



**Aerospace
Systems Division**

ALSEP Configuration E Two-Man
Deployment Task Sequence

ATM 1073

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DATE 24 February

The Apollo Lunar Surface Experiments Package (ALSEP) Configuration E two-man deployment sequence, based on the latest Apollo 17 flight configurations and design is incorporated in this ATM.

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The following assumptions and conditions are applicable to this deployment sequence:

- 1) The sequence is for ALSEP Flight 6, Configuration E.
- 2) The sequence is for the two-man deployment planned for ALSEP.
- 3) The Lunar Module (LM) is oriented on the lunar surface with the Scientific Equipment Bay (SEQ) facing southeast.
- 4) The commander and the LM Pilot maintain constant voice contact while deploying ALSEP.
- 5) The voice link during the command/LM pilot and Mission Control Center (MCC), during ALSEP deployment, is through the LM directly to MCC.
- 6) The Commander and the LM Pilot are pressurized to 3.75 psi in Extravehicular Mobility Units (EMU) during ALSEP deployment.
- 7) The times in hours, minutes, and seconds are based on part-task tests conducted with Crew Engineering mock-ups.
- 8) The deployment site is in the SW quadrant of the moon (Alphonsus) with the text referring to same. A NE deployment site geometry is presented for reference only, page 138 (A).

This ATM includes both a condensed timeline and detailed timeline deployment sequence. The condensed timeline is essentially a major task flow analysis along a time base, showing the major points of interaction between the two crewmen. The detailed timeline lists, in sequence of performance, each of the steps required to carry out the main tasks identified in the condensed timeline. It is in the detailed timeline that the crew/equipment interfaces are revealed.

Both timelines present the CDR's and the LMP's tasks side-by-side so that no confusion will exist as to which crewman is doing what, or how the two cooperate in the operations on the lunar surface.

APOLLO 17 ALSEP CONDENSED TIMELINE

| Task No. | CDR | Time | Task No. | LMP | Time |
|----------|--|----------|----------|-------------------------------|----------|
| | <u>EVA #1</u> | | | <u>EVA #1</u> | |
| C1.0 | Open SEQ Bay Doors | 00:00:00 | | | |
| C2.0 | Offload ALSEP Pkg #2 | 00:01:00 | | | |
| | | | P1.0 | Offload ALSEP Pkg #1 | 00:02:35 |
| C3.0 | Remove Tools and Carry Bar | 00:03:05 | | | |
| | | | P2.0 | Fuel RTG | 00:04:50 |
| C4.0 | Offload ALSD | 00:07:00 | | | |
| | | | P3.0 | Configure ALSEP for Traverse | 00:09:00 |
| C5.0 | LRV Traverse to Deployment Site (Site Survey) | 00:10:00 | P4.0 | Close SEQ Bay Doors | 00:10:00 |
| | | | P5.0 | ALSEP Traverse | 00:11:00 |
| | | | P6.0 | Position ALSEP at Site | 00:21:00 |
| | | | P7.0 | Remove HFE and LEAM Pull Pins | 00:22:35 |
| | | | P8.0 | Rotate Pkg #2 | 00:23:25 |
| C6.0 | Offload HFE Subpallet | 00:24:00 | | | |
| C7.0 | HFE Connect | 00:24:50 | | | |
| | | | P9.0 | Offload LEAM Subpallet | 00:25:00 |

| Task No. | CDR | Time |
|----------|------------------------------|----------|
| | <u>EVA #1</u> | |
| C8.0 | HFE Subpallet Deploy | 00:27:10 |
| C9.0 | Offload HFE Probe Pkgs. | 00:29:05 |
| C10.0 | Separate Probe Pkgs. | 00:30:30 |
| C11.0 | Locate First Bore Hole Site | 00:31:35 |
| C12.0 | Locate Second Bore Hole Site | 00:33:05 |
| C13.0 | ALSD Set-Up | 00:34:30 |
| C14.0 | Drill First Bore Hole | 00:42:00 |

| Task No. | LMP | Time |
|----------|---|----------|
| | <u>EVA #1</u> | |
| P10.0 | LEAM Connect | 00:26:05 |
| P11.0 | Deploy RTG Power Cable | 00:28:40 |
| P12.0 | RTG Connect | 00:30:40 |
| P13.0 | Traverse Gravimeter Experiment (TGE) Read | 00:32:00 |
| P14.0 | Disconnect Carry Bar from Pkg #1 | 00:34:00 |
| P15.0 | Emplace Pkg #1 | 00:34:35 |
| P16.0 | Offload LSG | 00:36:55 |
| P17.0 | Offload LSPE Geophone Module | 00:38:55 |
| P18.0 | Offload LMS | 00:40:55 |
| P19.0 | Release Central Station Sunshield | 00:43:25 |

| Task No. | CDR | Time | Task No. | LMP | Time |
|----------|---|----------|----------|--|----------|
| | <u>EVA #1</u> | | | <u>EVA #1</u> | |
| C15.0 | Emplace First Probe | 00:54:00 | P20.0 | Deploy Central Station Sunshield | 00:51:10 |
| | | | P21.0 | Deploy Aiming Mechanism | 00:54:00 |
| | | | P22.0 | Activate Central Station | 01:01:00 |
| C16.0 | Transfer Equipment | 01:02:00 | | | |
| C17.0 | Drill Second Bore Hole | 01:04:00 | | | |
| | | | P23.0 | Deploy LSG | 01:11:30 |
| C18.0 | Emplace Second Probe | 01:16:00 | | | |
| | | | P24.0 | Deploy LEAM | 01:16:15 |
| | | | P25.0 | Deploy LMS | 01:20:25 |
| C19.0 | Align HFE Electronics Pkg | 01:23:00 | | | |
| | | | P26.0 | Deploy LSPE Remote Antenna | 01:24:00 |
| C20.0 | Deep Core Activities | 01:27:00 | | | |
| | | | P27.0 | ALSEP Photography (Documented Sampling) | 01:30:00 |
| C21.0 | Deploy LSPE Geophone Module | 02:12:00 | | | |
| C22.0 | Deploy LSPE Geophone (1st, 2nd, and 4th) | 02:17:00 | | | |
| | | | P28.0 | Deploy LSPE Geophone (3rd) | 02:29:00 |

| Task No. | CDR | Time | Task No. | LMP | Time |
|-------------|--|------|-------------|---|----------|
| | <u>EVA #1</u> | | | <u>EVA #1</u> | |
| | | | P29.0 | Photograph Geophones (At end of EVA #1) | 02:33:15 |
| | | | P30.0 | Offload Explosive Package Transport Frame #1 and Stow on LRV (in sun). | |
| | <u>EVA #2</u> | | | <u>EVA #2</u> | |
| C1.0 | Traverse to Explosive Package #1 Deployment Site (on return to LM from EVA #2) | | P1.0 | Offload QUAD III Expt. Pallet from LM and place pallet on side, facing sun. | |
| | | | P2.0 | Traverse to Explosive Package #1 Deployment Site (on return to LM from EVA #2) | |
| | | | P3.0 | Deploy Four Explosive Pkgs. (#1, #2, #3, and #4)-Deployment Time per Explosive Pkg. [not including traverse time] - 02:30 minutes. | |
| | | | P4.0 | At end of explosive package deploy- ment, release latch securing tran- sport frame #1 to LRV, remove transport frame #1 and discard. | |

Task
No.

CDR

Time

EVA #3

C1.0 Traverse to Explosive Package #5
Deployment Site (on return to LM
from EVA #3)

Task
No.

LMP

Time

EVA #3

(At beginning of EVA #3)
P1.0 Offload Explosive Package
Transport Frame #2 and
stow on LRV.
P2.0 Traverse to Explosive Package #5
Deployment Site (on return to LM
from EVA #3)
P3.0 Deploy Four Explosive Pkgs (#5,
#6, #7, & #8)-Deployment Time
per Explosive Pkg (not including
traverse time) - 02:30 minutes.
P4.0 At end of explosive package deploy-
ment, release latch securing
transport frame #2 to LRV, re-
move transport frame #2 and
discard.

