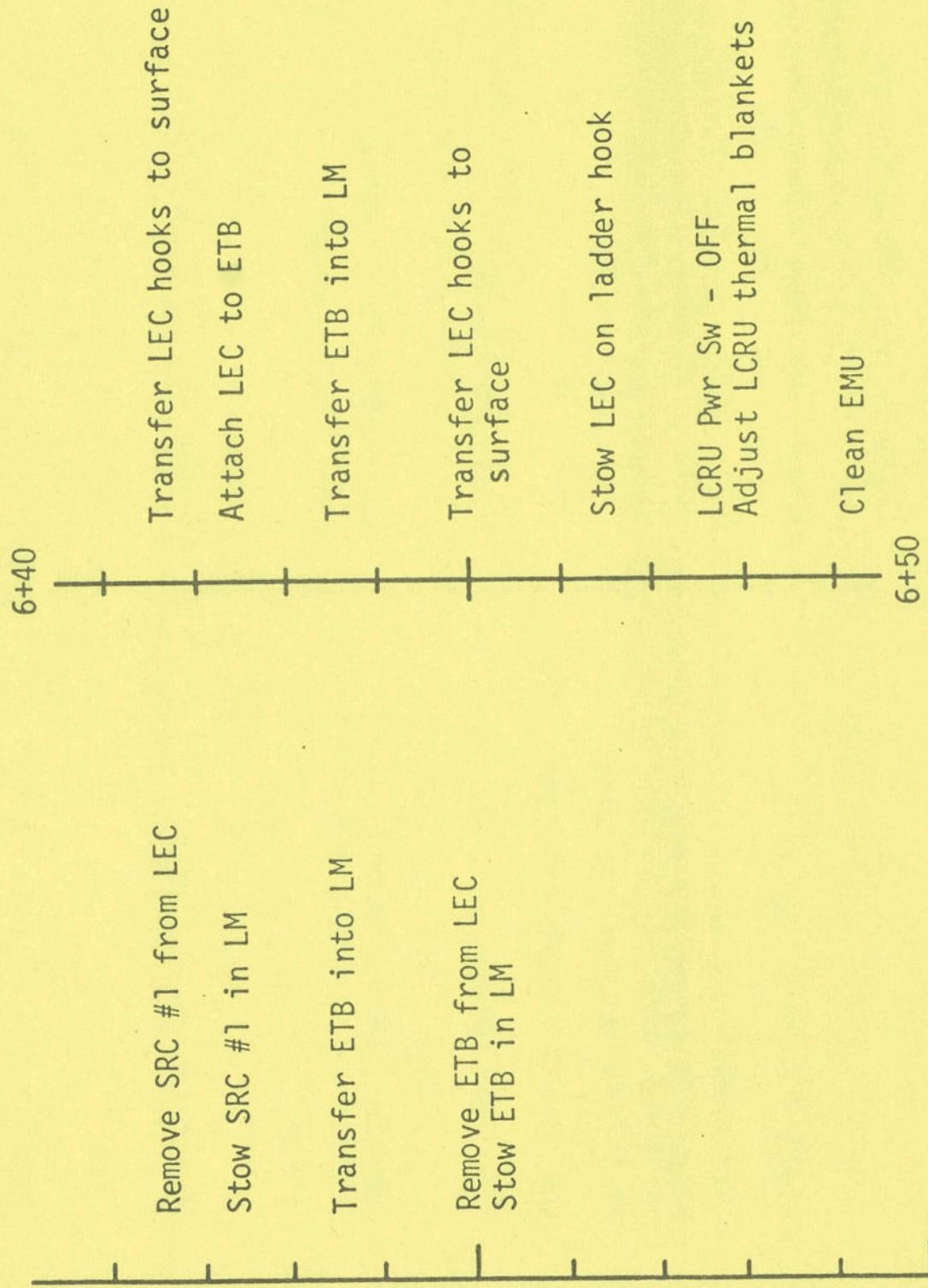
EVA-3 TWO MAN
WALKING TRAVERSE

LAUNCH PREP

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP



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DATE 7/13/71

6+50 Clean EMU
Ascend ladder carry SCB #4

+

Stow SCB #4 in LM
Pass LEC to CDR

+

Assist CDR - Stow CDR's
PLSS antenna

Hand SCB #4 to LMP
Stow LEC on platform

Ingress

NOTE: DETAILED PROCEDURES FOR
FINAL EVA CLOSEOUT ARE
PRESENTED IN SECTION 5
OF THIS DOCUMENT.

+

7+00 END 1st EVA
15-13

+

END 1st EVA

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-3 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF
EMER LAUNCH STOW

LAUNCH PREP

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

DATE 7/13/71

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.

16-1

EVA-2 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

Assist CDR; deploy CDR PLSS antenna
Place jett bag in hatch
Attach LEC to handheld
Ready ETB for transfer

Confirm "GO" for 2-Man EVA
Transfer pallet into LM

Disconnect LEC from pallet
Attach LEC to ETB
Transfer ETB to surface

0+10 Move thru hatch

Toss jett bag in Quad I
Hand LEC to LMP

Descend to surface

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

Describe additional LM site characteristics

Transfer ETB to surface

0+20
16-2

DATE 7/13/71

DATE 7/13/71

- 0+00 Disconnect and stow LEC
Remove & stow pallet equipment
- 0+20 Attach ETB to SRC table
Stow LEC on ladder hook
- Unstow drill from MESA & place
on surface
- Place pallet on LM floor
Recorder - OFF
Verify VOX Sens (2) - Max
Verify CB configuration
Utility & Floodlights - OFF
Move thru hatch
- Discard pallet into Quad I
Close hatch
- Descend to surface
- CDR deploys LMP PLSS antenna
- Open SEQ bay doors
- Get 70mm cam from ETB & photo
LMP egress
- Deploy LMP PLSS antenna
Position TV to view ALSEP
offload
- 0+30 Offload ALSEP pkg 1 (expts pkg)
16-3

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF
EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

Offload ALSEP pkg 2 (pwr pkg)

- 0+30 Offload ALSEP pkg 1 (expt pkg)
- Remove and discard boom-to-pkg-stick
Move pkg clear of SEQ bay
- Remove & discard boom-to-pkg stick
Position pwr pkg for fueling
Pull tool stowage pip pins (4)
Unstow UHT'S, pass one to CDR
Tether 2nd UHT
- Unstow & pass carry bar to CDR
Deploy fuel cask lanyard
Rotate fuel cask down & stow
lanyard
- Unstow & engage dome removal tool
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
Insert fuel element into RTG
Report RTG fueled
Removed & discard tool
- Assist LMP with RTG fueling
as required
- Check offload booms retracted
Close SEQ bay doors
- 0+40 Position TV to view ALSEP trav

16-4

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Tip pwr pkg up
Attach pwr pkg to carry bar
Carry ALSEP pkgs to deployment site

0+40

Get traverse map from ETB &
stow on HTC
Tidy MESA blankets
Carry ALS and HTC to ALSEP
site

0+50

16-5

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

- Place pkgs on surface with expts pkg in final position
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
- Report shorting switch amps
Connect RTG cable to C/S
- Release subpallet B. bolts (2)
Lift subpallet from PWR PKG & place 10' N. of PWR PKG
- Release SIDE B. Bolts (4)
& CCIG cover bolt
Lift SIDE from subpallet
Remove B. Bolt blocking cable reel

