EMU MALF
ALSEP
GEOLOGY
EGRESS
H20 XFER
RU MF
V OFFLD
TB UNPK
GA & TV
AT #1
ALIGN
AT #2
AT #1
APOLLO 15
SCOTT WORDEN IRWIN

APOLLO 15

LUNAR SURFACE EVA 1
CUFF CHECKLIST

PREPARED BY: Joe H. Roberts
Joe H. Roberts

APPROVED BY: R. G. Zedekar
R. G. Zedekar

David R. Scott
D. Scott
CDR, Apollo 15

RRS.

EMU MALF | ALSEP GEOLOGY

CDR-1 CDR-2 EVA-1

PLSS TO LM H2O TRANSFER

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

LM TO PLSS H2O TRANSFER

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

EGRESS RU MF TB UNPK AT #1 AT #2
H2O XFER V OFFLD GA & TV ALIGN AT #1

20 XFER
EGRESS

CDR - EVA 1

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

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

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

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

CDR-3 CDR-4 EVA-2 EVA-1

EMU MALF

ALSEP
GEOLOGY

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

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

STAT #? CRU MF. TB UNPK AT #1 AT #2
STAT # LRV OFFLD GA & TV ALIGN AT #1

LRV OFFLD XFER
LCRU MF. GRESS

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

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

LCRU - To LRV
Cable - Connect

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

CDR-5
CDR-6
EVA 1
EVA
7/9/71

EMU MALF
ALSEP GEOLOGY

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

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

TV Camera - To TCU
TV Cable - Connect

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

STAT #3
STAT #2
SHUF
I #3
ETB UNPK
HGA & TV
AT #1
ALIGN
AT #2
AT #1

HGA & TV
ETB UNPK
RV OFFLD XFER
RU MF, GRESS

1+01 Whip Antenna - Deploy
LCRU Sel - PM1/NB
Check - AGC, TEMP, & PWR
LCRU Sel - TV RMT
LCRU Blankets - 100% open
Conn. Cover (LCRU) - Closed

HGA Dish - Deploy
HGA - Point To Earth

ETB Contents - To LRV
ETB (Empty) - To Ladder Hook
LMP PLSS Ant. - Stow
[LMP: Ingress]
1+09 LEC - To Pallet #1
Pallet #1 - Transfer
LEC Hooks - To Ladder Hook

HGA - Stow
1+12 LCRU Sel - PM1/WB

CDR-7
CDR-8
EVA-1
EVA-1

EMU MALF
ALSEP
GEOLOGY

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

NAV CB - CLOSE
LRV Systems - Readout
NAV ALIGN

STOP

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

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

STAT #3
STAT #2
SHUFFLE RQMT
STAT #1
NAV ALIGN

NAV ALIGN | A & TV | V OFFLD | XFER
STAT #1 | B UNPK | RU MF, | 3RESS

START Gyro - To Hou Update

1+25 TRAVEL (0:17)
- Possible Ray
- Lineaments, fillets, mounds
- Raised rille rim (levee)
- Block distribution
- 16mm - (f4; 1/260; 12 FPS)

1+42 CP1 (0:02) Canyon Crater
(023°/2.0 To LM)

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

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

EO

EMU MALF | ALSEP GEOLOGY

EO = ENTHUSIASTIC OBSERVATIONS

STATION 1

STAT #3 | SHUFFLE RQMTS | BLE C | STAT #2
STAT #2 | 1 #3 | EP OFFLD | SEP D | STAT #1

EMU MALF

ALSEP GEOLOGY

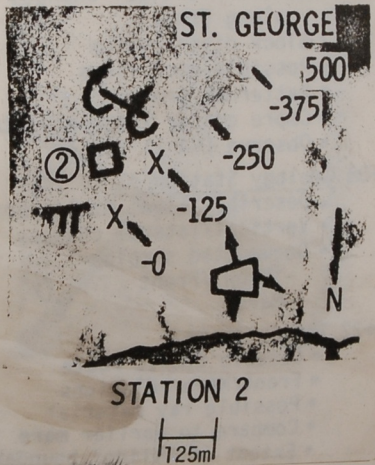
2+06 TRAVEL (0:08)

- Elbow ejecta distribution
- Change in slope toward front
- Change in rock type
- Change in ground texture
- St. George ejecta dist.