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|---------------------------|---|----------------------|-------------|
| | <u>EVA #1</u> | | <u>EVA #1</u> | |
| C1.0 | <u>Open SEQ Bay Doors</u> | 00:00:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 00:01:00 | | |

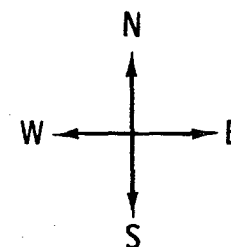
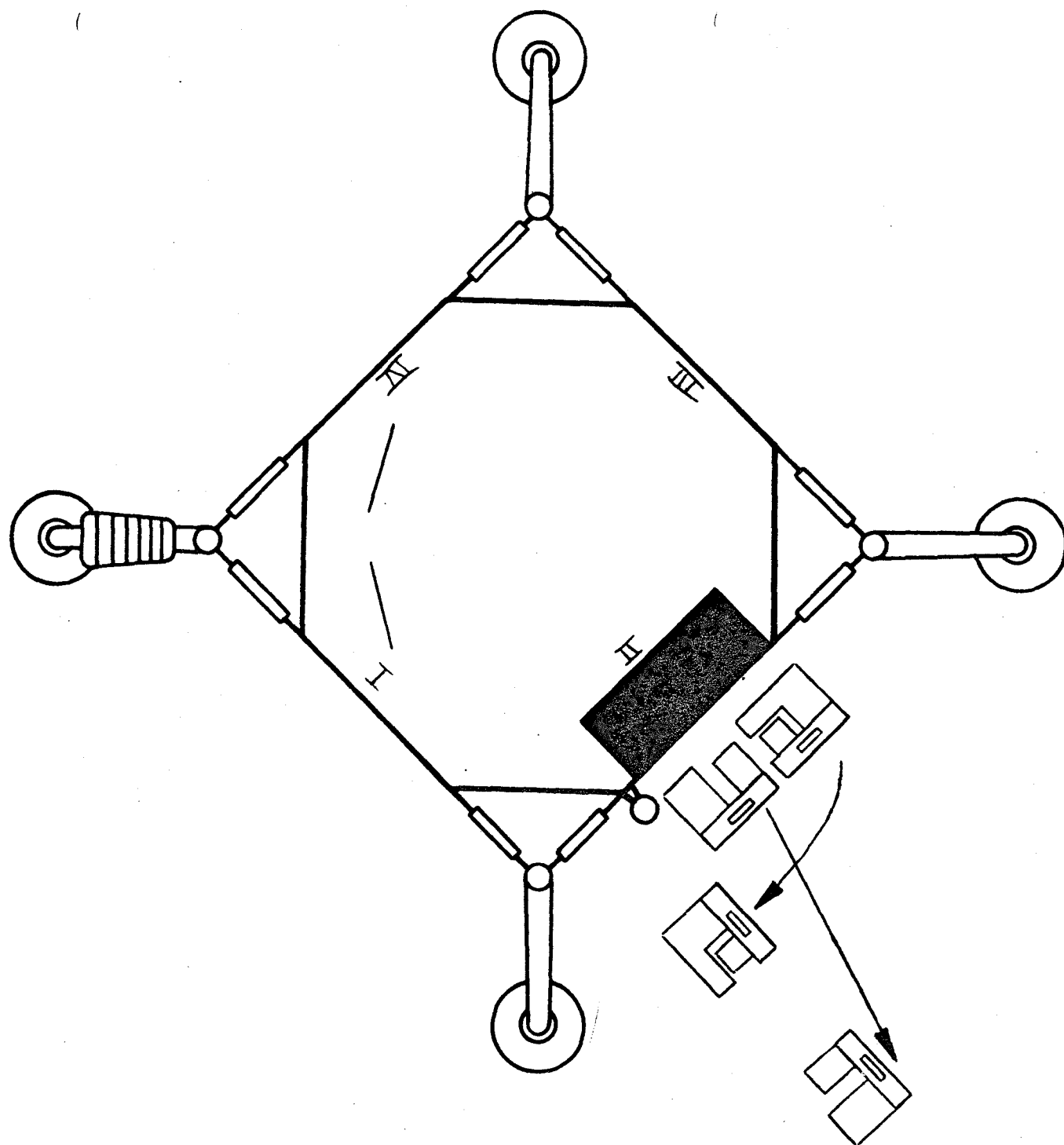


Figure 1 Remove Packages

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|-------------------|----------|
| C2.0 | <u>Offload ALSEP Pkg #2</u> | 00:01:00 | | |
| C2.1 | Move to Pkg 2. | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| C2.2 | Remove Pkg 2 release lanyard from package handle. | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| C2.3 | Pull release lanyard until pkg unlocks. | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C2.4 | Grasp handle and remove pkg from SEQ bay. | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| C2.5 | Lower pkg to lunar surface with handle up. | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:02:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|---|----------|
| | | 00:02:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| C2.6 | Remove pull pin to free handling assy from package and discard handling assy. | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| C2.7 | Lift Pkg 2, carry to a point next to astronaut protection door, and lower to lunar surface. | :34 | <u>Offload ALSEP Pkg #1</u> | P1.0 |
| | | :36 | Move to Pkg 1 | P1.1 |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | Remove Pkg 1 release lanyard from package handle. | P1.2 |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | Pull release lanyard until pkg. unlocks. | P1.3 |
| | | :56 | | |
| | | :58 | | |
| | | 00:03:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|--|---|----------|
| C3.0 | <u>Remove Tools & Carry Bar</u> | 00:03:00 | | |
| C3.1 | Remove the tool - restraining pull pin and discard. | :02 :04 :06 :08 :10 :12 | Grasp handle and remove pkg from SEQ bay. | P 1.4 |
| C3.2 | Remove the tool bracket assy and discard. | :14 :16 :18 :20 :22 | | |
| C3.3 | Remove the two Universal Handling Tools (UHT). | :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 | Lower pkg to lunar surface with handle up. | P 1.5 |
| C3.4 | Engage the first UHT in pkg 2 temporary stowage socket. | :44 :46 :48 :50 :52 | | |
| C3.5 | Walk to pkg 1. | :54 :56 :58 00:04:00 | Remove pull pin to free handling assy from package and discard handling assy. | P 1.6 |

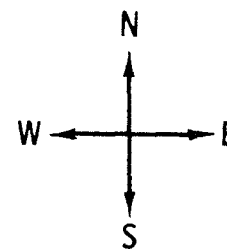
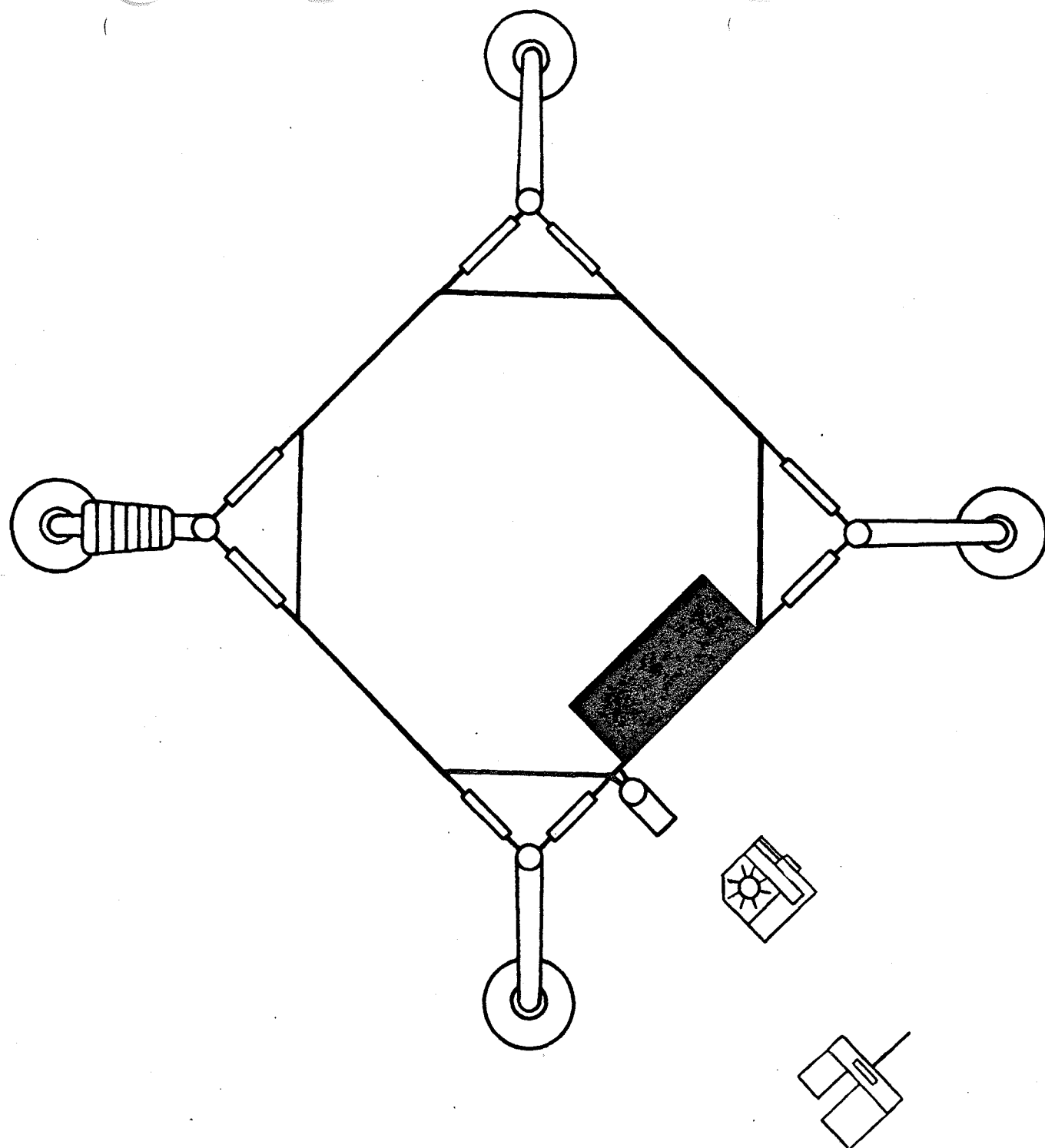