- 0+50 Survey ALSEP site
Place ALSD & HTC on surface
Orient ALSD to face sun

- Release HFE pallet B. bolts (2)
Lift HFE pallet from pwr pkg
Carry HFE pallet 15'N C/S
- Unstow HFE connector
Place HFE pallet on surface
Connect HFE cable to C/S
- Carry HFE pallet 30' N of C/S, deploying cable
- Place HFE pallet on surface & fold mounting braces

16-6

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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

16-7

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

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

Place PSE on stool

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 HFE cable

1+20

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- 1+20
- 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
 - 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
- 16-9

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

Check doors open & LSM free
of discarded parts

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
Release two inter B. Bolts
Release center B. Bolt and
raise sunshield

Remove sunshield covers
and discard (3)

Check sunscreens properly
deployed & engage velcro tabs

Retrieve & install antenna mast

Release antenna gimbal B-Bolts

Remove gimbal from subpallet

Remove gimbal housing cover

Install gimbal on mast

Remove housing & discard
Install antenna on gimbal

1+30

Remove drill from bore stem
Reset drill chuck

Place drill on surface
Retrieve probe from probe
box

Insert probe into bore stem
Retrieve probe rod from box
Push probe to bottom of stem
Report probe depth

Carry rack, rod and drill
to 2nd drill site
Place equipment on surface
Assemble 1st two bore stem
sections

Insert sections into drill chuck
Set drill bit down on surface
at mark on HFE cable
Drill bore stem into surface

Remove drill from bore stem
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
- 16-11

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

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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16 2

DATE 7/13/71

- 2+00 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
16-13

EMER LIFTOFF
(TIME CRITICAL)

EMER LAUNCH STOW

EVA-3 TWO MAN WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

- Place LRRR on surface
Pull alignment device pip pin
Pull reflector array pip pin
Deploy reflector array

Pull leveling leg pip pin
Deploy leveling leg
Tip LRRR down
Level and align LRRR

Remove dust covers
Recheck level and alignment
Photo LRRR & ALSEP

NOTE: Deploy LSM sun shield
after LSM photography complete

2+20
16-14

- 2+10 Remove drill from stem

Remove stem caps from SCB #2
Cap core stem top section
Retrieve stem wrench
Pull stem from treadle, breaking
each joint as it comes thru
treadle
Place stem on HTC
Cap stem bit end

Disjoint, cap, and stow stem
sections in SCB #2

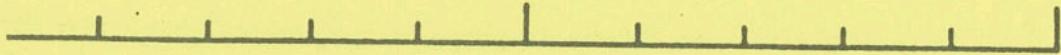
Discard UHT
Strip off outer protective gloves
and discard

Collect documented samples from
ALSEP area until LMP completes
ALSEP photos

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2+20



Discard UHT

Retrun to LM

Carry HTC

2+30 Return to LM

16-15

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EVA-3 TWO MAN
WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

Return to LM

2+30 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

16-16

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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- Place SCB #7 in +Y footpad
Place one 20 bag dispenser on
each 70mm camera
- Replace mag KK on LMP camera with
mag PP
- Attach to CDR PLSS tool harness:
SCB #5
BSLSS

2+40 Attach to LMP PLSS tool harness:

- SCB #2 & #6
- Core tube cap dispenser
- Hammer
- Core tube tool
- LCRU

LCRU Sel Sw - PM1/WB

Stow spare 70mm Mag's QQ & RR
in SCB #6

Tether scoop/ext handle

Attach 70mm cam to EMU

Tidy MESA blankets

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

16-17

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

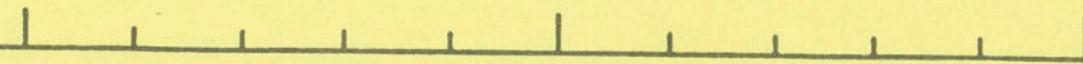
EVA-3 TWO MAN
WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP



6+20

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

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

DATE 7/13/71

1618

DATE 7/13/71

- Remove SCB #6 from HTC & carry to MESA
Remove 70mm mags from SCB #6 & stow in ETB
Leave SCB #6 on MESA
Remove SCB #2 from HTC and place on MESA
- Unstow dust brush from geo pallet
Clean CDR's EMU
- Ingress; carry SCB #6 into LM
- Attach LEC to handhold
- 6+30 Tidy harness velcro covers
Remove BSLSS from LMP PLSS & stow in sun (in thermal blanket)
Remove core stems from SRC #1 and stow in SCB #5
Fill SCB #5 with doc samples from SCB #6 (as required) and place in SRC #1
Remove SRC seal protector
Close & seal SRC #2
- Clean LMP's EMU & stow LMP PLSS antenna
- Stow dust brush on geo pallet
- Tidy MESA thermal blankets
- Stow maps in ETB
- 6+40 Attach LEC to SRC #2
16-19

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

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 ETB

Transfer ETB into LM

Transfer LEC hooks to surface
Stow LEC on ladder hook

Adjust LCRU thermal blankets

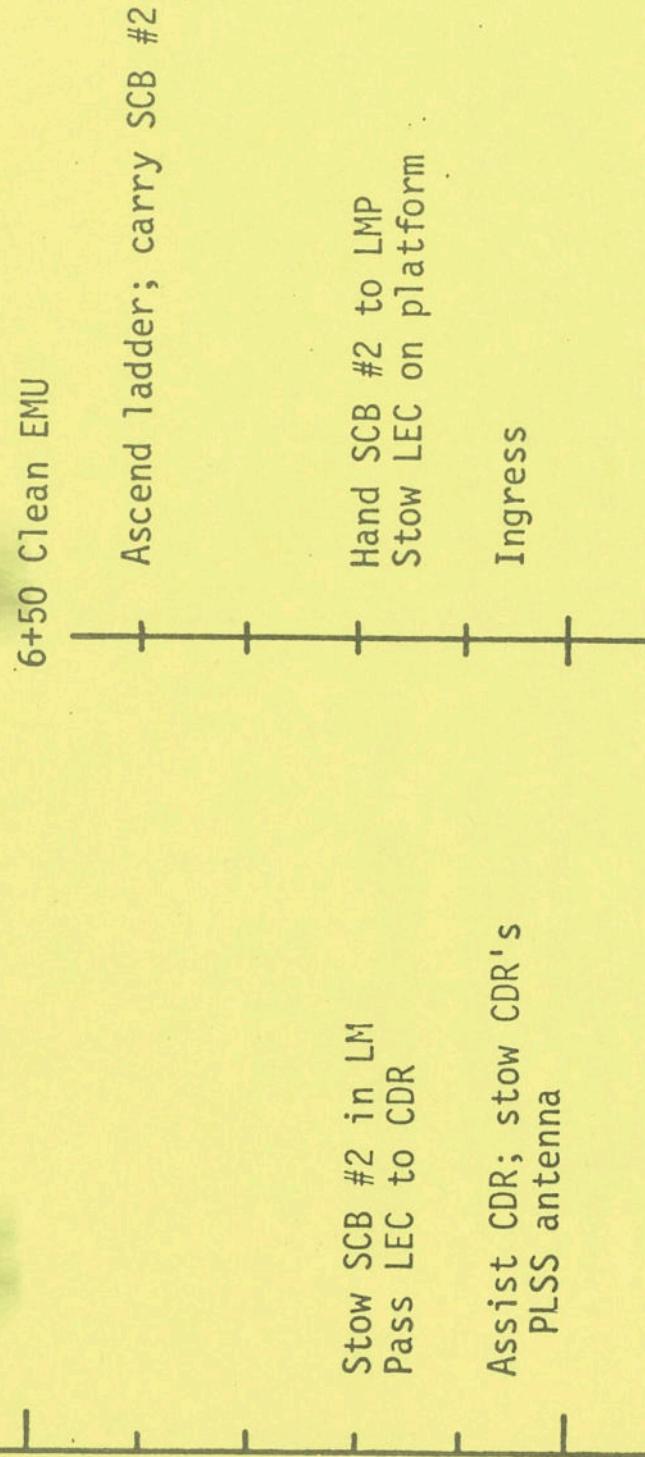
6+50 Clean EMU

16-20

16-20

DATE 7/13/71

DATE 7/13/71



NOTE: DETAILED PROCEDURES FOR FINAL EVA CLOSEOUT ARE PRESENTED IN SECTION 8 OF THIS DOCUMENT.