2+14 Geology Station #2 (0:45)

- Sample radially
- Comprehensive sample
- Documented sample
- Double core

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



2+59 TRAVEL (0:09)

- Lateral/Vertical changes along front
- Block distribution
- Possible rock flows
- Patterned ground
- Cmpre crater frequency/state
- Observe EVA II route

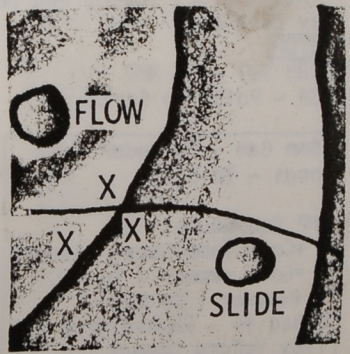
3+08 Geology Station #3 (0:14)

- Describe "Flow" Mtrl/source
- Vertical/lateral changes
- Documented samples-
  -"Flow"/Front
  (-Mare)

EO

3+22 TRAVEL (0:28)

- Observe EVA II route
- Front/Mare relations
- Possible ray material
- Compare to earlier mare
- Extent of "slide" boundary



STATION 3

125m

GEOLOGY
ALSEP

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

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

70mm Cam - To Under Seat
Tongs - To HTC

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

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

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

EMU MALF

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

Drill - To LRV
LRRR - To LRV

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

Drive to ALSEP SITE

CAUTION

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

GEOLOGY
ALSEP

SITE REQUIREMENTS:

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

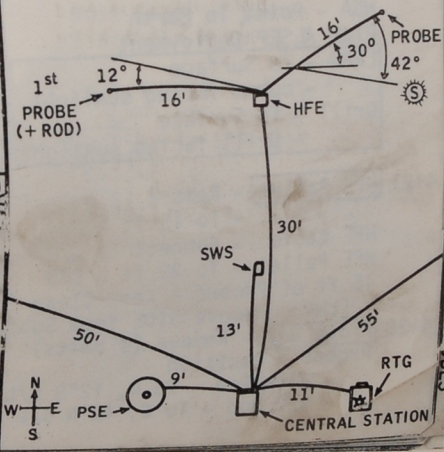
4+15 Park LRV
- Heading North
- Facing C/S Site

LRV Battery Temps - Readout

STOP

EMU MALF

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



GEOLOGY
ALSEP

EMU MALF

STAT #ALSEP DIA SEP OFFLD AT #3 AT #2
STAT #CABLE CNT TE RQMTS SHUFFLE AT #3

4+18

LCRU Sel - TV RMT
HGA - Point To Earth
Plan ALSEP Deployment

LRRR - To Surface
- cubes facing sunlight
Drill - To Surface
- Drill facing sunlight

4+21 HFE Pallet - Remove (2 bolts)
- To 15 ft N. C/S
HFE Cable - Connect To C/S
HFE Pallet - To 30 ft N C/S
16 ft of Probes - Keep Clean
[LMP: Remove SIDE from Subp]

4+28 Probe Box - Remove (4 bolts)
Probes - Position
- With Rod - To W, 12°S S/L
- W/O Rod - To E, 42°N S/L