Figure 2 Fuel RTG

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|---|----------|
| C3.6 | Engage the second UHT in pkg 1 temporary stowage socket. | 00:04:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| C3.7 | Return to pkg 2 | :10 | Lift pkg 1, carry to a point next to astronaut protection door, and lower to lunar surface. | P 1.7 |
| | | :12 | | |
| C3.8 | Remove carry bar | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C3.9 | Extend carry bar and lock telescope mechanism. | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| C3.10 | Walk to pkg 1 | :40 | Walk to fuel cask. | P 1.8 |
| | | :42 | | |
| C3.11 | Install carry bar in fitting on pkg 1. | :44 | <u>Fuel RTG</u> | P 2.0 |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Retrieve cask lanyard. | P 2.1 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:05:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|-------------------------------------|---------------------------|--|----------|
| | | 00:05 :00 | Walk 11 feet from cask. | P 2.2 |
| C3.12 | Return to pkg 2. | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| C3.13 | Remove Dome Removal Tool (DRT). | :10 | Pull cask lanyard to rotate levers and remove spline. | P 2.3 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| C3.14 | Remove Fuel Transfer Tool (FTT). | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C3.15 | Walk to Fuel Cask with DRT and FTT. | :30 | Continue pulling cask lanyard until cask is rotated to correct fuel transfer attitude and discard lanyard. | P 2.4 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| C3.16 | Hand DRT and FTT to LMP. | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Receive DRT and FTT from CDR. | P 2.5 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:06 :00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|---|----------|
| C3.17 | Return to pkg 2. | 00:06:00 | Temporarily stow FTT on LM foot pad or SEQ bay until needed. | P 2.6 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| C3.18 | Use stowed UHT to rotate pkg 2 to the fueling position. | :10 | Mate DRT with dome locking mechanism, pull outward, press inward and rotate dome locking mechanism clockwise. | P 2.7 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| C3.19 | Pull RTG dust cover pull ring to remove dust cover and discard. | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| C3.20 | Walk to ALSD stowage area. | :34 | Remove dome, read tempilabel, report and discard DRT/dome. | P 2.8 |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:07:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---------------------|---------------------------|--|----------|
| C4.0 | <u>Offload ALSD</u> | 00:07:00 | Retrieve FTT from temporary stowage. | P 2.9 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Insert FTT fingers into fuel capsule head. | P 2.10 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Engage FTT fingers in fuel capsule head | P 2.11 |
| | | :22 | by rotating knob clockwise. | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | Withdraw fuel capsule from fuel cask. | P 2.12 |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | Walk to pkg 2. | P 2.13 |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | Lower fuel capsule into RTG. | P 2.14 |
| | | :58 | | |
| | | 00:08:00 | | |

| Task No. | Commander Activity | ALP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|-------------------------|---|----------|
| | | 00:08:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | Report RTG fueled. | P 2.15 |
| | | :18 | | |
| | | :20 | Disengage FTT from fuel capsule by | P 2.16 |
| | | :22 | counter-rotation of knob, read tempilabel | |
| | | :24 | and report. | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | Discard FTT. | P 2.17 |
| | | :58 | | |
| | | 00:09:00 | | |