End 2nd EVA

7+00 End 2nd EVA

16-21

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

ONE MAN
EVA PREP

DATE 7/13/71

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.

17-1

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF
EMER LAUNCH STOW

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

EVA-3 TWO MAN
WALKING TRAVERSE

- Assist CDR; deploy CDR PLSS antenna

Place Jett bag in hatch

Attach LEC to handhold

Confirm "GO" for 2-man EVA

Transfer LEC hooks into LM

Attach LEC to ETB

Assist CDR

- Disconnect and stow LEC

Recorder-OFF

Verify VOX Sens (2) - Max

Verify cb config

Utility & floodlights - OFF

Move thru hatch

Close hatch

Decend to surface

CDR deploys LMP PLSS antenna

0+10 Move thru hatch

Toss Jett bag in Quad I

Hand LEC to LMP

Decend to surface

Transfer LEC hooks into LM

Transfer ETB to surface

Attach ETB to SRC table

Stow LEC on ladder hook

Retrieve LCRU batt from +Y
footpad
Change LCRU batt

0+20 Deploy LMP PLSS antenna

17-2

DATE 7/13/71

DATE 7/13/71

- 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
- 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 - PM1/WB
- Tether tongs
- Install 20 bag disp on 70mm cam
- Mount 70mm cam on EMU
- 0+30 Mount 70mm cam on EMU
- 17..3

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

MANUAL ASCENT

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

EVA-3 TWO MAN
WALKING TRAVERSE

- 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/

DATE 7/13/71

DATE 11/13/71

5+10

Arrive back at LM

Assist CDR

Remove SCB #7 from CDR PLSS
& stow on HTC
Photo surface under descent engine
Collect contaminated sample
in SES

Arrive back at LM

LCRU Pwr Sw - OFF
Remove LCRU from LMP PLSS &
place on surface

Discard tongs
Stow 70mm cam in ETB
Remove SES from SCB #7 & open
Hold SES for LMP

Photo contaminated sample area

5+20 Close & seal SES - stow in
SCB #7

17-5

EMER LIFTOFF
(TIME CRITICAL)

EMER LAUNCH STOW

MANUAL ASCENT

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

EVA-3 TWO MAN
WALKING TRAVERSE

Photo contaminated sample area

Discard scoop/ext handle

Doff BSLS and PLSS tool harness
& discard
Retrieve SWC foil

- 5+20 Close & seal SESC - stow in SCB #7
Remove SCB #8 & BSLS sample bag from LMP PLSS tool harness & stow on MESA table
Doff PLSS tool harness & discard
- (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
TV pwr SW - OFF
Remove TV from tripod
Mount TV on TCU
Connect TV power cable
Unstow HGA from canister
Carry HGA & TV/TCU to site
300' East of LM approx heading 096°.

Place SWC foil in bag from MESA & stow in ETB

Get LCRU & carry to site 300' East of LM approx heading 096°.

Assist CDR

5+30 Implace TCU staff in surface

17-6

DATE 7/13/71

DATE 7/13/71

- Assist CDR
Unstow HGA cable & discard foam
Connect cable to LCRU
Implace HGA staff in surface
and align HGA
Photo installation with 70mm cam
Return to LM
Adjust LCRU dust covers
Return to LM
Doff 70mm cam, remove mag &
stow in ETB
Unstow dust brush from geo pallet
Remove 70mm mags from SCB #8
& stow in ETB
5+40
- 5+30 Implace TCU staff in surface
Connect TCU to LCRU
Level TCU/TV (prop up with
rocks if reqd)
Switch LCRU - INT pwr.
- TV RMT

17-7

EMER LIFTOFF
(TIME CRITICAL)

EMER LAUNCH STOW

MANUAL ASCENT

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

EVA-3 TWO MAN
WALKING TRAVERSE

Clean CDR's EMU

Ingress, carry BSLSS bag into LM

Attach LEC to handhold
Transfer SCB #7 into LM

Remove SCB #7 from LEC

Transfer ETB into LM

Remove ETB from LEC
Discard LEC to porch.

CB(16) LTG TRACK - Close
SW: EXTERIOR LTG-TRACK
(CDR Check light on)
SW: EXTERIOR LTG - OFF

Check LM Dock light - ON
5+50 Check area

DATE 7/13/71

5+40 Clean CDR's EMU; stow LMP PLSS
antenna

Attach LEC to SCB #7

Transfer LEC hooks to surface

Attach LEC & ETB

Transfer ETB into LM

Clean EMU

17-8

DATE 11/13/11

SW: EXTERIOR LTG - OFF
CB(16) LTG TRACK - Open

Stow equipment & samples in LM

5+50 Check area
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

17-9

EMER LIFTOFF
(TIME CRITICAL)

EMER LAUNCH STOW

MANUAL ASCENT

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

ONE-MAN EVA 1
(MIN TIME)

EVA-3 TWO MAN
WALKING TRAVERSE

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.
EV 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	Comp

DATE 7/14/71

MANUAL ASCENT

EMER LAUNCH STOW

EMER LIFTOFF

EMER LIFTOFF
(TIME CRITICAL)

EVA-3 TWO MAN
WALKING TRAVERSE

EMER LAUNCH STOW

EVA-1 TWO MAN
WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

18-2

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 (both)	Floor (Secure)
Jett Bag	Tie To Floor. Place Double Cue Card On +Z27 Blkhd If Rqd
Fwd Hatch - Verify Locked	
Verify Snaps On RH & LHSSC	

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 Harnesses	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 <u>Before EVA 1 Chart</u>
OPS (Both)	Floor (Secure)
BSLSS Bag	+Z27. Place Double Cue Card On +Z27 Blkhd If Rreqd

Fwd Hatch - Verify Locked
Verify Snaps On RH & LHSSC

DATE 7/14/71

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

LRV: **MALF PROC
DECAL**

MANUAL ASCENT

EVA-3 TWO MAN
WALKING TRAVERSE

EMER LAUNCH STOW

EVA-1 TWO MAN
WALKING TRAVERSE

EVA-2 TWO MAN
WALKING TRAVERSE

18-4

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 Container
Cover Bags #7&8	Core Tube Container
Mags In LCG 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 <u>Before EVA 1 Chart</u>
OPS (Both)	Floor (Secure)
Jett Bag	Tie To Floor. Place Double Cue Card On +Z27 Blkhd If Rqd
Fwd Hatch - Verify Locked	
Verify Snaps On RH & LHSSC	