CDR-19 CDR-20

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

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

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

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

LRRR CORE SEP-LM EAR FIELD GRESS
SEP PHO R FIELD & LOA CORE PROBES

GEOLOGY
ALSEP

PROBES | SEP DIA | SEP OFFLD | AT #2
CORE | LF CNT | TE RQMTS | SHUFFLEAT #3 | AT #3

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

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

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

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

CDR-22

EMU MALF

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

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

Rotate Stem Clockwise &
Pull Stem From Treddle

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

LRRR | SEP-LM | AR FIELD | GRESS
CORE | SEP PHO | R FIELD | B LOAD | 11,LCRU
10

GEOLOGY
ALSEP

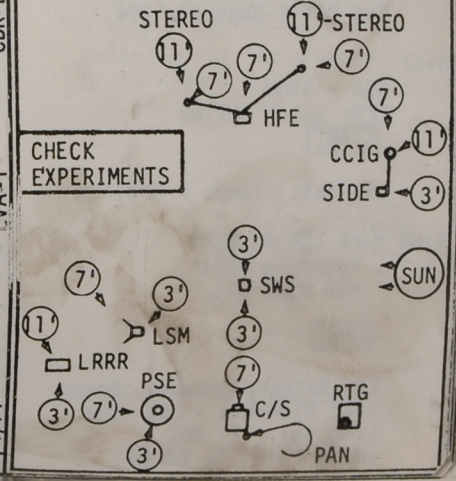
EMU MALF

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

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

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

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



EMU 3,4 ALSEP-LM
EMU 1,2 ALSEP PHO
AR FIELD
R FIELD
GRESS
B LOAD
11,LCRU
10

PROBES
CORE
SEP DIA
LE CNT
SEP OFFLD
TE RQMTS
T #
SHU
CORE
LRRR

CDR-23
CDR-24
EVA-1
EVA-1

GEOLOGY
ALSEP

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

5+57
HGA - Stow
LCRU Sel - PM1/WB
START

LRV Batt. Temps - Readout

6+03 Park LRV At MESA
•Heading North
•In Sunlight

STOP

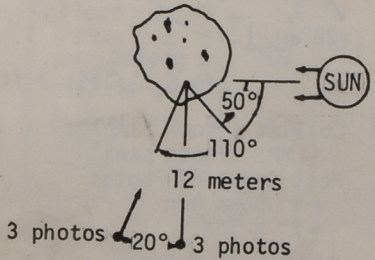
LRV Battery Covers - Open
LCRU Blankets - 35% open
LCRU Sel - TV RMT
HGA - Point To Earth

PROBES | SEP DIAL | SEP OF | ALSEP PHO | CORE
CORE | LE CNT | TE RON | ALSEP-LM | LRRR

DIR-26
COR-26
EVA-1
EVA-1

EMU MALF

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



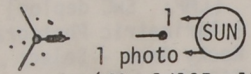
(f5.6, 1/125; 74 ft)

EMU 3,4 | EMU 5 | NEAR FIELD | 11,LCRU
EMU 1,2 | EMU 4A | FAR FIELD | PRESS | LOAD | 10

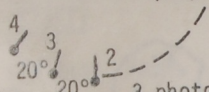
GEOLOGY
ALSEP

EMU MALF

6+19 Gnomon Place
Near Field Photos



1 photo
(f8; 1/125; 11 ft)



3 photos
(f5.6; 1/125; 7 ft)

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

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

CDR-27
CDR-28
EVA-1
EVA-1
7/1/71

6+25 Flag - Retrieve From LRV
- Mount in Staff
[LMP: Photo CDR/flag]
70mm Photo - LMP/Flag
(f-11, 11ft, 1/250)

6+28 ETB - To CDR Footpan
Collect in ETB
- 70mm Cams (2) (OO),(KK)
- 70mm Mags (2) (NN),(LL)
- 500mm Lens Cam Mag (MM)
- 16mm Mags (3) (CC),(DD)(EE)
- Maps

[LMP: Pack SRC #1]
Reseau Cover - To 500mm Cam
500mm Cam - Under CDR Seat
16mm Cam - Point North

ETB - To MESA Table
Bag "Covers" - To ETB

PROBES SEP E FAR FIELD SEP PHO CORE
CORE NEAR FIELD SEP-LM RRR

EMU 3,4 U 5 U 5(CON INGRESS 11,LCRU
EMU 1,2 U 4A U 5(CON ETB LOAD 10

GEOLOGY
ALSEP

EMU MALF

PROBES ETB LOAD R FIELD SEP PHO CORE
CORE INGRESS AR FIELD SEP-LM RRR

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

6+36 [LMP: Ingress]

LEC - To SRC #1
SRC #1 - Transfer

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

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

EMU MALF-1

EMU MALFUNCTIONS

EMU 1: Vent Flag-P, Tone-On
Fan-Off/On
If Flag Still On After 10 Sec:
OPS 02-On, Purge Vlv - LOW
(FAN Fail)

EMU 2: Pres Flag - D, Tone - ON
OPS -2 - ON, Pres Flag - Off
(Leak Or PLSS Reg Fail)
If Flag Still On: Ck Cuff Gage
>3.4, Ver TM, Ops 02 - OFF
(Press Sensor Fail)