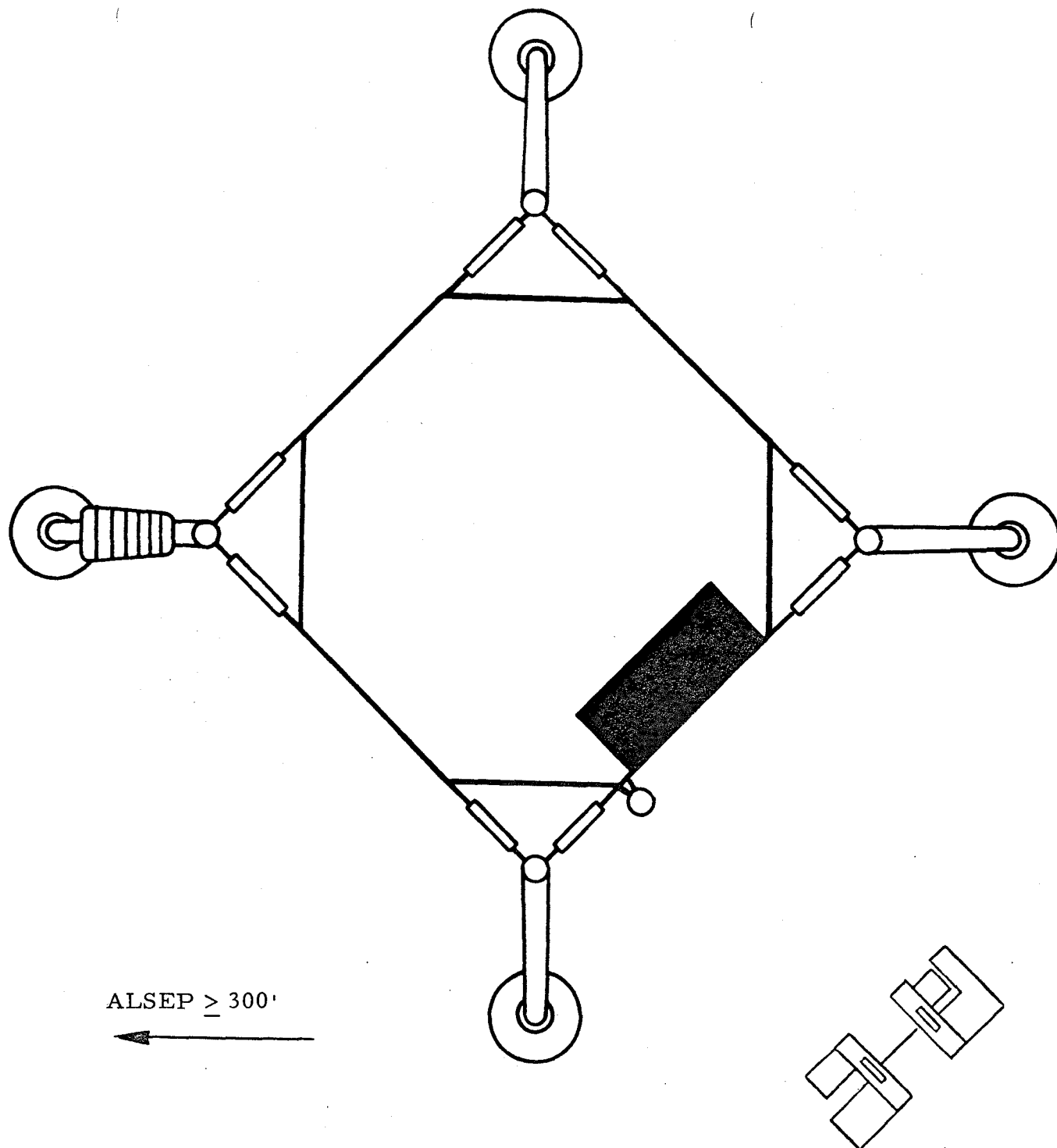


Figure 3 Prepare for Traverse

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:09:00 | <u>Configure ALSEP for Traverse</u> | P 3.0 |
| | | :02 | Use UHT to rotate pkg 2 to the carry position. | P 3.1 |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Relocate pkg 2 near pkg 1. | P 3.2 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Install carry bar in fitting on pkg 2. | P 3.3 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Grasp carry bar handles by back hands and rotate in direction of carry. | P 3.4 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:10:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---|----------------------------|----------|
| C5.0 | <u>LRV Traverse to Deployment Site</u> (Site Survey) 00:10:00 Traverse Time 00:20:00 | 00:10:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 00:11:00 | <u>Close SEQ Bay Doors</u> | P 4.0 |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:11:00 | <u>ALSEP Traverse</u> | P 5.0 |
| | | :02 | Grasp carry bar handles and lift ALSEP | P 5.1 |
| | | :04 | pkgs. | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Start traverse toward deployment site. | P 5.2 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | 00:11:30 | |
| | | :48 | Traverse Time | |
| | | :50 | 00:21:00 | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:12:00 | | |

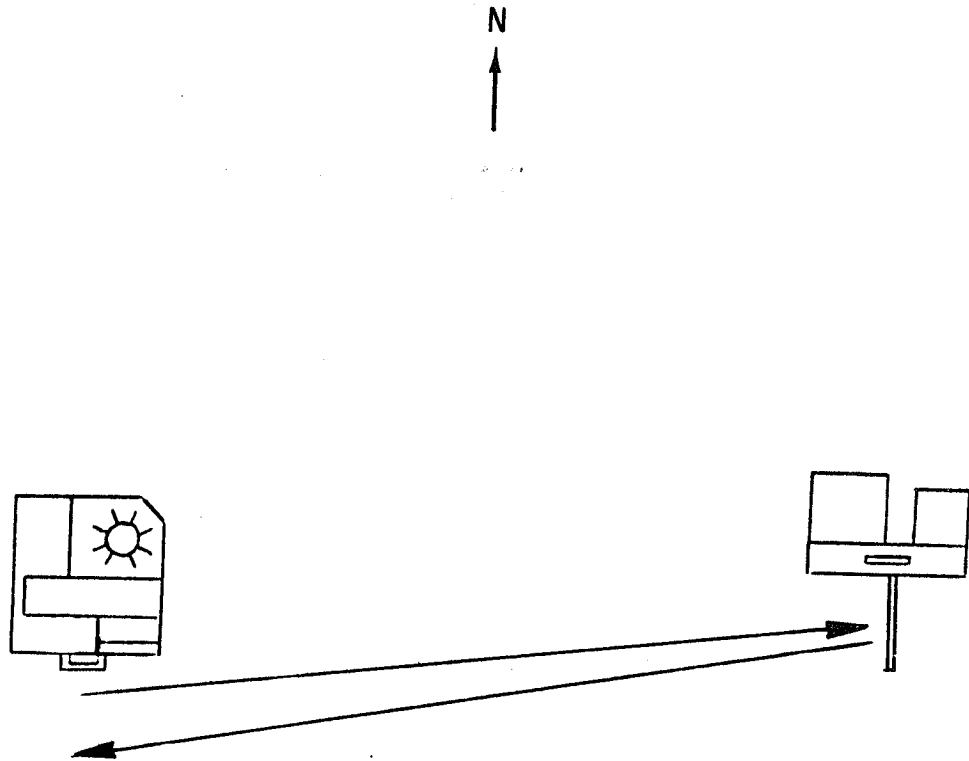


Figure 4 Position Packages at
Deployment Site

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:21:00 | <u>Position ALSEP at Site</u> | P 6.0 |
| | | :02 | Lower ALSEP pkgs to lunar surface. | P 6.1 |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Push carry bar release button #2 and | P 6.2 |
| | | :12 | disengage carry bar from pkg 2. | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | Lift pkg 1, walk 10 feet east of pkg 2 on | P 6.3 |
| | | :36 | E-W axis and lower pkg 1 to lunar surface. | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:22:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:22:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | Disengage UHT from pkg 1 temporary stowage socket. | P 6.4 |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | Pass UHT to CDR. | P 6.5 |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | Return to pkg 2. | P 6.6 |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | <u>Remove HFE & LEAM Pull Pins</u> | P 7.0 |
| | | :36 | Release first velcroed HFE subpallet pull ring on right side of pkg. 2. | P 7.1 |
| | | :38 | | |
| | | :40 | Use pull ring to remove the first HFE subpallet pull pin and discard. | P 7.2 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Release second velcroed HFE Astromate pull ring. | P 7.3 |
| | | :52 | | |
| | | :54 | Use pull ring to remove HFE Astromate pull ring and second HFE subpallet pull pin and discard. | P 7.4 |
| | | :56 | | |
| | | :58 | | |
| | | 00:23:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:23:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | Remove LEAM Subpallet pull pin on left side of pkg 2 and discard. | P 7.5 |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | <u>Rotate Pkg. #2</u> | P 8.0 |
| | | :26 | Use stowed UHT to rotate Pkg 2 to the deployed position on E-W axis. | P 8.1 |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | Disengage UHT from pkg 2 temporary stowage socket. | P 8.2 |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | Tether UHT to EMU. | P 8.3 |
| | | :56 | | |
| | | :58 | | |
| | | 00:24:00 | | |