DATE 7/14/71

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	

DATE 7/14/71

EMER LIFTOFF

EMER LIFTOFF
(TIME CRITICAL)LRV: **MAFL PROC
DECAL**

MANUAL ASCENT

EVA-2 TWO MAN
WALKING TRAVERSE

EVA-1 TWO MAN
WALKING TRAVERSE

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

DATE 6/30/71

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/0-:45) *****

PGNS ACT

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
RSET
PRO (Hold In Until RESTART Lt-On,
STBY Lt-Off, NO DAP Lt-On)

19-1

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

LRV: MALF PROC
DECAL

MANUAL ASCENT

EVA-2 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

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 02 - CLOSE
ASC 02 No. 1 - OPEN

IF TIME PERMITS:

Connect 02 Hoses 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

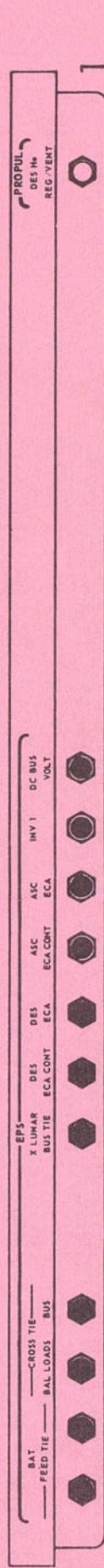
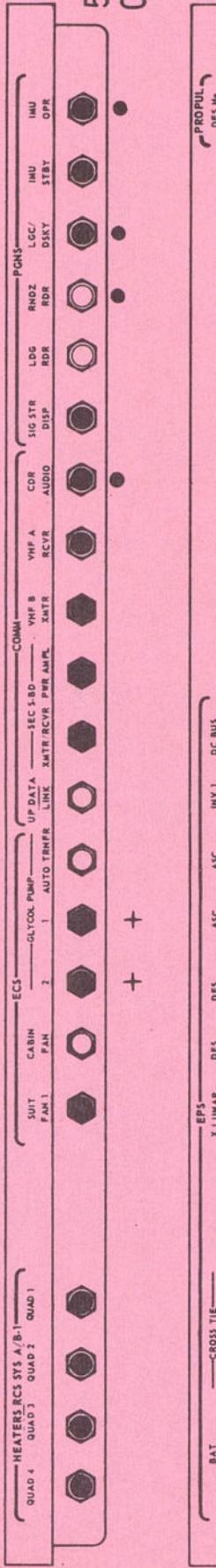
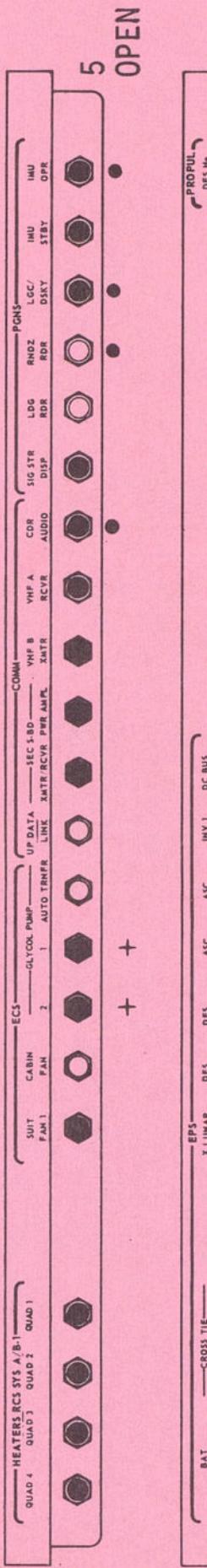
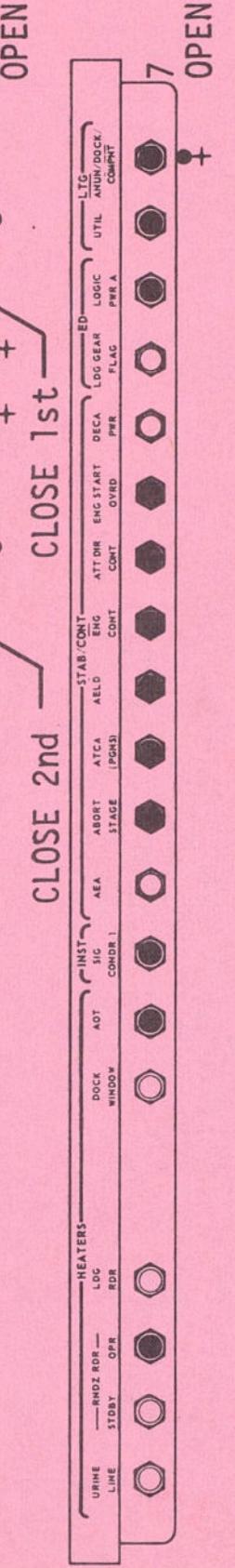
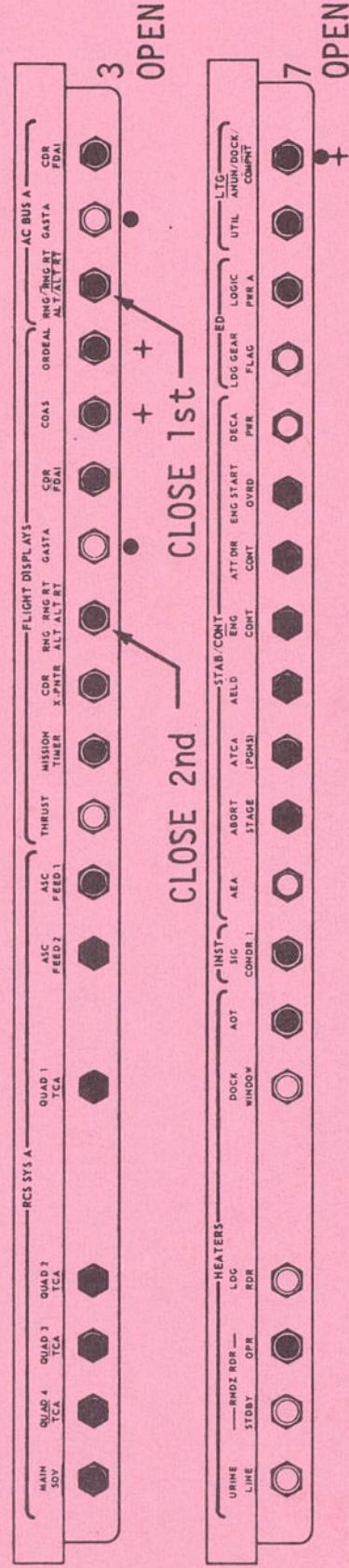
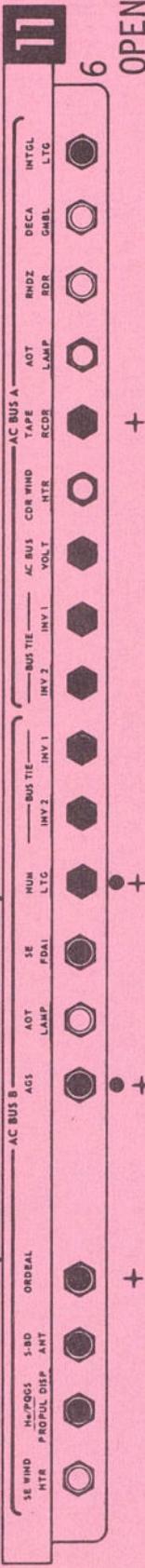
Configure CBs Per EMER LIFT OFF Status Charts