EMU 3,4 U 5 U 5(CONT) U 8,9 11,LCRU
EMU 1,2 U 4A U 5(CONT) U 6,7 10

GEOLOGY
ALSEP

EMU MALF

PROBES ETB LOAD AR FIELD SEP TEMU 1,2
CORE INGRESS AR FIELD SEP-EMU 3,4

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

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

EMU MALF-2

EMU MALF-3

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

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

B-SLSS EMU 5 U 5(CONT) U 8,9 11,LCRU
B-SLSS EMU 4A U 5(CONT) U 6,7 10

GEOLOGY
ALSEP

EMU MALF

PROBES ETB LOAD AR FIEL EMU 4A U 1,2
CORE INGRESS AR FIE EMU 5 U 3,4

Off, Diverter As Desrd
(Subl Brkthru)
If Prim Or Aux H2O-Clsd:
Diverter-MIN, Prim & Aux H2O
Open, Wait 4 Min Or H2O Flag
Off, Diverter As Desrd

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

EMU MALF-4
7/1/71

EMU MALF-5
7/1/71

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

B-SLSS DOE
B-SLSS DON

EMU 5(CONT) 8,9
EMU 5(CONT) 6,7

11,LCRU
10

(Tone Or H2O Flag Fail Or Subl Degrd) [If No BSLSS, OPS O2-On, Purge Vlv-Hi]
Ver TM For Subl Restart: Prim H2O-Clsd, Diverter-MAX, Wait 5 Min, Diverter-MIN, Prim H2O Open, Wait 4 Min, Diverter As Desrd (Subl Brkthru)
If Prim Or Aux H2O-Clsd & On Aux H2O: Diverter-MIN, Prim & Aux H2O-Open, Wait 4 Min, Diverter As Desrd (H2O Flag Fail)

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

EMU 7: PLSS O2 Qty Ind Abnormal
Ck Cuff Gage Or O2 Flag-0
If Cuff Gage >4.0, OPS O2-On, PLSS O2-Off (PLSS Reg Fail)
If Cuff Gage <3.7 Or O2 Flag-0, OPS O2-On (Leak)
If No Apparent Failure, Ver TM (Ind Or X-ducer Fail Or Leak)

EMU 8: Cuff Gage >4.0

If O2 Flag-O Or PLSS O2 Decr, OPS O2-On, PLSS O2-Off (PLSS Reg Fail)
If Neither, Ver TM (Gage Fail)

EMU 9: Loss Of Pump Noise

If No Side Tone, OPS O2-On, Purge Vlv-LOW, Act. BSLSS (Power Fail) [If No BSLSS, OPS O2-On & Purge Vlv-Hi]
If Sidetone OK, Ver Pump-On. If Add'l Cooling Reqd, Act. BSLSS (Pump Fail) [If No BSLSS, OPS O2-On, Purge Vlv-Hi]

EMU 10: Cooling Inadequate

Ver Diverter-MAX & Pump-On
Ver Prim & (If On Aux) Aux H2O Open: If Open, Act. Gas Trap 5 Sec, Wait 3 Min, If Add'l Cooling Reqd, Act. BSLSS (Flow Restr, Subl Or Pump Degrd, Or Heat Leak) [If No BSLSS, OPS O2-On, Purge Vlv-Hi]
Ver TM For Aux H2O Act; Diverter MIN, Aux H2O-Open, Wait 4 Min, Diverter As Desrd (Prim H2O Depletion)
If Prim Or (If On Aux) Aux H2O Clsd: Diverter-MIN, Prim & (If On Aux) Aux H2O-Open, Wait 4 Min, Diverter As Desrd (H2O Flag Fail)

GEOLOGY
ALSEP

EMU MALF

EMU 10 | U 6,7 | U 5(CONT) | 4A | 1,2
EM 11,LCRU | U 8,9 | U 5(CONT) | 5 | 3,4

EMU 11: Loss Of Voice Comm (LM)

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

LCRU 1: Loss Of Voice Comm (LCRU)

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

EMU MALF-10
7/1/71

EMU MALF-11
7/1/71

BSLSS Don And Activate

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

B-SLSS DOE
B-SLSS DON

GEOLOGY
ALSEP

EMU MALF

BSLSS Doff

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

EMU MALF 12

EMU 10	U 6,7	U 5(CONT)	4A	B-SLSS DON
EM 11,LCRU	U 8,9	U 5(CONT)	L 5	B-SLSS DOF

GEOLOGY
ALSEP
EMU MALE
Tom Mattingly