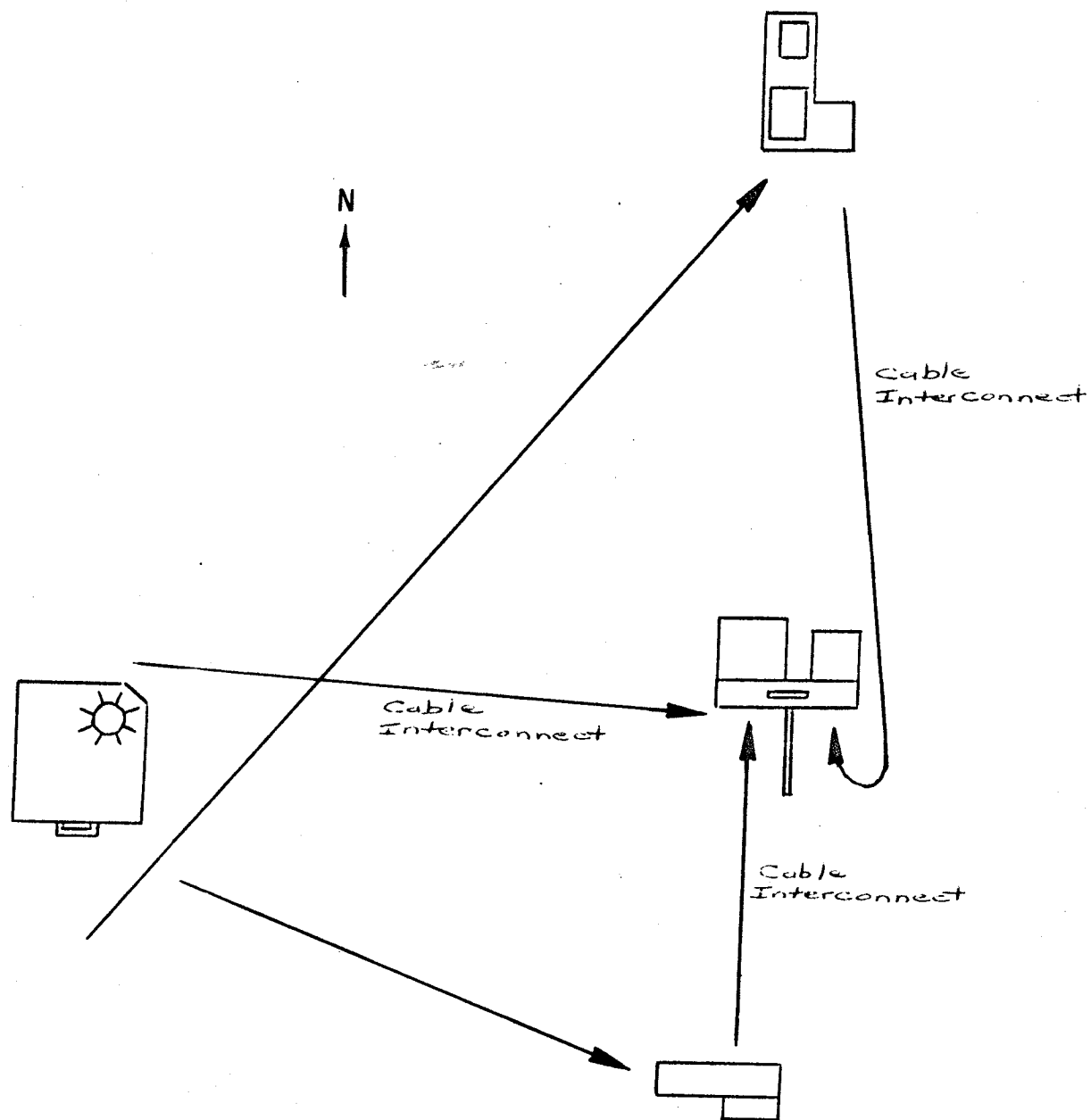
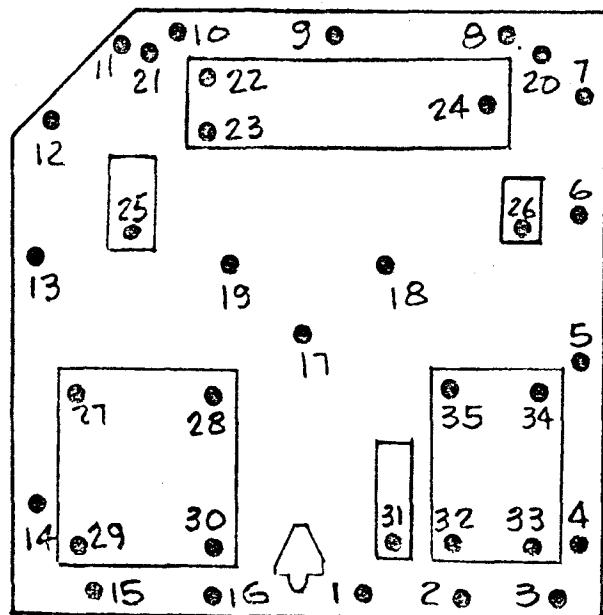
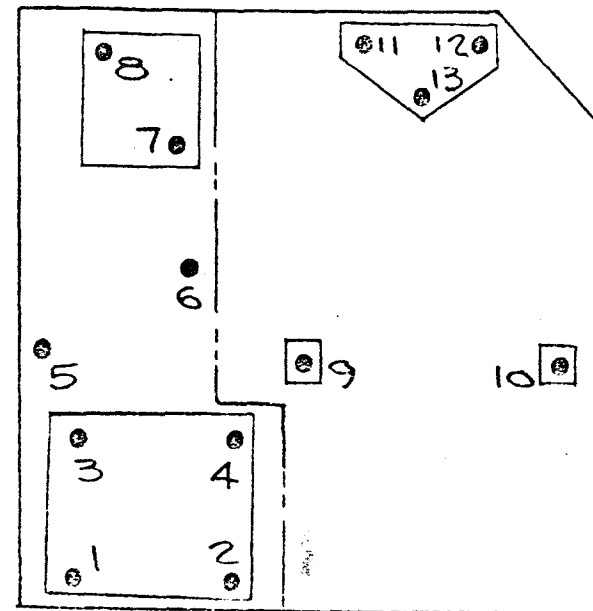


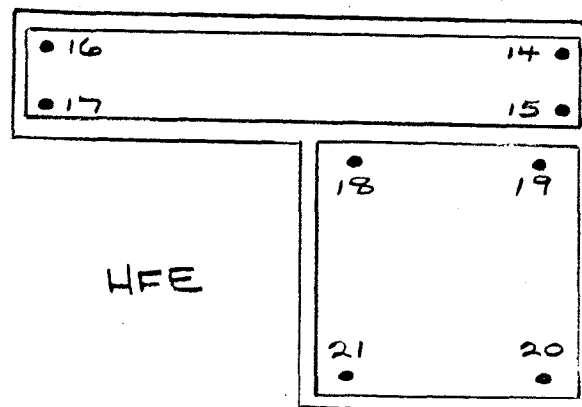
Figure 5 Offload Subpallets/Interconnect to Central Station



SUB PACKAGE No.1



SUB PACKAGE No.2



HFE

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|-------------------|----------|
| C6.0 | <u>Offload HFE Subpallet</u> | 00:24 :00 | | |
| C6.1 | Release velcroed HFE subpallet carry handle and lock in position. | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| C6.2 | Unstow UHT. | :10 | | |
| | | :12 | | |
| | | :14 | | |
| C6.3 | Use UHT to release the two strut boyd bolts on HFE subpallet. | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| C6.4 | Stow UHT. | :36 | | |
| | | :38 | | |
| C6.5 | Grasp the HFE Subpallet carry handle and lift the HFE subpallet from pkg 2. | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| C7.0 | <u>HFE Connect</u> | :48 | | |
| C7.1 | Grasp HFE Astromate handle and remove Astromate connector from its stowage assembly. | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:25 :00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|--|----------|
| C7.2 | Verify HFE cable reel deployment and ensure that sufficient HFE cable is deployed for connection to central station. | 00:25:00 | <u>Offload LEAM Subpallet</u> | P 9.0 |
| | | :02 | Unstow UHT | P 9.1 |
| | | :04 | Use UHT to release two boyd bolts securing LEAM Subpallet to pkg 2. | P 9.2 |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Engage UHT in LEAM subpallet carry socket. | P 9.3 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| C7.3 | Using HFE subpallet carry handle lower HFE subpallet to lunar surface so that it rests on its legs. | :32 | Use UHT to remove LEAM subpallet from Pkg. 2 (lift slightly up and move subpallet out toward front of Pkg.). | P 9.4 |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| C7.4 | Walk to central station with HFE Astromate connector deploying cable. | :44 | Walk 14 feet Northeast (5 to 10 feet North of Central station) with LEAM subpallet using UHT. | P 9.5 |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:26:00 | | |

| Task No. | Commander Activity | AL / E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|--------------------------|---|----------|
| C7.5 | Remove central station connector dust cover and discard. | 00:26 :00 | | |
| | | :02 | <u>LEAM Connect</u> | P10.0 |
| | | :04 | Remove LEAM astromate connector pull | P10.1 |
| | | :06 | pin which secures connector to LEAM | |
| | | :08 | subpallet and discard pull pin. | |
| C7.6 | Remove HFE astromate connector dust cover and discard. | :10 | | |
| | | :12 | | |
| | | :14 | Grasp LEAM astromate handle and remove | P10.2 |
| | | :16 | astromate connector from LEAM subpallet | |
| | | :18 | while supporting subpallet with UHT. | |
| C7.7 | Ensure the locking lever is fully CCW and mate HFE astromate connector to central station. | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | Verify LEAM cable reel deployment and | P10.3 |
| | | :36 | ensure that sufficient LEAM cable is | |
| | | :38 | deployed for connection to central station. | |
| C7.8 | Press down on astromate handle and rotate locking lever CW 45° to lock position. | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | Using UHT, cover LEAM subpallet to lunar | P10.4 |
| | | :56 | surface. | |
| | | :58 | | |
| | | 00:27 :00 | | |