19-2

DATE 6/30/71

DATE 5/10/71

EMER LIFT OFF (NO GLYCOL INCLUDED)



{ REF EQUIP CYCLING PLAN
CONTINGENCY C/L PG 4-7
+ — OPEN FOR LOSS OF GLYCOL

19-3

EMER LIFTOFF
(TIME CRITICAL)

LM MENU

LRV:
MALF PROC
DECAL

MANUAL ASCENT

EVA-2 TWO MAN
WALKING TRAVERSE

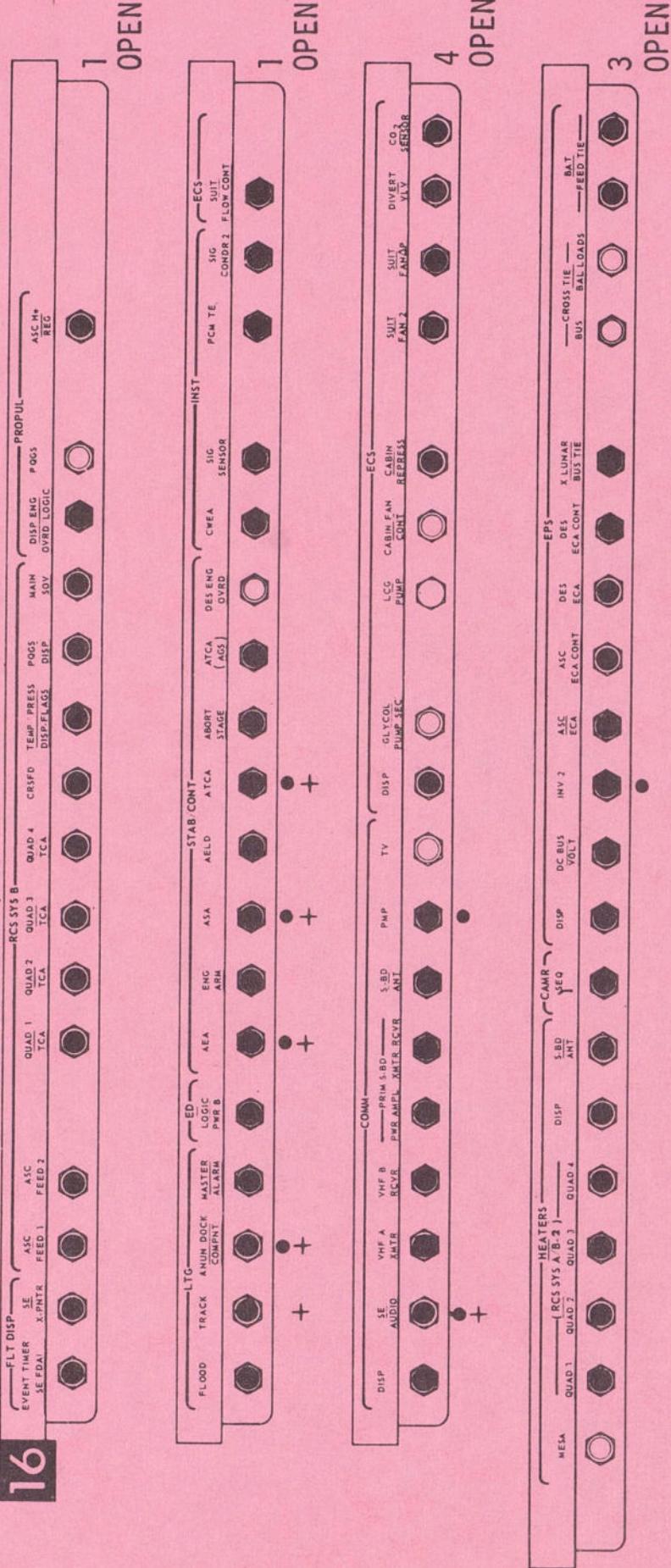
EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

EMER LIFT OFF (NO GLYCOL INCLUDED)

16



• — { REF EQUIP CYCLING PLAN
CONTINGENCY C/L PG 4-7
+ — OPEN FOR LOSS OF GLYCOL

19-4

DATE 5/10/71

DATE 5/10/71

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

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 + PRO
N22 ICUD ANGLES
PRO (NO ATT Lt - On/Off)
N05 PRO Angle Diff

19-5

EMER LIFTOFF
(TIME CRITICAL)

LM MENU

LRV: MALF PROC
DECAL

MANUAL ASCENT

NOTE: CLOCK INCREMENTED ONLY FOR A LOSS OF GLYCOL.

EVA-2 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

N93 Torquing Angles X
PRO Y
 Z

N25 00014 ENTR
POOE

***** (L/0-:17) *****

P S-BAND, Y (+75/-64)
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

19-6

DATE 5/10/71

DATE 5/10/71

TARGET PGNS

GUID CONT - PGNS
MODE CONT (2) - AUTO
P12E

N33 _____ : _____ : _____ TIG LO

PRO _____ VH FINAL (+55095)

N76 _____ 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)

19-7

EMER LIFTOFF
(TIME CRITICAL)

LM MENU

LRV: MALF PROC
DECAL

MANUAL ASCENT

EVA-2 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

V16 N65E, 377

V47E, 414+1E
400 + 3E
413 + 1E
400 + 4E

TARGET AGS

224	+	(+58118)
226	+	(+58118)
232	+	(+00600)
410	+	0
465	+	(+00195)
514	+	(-53334)
515	+	(-47371)
516	+	(+00000)
662	+	0E
673	+	0E

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

* CB(11) INV 1 - Close
* INV - 1
* CB(16) INV 2 - Open

19-8

DATE 6/30/71

DATE 5/10/71

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 -
AUDIO (Both): VHF A - T/R
VHF B - RCV
RECODER - ON

* CB(16) SE AUDIO - Close
* AUDIO CONT (CDR) - BU
* (LMP) - NORM
* CB(11) CDR AUDIO - Open

19-9

EMER LIFTOFF
(TIME CRITICAL)

LM MENU

LRV: MALF PROC
DECAL

MANUAL ASCENT

EVA- 2 TWO MAN
WALKING TRAVERSE

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

***** * (L/0- :05) *****

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

19-10

DATE 6/30/71

DATE 6/30/71

EMERGENCY L/O (TIME CRITICAL)

PRO (Hold In Until RESTART 1t - 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 RI
V21N01E, 1570E, Load
Copied Value

PRO
N06 00010
00000
00010

PRO
N22, PRO
N25 00014, ENTR, 12E

GUID CONT - PGNS
MODE CONT (P) - AUTO

20-1

EMER LIFTOFF
(TIME CRITICAL)

LM MENU

LRV: MALF PROC
DECAL

MANUAL ASCENT

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

(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

20-2

DATE 6/30/71

DATE 6/30/71

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

20-3

LM MENU

LRV : **MALF PROC
DECAL**

MANUAL ASCENT

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

EVA-3 TWO MAN
WALKING TRAVERSE

DATE 7/13/71

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)
- 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

If Time Allows:
V41N20E
Load ICDU Angles That
Existed After Touchdown
(See DATA BOOK Pg 6)
V40N20E (Releases IMU)
NO DAP For 11sec