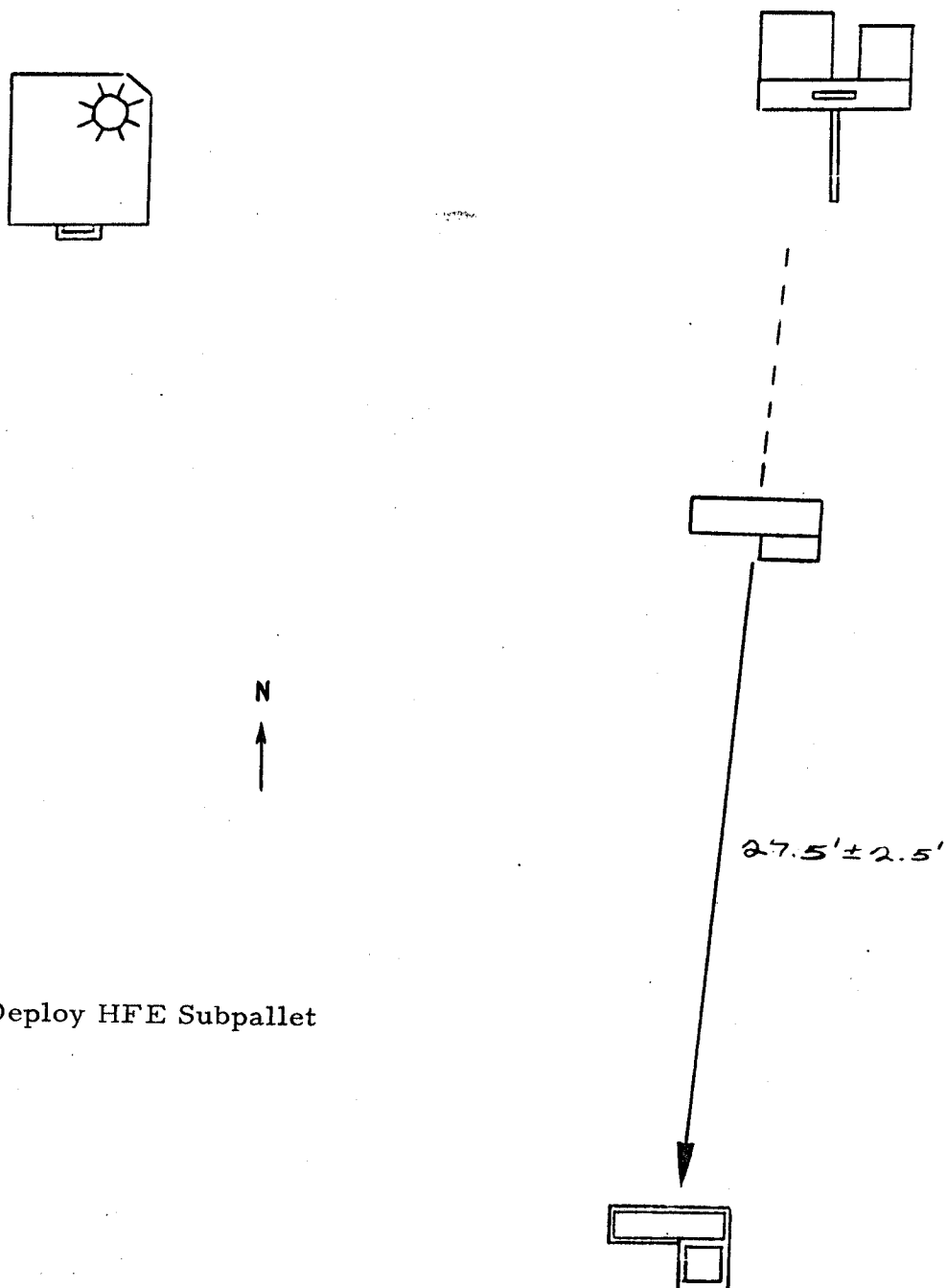


Figure 6 Deploy HFE Subpallet

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|---|----------|
| C7.9 | Return to HFE Subpallet | 00:27:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | Disengage UHT from LEAM subpallet carry socket. | P10.5 |
| C8.0 | <u>HFE Subpallet Deploy</u> | :08 | | |
| C8.1 | Grasp HFE subpallet carry handle and lift the HFE subpallet from the lunar surface. | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | Stow UHT. | P10.6 |
| | | :18 | | |
| C8.2 | Walk with HFE subpallet 30 feet south from central station. | :20 | Walk to central station with LEAM astromate connector deploying cable. | P 10.7 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Remove central station connector dust cover and discard. | P10.8 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Remove LEAM astromate connector dust cover and discard. | P10.9 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| C8.3 | Collapse HFE subpallet strut support assembly against the back of the subpallet. | :50 | Ensure locking lever is fully CCW and mate LEAM astromate connector to central station. | P10.10 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:28:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|--|--|--------------------|
| C8.4 | Lower HFE subpallet to lunar surface so that it rests on its legs. | 00:28:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 | Press down on astromate handle and rotate locking lever CW 45° to lock position. | P10.11 |
| C8.5 | Unstow UHT. | :30 :32 :34 | Return to pkg 2. | P10.12 |
| C8.6 | Hook UHT handle into HFE subpallet carry handle and rotate the HFE subpallet to lunar surface so that the HFE probe pkg and electronics pkg are positioned upward. | :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 | <u>Deploy RTG Power Cable</u> Read tempilabel on RTG cable reel and report. | P11.0 P11.1 |
| C8.7 | Disengage UHT handle from HFE subpallet carry handle. | :56 :58 00:29:00 | Unstow UHT. Use UHT to release three boyd bolts on RTG cable reel. | P11.2 P11.3 |

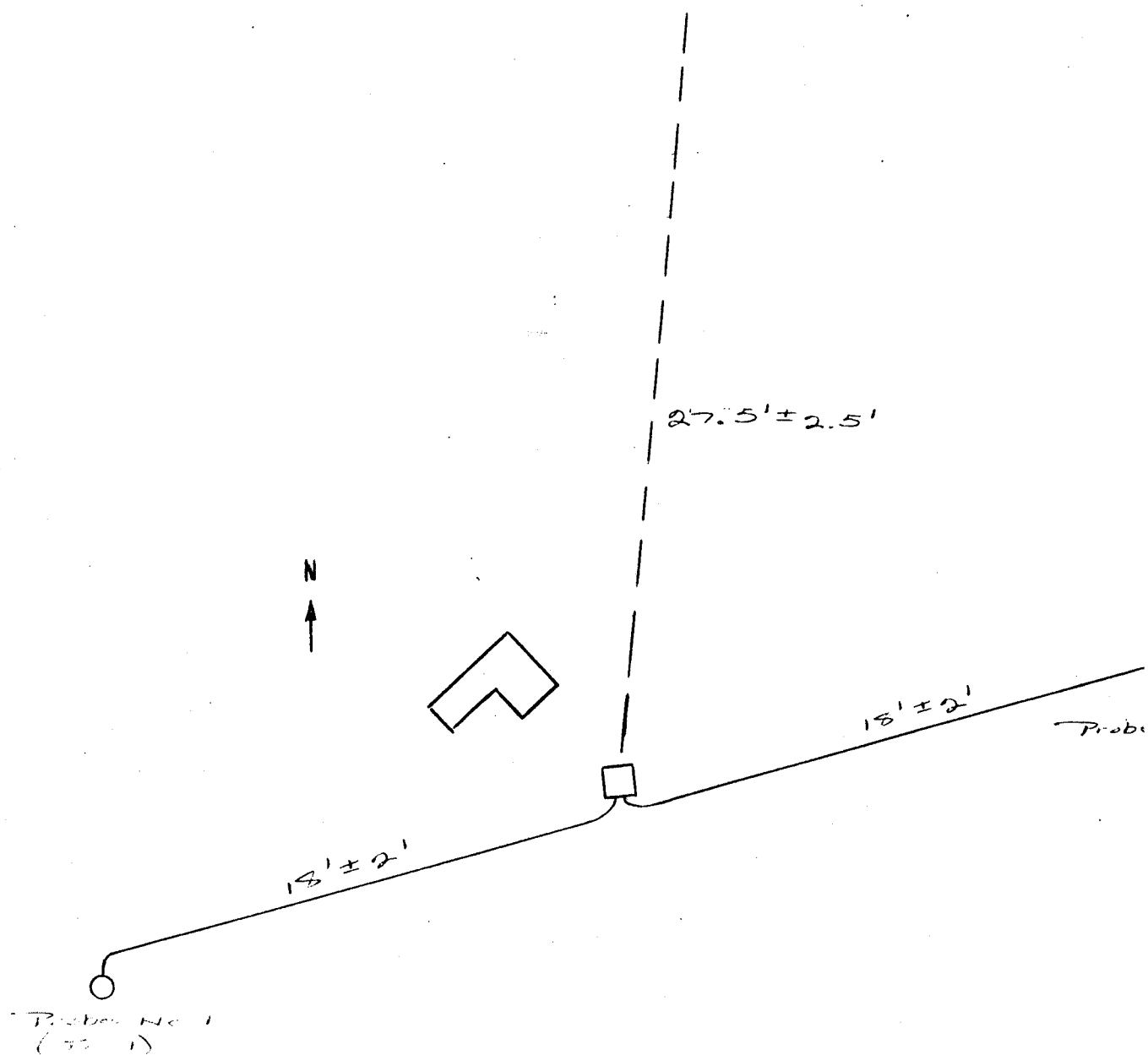


Figure 7 Deploy HFE Probes/Electronics

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|--|----------|
| C9.0 | <u>Offload HFE Probe Pkgs</u> | 00:29:00 | | |
| C9.1 | Use UHT to release four boyd bolts on HFE probe pkg. | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | Engage UHT in RTG cable reel carry socket. | P11.4 |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | Use UHT to remove RTG cable reel from Pkg 2 and walk to central station deploying power cable. | P11.5 |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| C9.2 | Use UHT handle to hook HFE probe pkg handle. | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| C9.3 | With UHT remove the HFE Probe pkgs. from the HFE subpallet. | :54 | Remove shorting plug pull pin and discard. | P11.6 |
| | | :56 | | |
| | | :58 | | |
| | | 00:30:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|--|----------|
| | | 00:30:00 | | |
| C9.4 | Grasp the HFE probe pkg handle. | :02 | | |
| | | :04 | Remove shorting plug bracket and discard. | P11.7 |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C9.5 | Disengage UHT handle from HFE probe pkg handle. | :14 | Grasp shorting plug assembly and remove from stowage. | P11.8 |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| C9.6 | Stow UHT. | :24 | Disengage UHT from RTG cable reel and discard cable reel. | P11.9 |
| C10.0 | <u>Separate Probe Pkgs.</u> | :26 | | |
| C10.1 | Remove first velcroed closure strap and discard. | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | Stow UHT. | P11.10 |
| | | :36 | | |
| | | :38 | <u>RTG Connect</u> | P12.0 |
| | | :40 | Read ammeter to verify that the reading is greater than zero and report. | P12.1 |
| | | :42 | | |
| C10.2 | Support HFE Probe pkg, remove second velcroed closure strap and discard. | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Remove central station connector dust cover and discard. | P12.2 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:31:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------------|---|---|--|---------------------------------|
| C10.3 | Use HFE probe pkg handles to separate the two halves of the probe pkg. | 00:31:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 | Remove shorting switch assembly dust cover and discard. | P12.3 |
| C10.4 | LEAM unmarked half of HFE probe package against HFE subpallet. | :24 :26 :28 | Mate RTG power cable to central station (rotate handle 90° CW to lock). | P12.4 |
| C11.0 C11.1 | <u>Locate First Bore Hole Site</u> Grasp pull ring and rotate emplacement tool holding device from its stowed position and velcro the holding device to the bottom of the probe pkg. | :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 00:32:00 | Actuate shorting switch assembly (ON position). Read ammeter to verify that the reading is zero and report. Return shorting switch assembly to SHORT position. | P12.5 P12.6 P12.7 |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|--|--|----------|
| C11.2 | Grasp HFE probe pkg carry strap. | 00:32:00 :02 :04 :06 :08 :10 :12 | <u>Traverse Gravimeter Experiment (TGE)</u> <u>Read</u> | P13.0 |
| C11.3 | Walk 18 feet SW of the HFE electronics pkg to the first bore hole site, deploying probe cable. | :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 | | |
| C11.4 | Lower HFE probe pkg to lunar surface, open face downward. | :34 :36 :38 :40 :42 | | |
| C11.5 | Return to HFE subpallet. | :44 :46 :48 :50 :52 :54 :56 :58 | | |
| | | 00:33:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|-------------------|----------|
| | | 00:33:00 | | |
| C12.0 | <u>Locate Second Bore Hole Site</u> | :02 | | |
| C12.1 | Grasp HFE probe pkg handle and retrieve unmarked half of HFE probe pkg from HFE subpallet. | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C12.2 | Grasp HFE probe pkg carry strap. | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| C12.3 | Walk 18 feet NE of the HFE Electronics pkg to the second bore hole site, deploying probe cable. | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| C12.4 | Lower HFE probe pkg to lunar surface, open face downward. | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| C12.5 | Walk to LRV to retrieve ALSD. | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:34:00 | | |

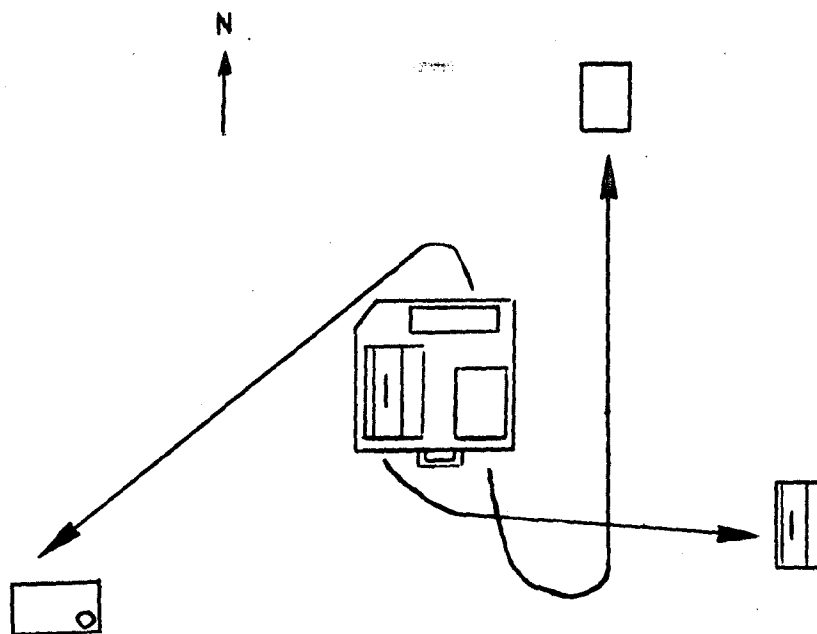


Figure 8 Emplace Package 1/Offload
LSG, LSPE, LMS

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:34:00 | <u>Disconnect Carry Bar from Pkg.</u> | P14.0 |
| | | :02 | Push carry bar release button #1 and | P14.1 |
| | | :04 | disengage carry bar from pkg 1. | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| C13.0 | <u>ALSD Set-Up</u> | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C13.1 | Assemble drill. | :30 | Discard carry bar. | P14.2 |
| | | :32 | | |
| | | :34 | <u>Emplace Pkg 1</u> | P15.0 |
| | | :36 | Untether UHT from EMU and engage in | P15.1 |
| | | :38 | package 1 temporary stowage socket. | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | Release velcroed pull ring in center of | P15.2 |
| | | :58 | Pkg 1, pull up and attach velcroed pull | |
| | | 00:35:00 | ring on top of cover. | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:35:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | Release velcroed pull ring on right side of pkg 1. | P15.3 |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | Use stowed UHT as a handle to rotate pkg 1 to the deployed position and rough align on E-W axis. | P15.4 |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | Disengage UHT from pkg 1 temporary stowage socket. | P15.5 |
| | | :56 | | |
| | | :58 | | |
| | | 00:36:00 | | |

Task
No.Commander
ActivityALSEP/E
Time
(Cumulative)LM Pilot
ActivityTask
No.

00:36:00

:02

:04

:06

:08

:10

:12

:14

:16

:18

:20

:22

:24

:26

:28

:30

:32

:34

:36

:38

:40

:42

:44

:46

:48

:50

:52

:54

:56

:58

00:37:00

Hook UHT handle in the dust cover pull
ring and pull to release dust cover.

P15.4

Disengage UHT handle from dust cover
pull ring and discard dust cover.

P15.5

Tether UHT to EMU.