MODE CONTROL (2) - ATT HOLD

Configure CB's Per EMER LIFT OFF
Charts (Pages 19-3 & 19-4)

21-1

LM MENU

LRV : **MALF PROC
DECAL**

MANUAL ASCENT

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

EMER LAUNCH STOW

MANUAL ASCENT

V48E, 12102, PRO
N47 LM Wt (+10,873)
PRO

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

P S-BAND, Y (+75/-64)
SLEW (>3.0)
TRACK MODE - AUTO
S-BAND RANGE - CWEA ENABLE

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

21-2

DATE 6/30/71

N, A — MSC

DATE 6/30/71

LOSS OF VOICE COMM with MSFN (LCRU)

LCRU:

LGA: AGC <2

MODE - FM/TV (HGA) - - - - -
CB LRV AUX - Close
POWER - EXT - - - - -

LGA or Rcvr 1
16.8V Batt Power

AGC >2 & POWER >1

MODE-PM1/NB (LGA) - - - - -
MODE-FM/TV (HGA) - - - - -

Downlink Sig Proc
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

22-1

LM MENU

LRV: MALF PROC
DECAL

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

LRV: MALF PROC
DECAL

MANUAL ASCENT

HGA: AGC < 2.5

MODE - PM1 / WB (LGA)
 CB LRV AUX - Close
 POWER - EXT - -

AGC >2.5 & POWER >1

MODE - PM2/NB (HGA)

MODE - PM1/WB (LGA)

AGC > 2.5 & POWER < 1

CB LCRU - Close

If CB Opens: MODE - PM1/WB(LGA)
CB LCRU - Close -
CB LRV AUX - Close
POWER - EXT - - - -

28V Overhead

S-Band Xmtr Short

22-2

DATE 6/30/71

DATE 6/30/71

LRV:

AMPS NOT BALANCED

1. DRIVE POWER Sw (4) - OFF (individually)

DRIVE POWER - JFF
DRIVE ENABLE - OFF

2. DRIVE ENABLE Sw (4) - PWM 1

PWM 2 Failure

3. DRIVE ENABLE Sw (4) - PWM 2

PWM SELECT Sw - PWM 1

4. DRIVE POWER Sw (4) - alt. pos.

PWM 1 Failure

5. DRIVE POWER Sw (4) - OFF (individually)
Isolate motor not drawing current

Drive Motor Power Circuit
Open For One Bus

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

22-3

LM MENU

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

LRV: MALF PROC
DECAL

MANUAL ASCENT

LOSS OF DRIVE FROM ALL WHEELS

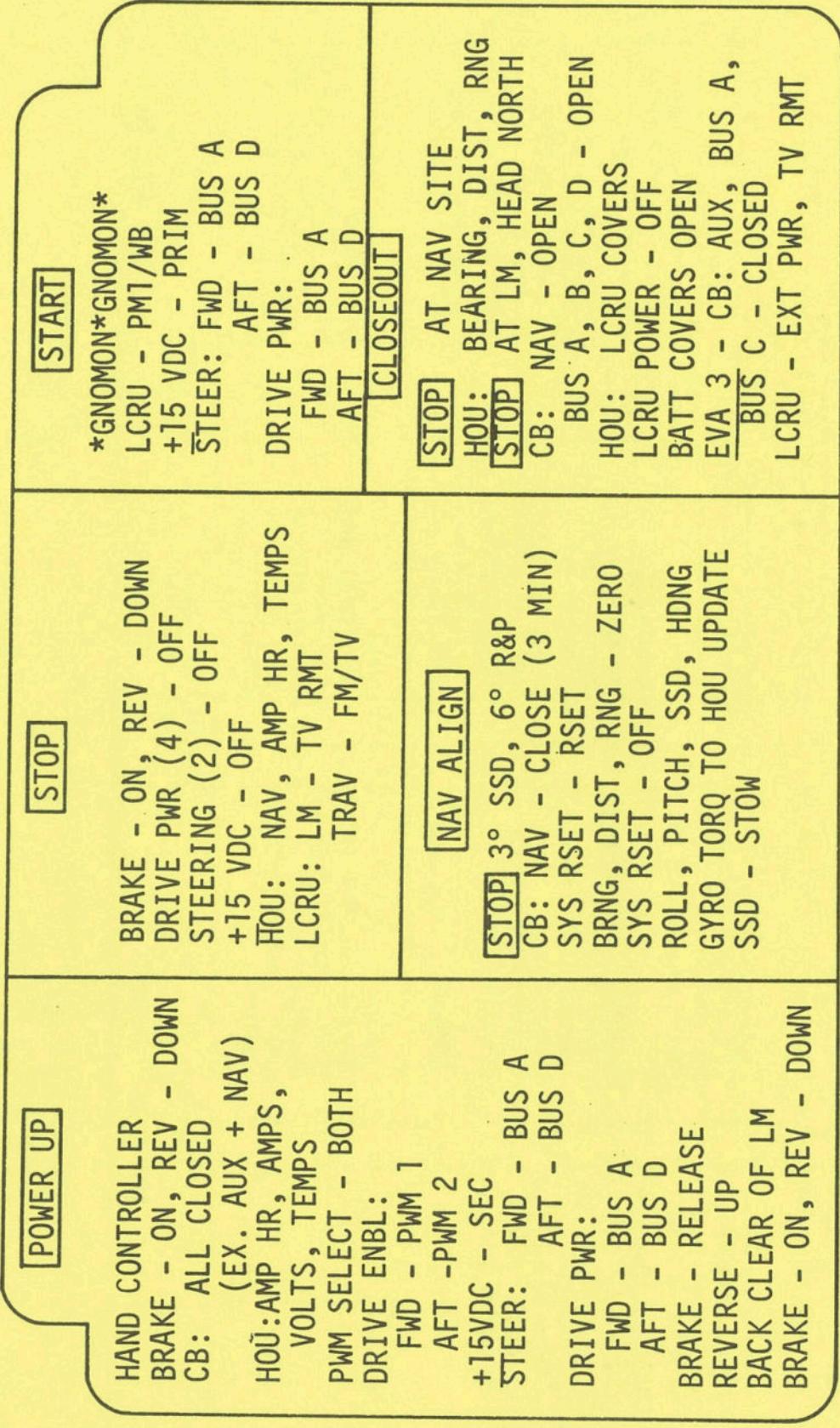
1. +15 VDC Sw - alt. pos.
2. Set Parking Brake
DRIVE ENABLE Sw (4) - PWM 2
PWM SELECT Sw - PWM 2
+15 VDC CB (2) - close
+15 VDC Circuitry
3. Set Parking Brake
DRIVE ENABLE Sw (4) - PWM 1
PWM SELECT Sw - PWM 1
+15 VDC CB (2) - close
PWM 1 Shorted
4. DRIVE POWER Sw (4) - OFF (individually)
+15 VDC CB (2) - close
DCE Shorted
5. STEERING POWER Sw (2) - OFF (individually)
+15 VDC CB (2) - close
Steering Shorted

22-4

DATE 6/30/71

DATE 6/30/71

DECAL:



22-5

LM MENU

EMER LIFTOFF
(TIME CRITICAL)

EMER LIFTOFF

LRV: MALF PROC
DECAL

MANUAL ASCENT

DATE

APOLLO 15 - LM-10 MENU

**DRINK WATER & BEVERAGES
CHECK ITEMS EATEN**

CDR - RED VELCRO
IMP - BLUE VELCRO

WP = Wet Pack
3 Extra Beverages per Man

IM MENU

EMER LIFTOFF
(TIME CRITICAL)

LRV: MALF PROC
DECAL

MANUAL ASCENT

14306

BRECCIA

- MANY FRAGMENTS OF VARIOUS
COLORS - LIGHT MATRIX - PITS
HAVE MORE IRREGULAR SHAPE
THAN ON A-II BRECCIAS (10019)
AND SOME EVEN HAVE
WHITISH HALOES. LINEAR
FRACTURE IS FILLED WITH
GLASS

14306



0 1 2 3 4 5 6 CM

EMER LIFTOFF
(TIME CRITICAL)

LRV: HALF PROC
DECAL

MANUAL ASCENT

12073 BRECCIA - LIGHTER COLORED MATRIX AND
MORE FRAGMENTS THAN A-11
BRECCIAS - TRANSITIONAL TO
A-14 BRECCIAS

NASA
70-44334



EMER LIFTOFF
(TIME CRITICAL)

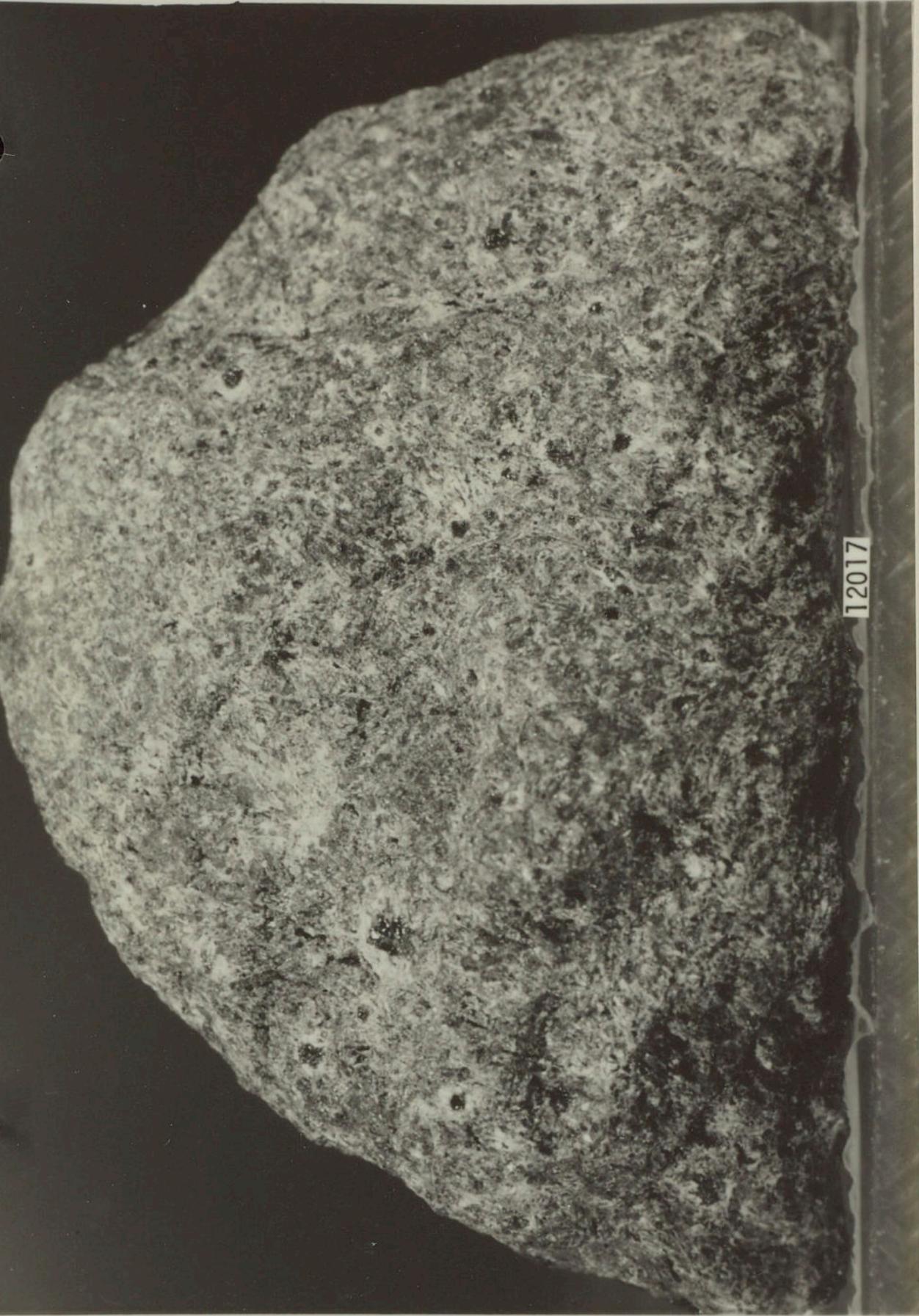
LRV: MALF PROC
DECAL

MANUAL ASCENT

12017

BASALT - LARGE BLACK GLASS
COATING - IRREGULAR VUGS

NASA
S-70-45307

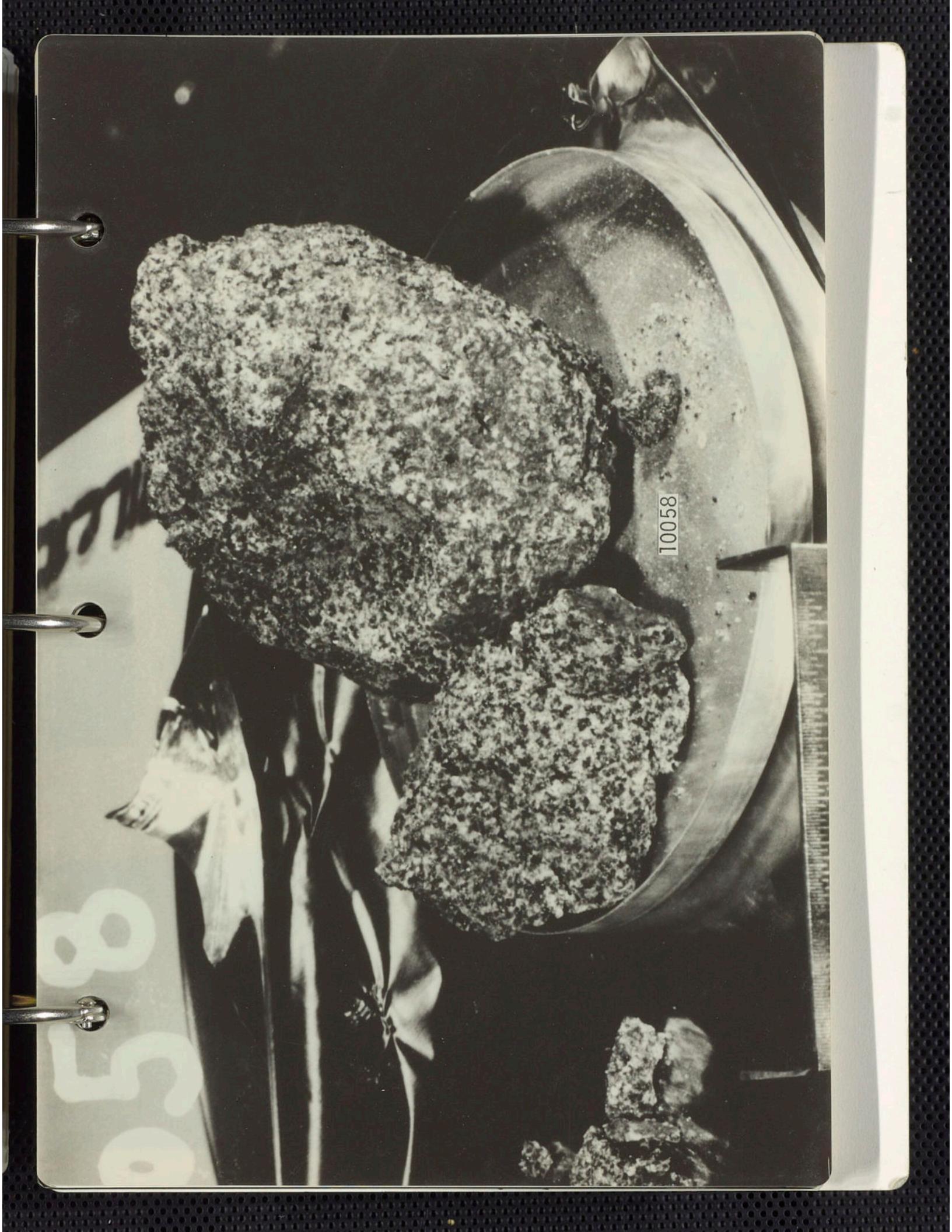


EMER LIFTOFF
(TIME CRITICAL)

LRV: MALF PROC
DECAL

MANUAL ASCENT

10058 CRYSTALLINE ROCK - DIABASE FOR GRAIN SIZE,
PLAG AND PYROXENE
COMPRISSE SALT AND
PEPPER APPEARANCE,
PITS NOT READILY
VISIBLE



10058

EMER LIFTOFF
(TIME CRITICAL)

LRV: MALF PROC
DECAL

MANUAL ASCENT

14321 BRECCIA

- LARGE LOOSELY HELD
FRAGMENTS



14321

EMER LIFTOFF
(TIME CRITICAL)

LRV: MALF PROC
DECAL

MANUAL ASCENT

10019 BRECCIA - WELL DEVELOPED PITS WITHOUT
HOLES, DARK EVEN GRAINED
MATRIX, FEW LARGE FRAGMENTS

10019

10019

N
A 6332
S-68



10019

EMER LIFTOFF
(TIME CRITICAL)

LRV: MALF PROC
DECAL

MANUAL ASCENT

10059 BRECCIA - DISTINCT ROUND PITS, NEARLY
BLACK MATRIX

10059

EMER LIFTOFF
(TIME CRITICAL)

LRV: MALF PROC
DECAL

MANUAL ASCENT

14318 BRECCIA - MANY LARGE SUBROUNDED AND SUBANGULAR FRAGMENTS OF VARIOUS COLORS WITH MANY GLASS LINED PITS - PITS ON CRYSTALLINE FRAGMENTS HAVE WHITE HALOES, THOSE ON MATRIX DO NOT



14318

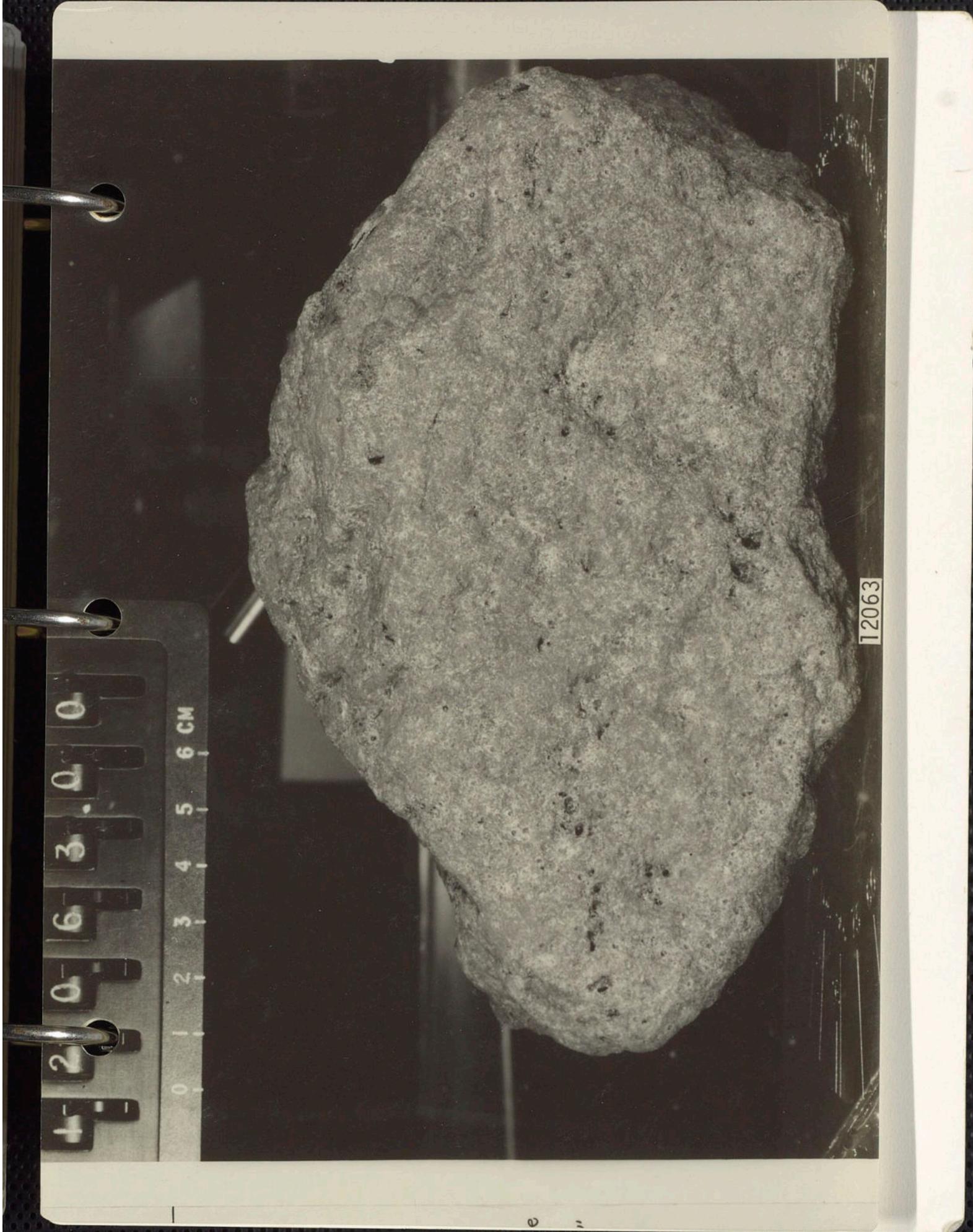
EMER LIFTOFF
(TIME CRITICAL)

LRV: MALF PROC
DECAL

MANUAL ASCENT

12063 BASALT - LAYER OF VESICLES, PITS
WITH HALOES, AND GENERAL
SURFACE WHITENING

12063



MANUAL ASCENT

MALF PROC
DECAL

LRV:

EMER LIFTOFF
(TIME CRITICAL)