P15.6

Offload LSG
Unstow UHT

P16.0

P16.1

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:37:00 | Use UHT to release four boyd bolts securing LSG to pkg 1. | P16.2 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Engage UHT in LSG carry socket. | P16.3 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Use UHT to remove LSG from pkg 1. | P16.4 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:38:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:38:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Emplace LSG on lunar surface near direction of traverse. | P16.5 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Disengage UHT from LSG carry socket. | P16.6 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Stow UHT. | P16.7 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | Return to pkg 1. | P16.8 |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | <u>Offload LSPE Geophone Module</u> | P17.0 |
| | | :56 | Unstow UHT. | P17.1 |
| | | :58 | | |
| | | 00:39:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:39:00 | Use UHT to release four boyd bolts securing the LSPE geophone module to pkg 1 and securing the cover to the geophone module. | P17.2 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Engage UHT in geophone module carry socket. | P17.3 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Use UHT to remove geophone module from pkg. 1. | P17.4 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:40:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|---|----------|
| C13.2 | Carry drill and bore stem rack to first bore hole site. | 00:40:00 | Verify cable reel release from bottom of geophone module. | P17.5 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Emplace LSPE geophone module on lunar surface near direction of traverse. | P17.6 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Dusengage UHT from LSPE geophone module carry socket. | P17.7 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Stow UHT. | P17.8 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | Return to pkg 1. | P17.9 |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | <u>Offload LMS</u> | P18.0 |
| | | :56 | Unstow UHT. | P18.1 |
| | | :58 | | |
| | | 00:41:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|--|----------|
| C13.3 | Place drill and bore stem rack on lunar surface. | 00:41:00 | Engage UHT handle in LMS vent pull ring. | P18.2 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Release LMS vent pull ring. | P18.3 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Pull LMS vent lanyard upward to open LMS vent. | P18.4 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Disengage UHT handle from LMS vent pull ring. | P18.5 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Release the three boyd bolts securing the LMS to pkg. 1. | P18.6 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:42:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|------------------------------|---------------------------|---|----------|
| C14.0 | <u>Drill First Bore Hole</u> | 00:42:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Engage UHT in LMS swivel socket. | P18.7 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Use UHT to remove LMS from pkg 1. | P18.8 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | Rotate LMS 90° using swivel socket and insure that swivel socket is locked. | P18.9 |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Emplace LMS on lunar surface near direction of traverse. | P18.10 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:43:00 | | |

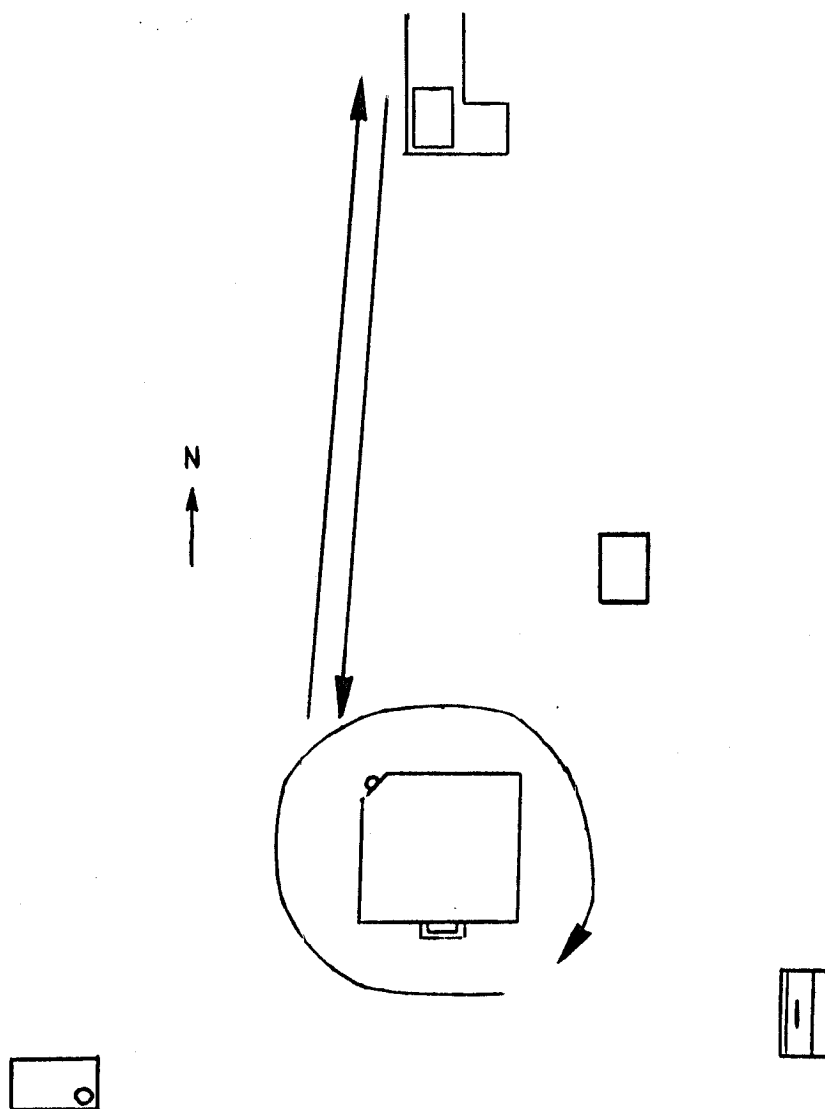


Figure 9 Deploy Central Station

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:43 :00 | Disengage UHT from LMS carry socket. | P18.11 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Stow UHT. | P18.12 |
| | | :12 | | |
| | | :14 | Return to pkg 1. | P18.13 |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | <u>Release Central Station Sunshield</u> | P19.0 |
| | | :24 | | |
| | | :26 | Unstow UHT. | P19.1 |
| | | :28 | | |
| | | :30 | Engage UHT in pkg 1, temporary stowage | P19.2 |
| | | :32 | socket. | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Observing bubble level and sun compass, | P19.3 |
| | | :42 | use UHT to level and align central station. | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:44 :00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---------------------------------------|----------|
| | | 00:44:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Disengage UHT from Pkg 1. | P19.4 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Use UHT to release five boyd bolts on | P19.5 |
| | | :22 | South side of central station. | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:45:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:45 :00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Use UHT to release the first two boyd bolts on west side of central station. | P19.6 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Use UHT to release one boyd bolt on antenna (northwest corner of sunshield). | P19.7 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Stow UHT. | P19.8 |
| | | :42 | | |
| | | :44 | Grasp antenna mast pull ring, pull to release antenna mast sections and discard pull ring. | P19.9 |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:46 :00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:46:00 | Grasp the top of the antenna mast and pull upward until all sections are locked and fully extended. | P19.10 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Grasp antenna support pull ring, pull to release antenna mast support and discard pull ring. | P19.11 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | Unstow UHT. | P19.12 |
| | | :48 | | |
| | | :50 | Using UHT handle, rotate antenna support bracket off of antenna, remove bracket and discard. | P19.13 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:47:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:47:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | Use UHT to release the remaining two boyd bolts on the west side of central station. | P19.14 |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | Use UHT to release the two boyd bolts on PDM cover. | P19.15 |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | Engage UHT into PDM cover socket. | P19.16 |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | With UHT remove PDM cover from pkg 1. | P19.17 |
| | | :56 | | |
| | | :58 | | |
| | | 00:48:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 00:48:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | Disengage UHT from PDM cover socket and discard cover. | P19.18 |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Use UHT to lower rear curtain to lunar surface. | P19.19 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Engage UHT in antenna cable restraint socket and separate it from sunshield. | P19.20 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Pull lanyard to release cable restraint and to deploy cable. | P19.21 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | Use UHT to release three boyd bolts on north side of central station. | P19.22 |
| | | :56 | | |
| | | :58 | | |
| | | 00:49:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:49:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | Use UHT to release other boyd bolt on antenna. | P19.23 |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | Use UHT to release four boyd bolts on east side of central station. | P19.24 |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:50:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:50:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | Use UHT to release boyd bolt on the LSPE Remote antenna. | P19.25 |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | Check for release of sunshield from primary structure and ensure all cables are clear of sunshield. | P19.26 |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | Walk to north side of central station. | P19.27 |
| | | :38 | | |
| | | :40 | Use UHT to release the two northmost, interior sunshield boydbolts. | P19.28 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:51:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:51:00 | Use UHT to release center boydbolt. | P19.29 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | <u>Deploy Central Station Sunshield</u> | P20.0 |
| | | :10 | Use UHT to control sunshield deployment | P20.1 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Remove UHT from center guide cup. | P20.2 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Stow UHT. | P20.3 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | Complete sunshield deployment, using manual assist. | P20.4 |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:52:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|--|-------------|
| | | 00:52:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | Check for proper deployment of side curtains, remove three sunshield covers and discard. | P20.5 |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Unstow UHT. | P20.6 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | Use UHT to attach rear and front of right side curtain to central station. | P20.7 |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:53:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:53:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | Use UHT to attach front of left side curtain to central station. | P20.8 |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Use UHT to attach rear thermal curtain to side curtains. | P20.9 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | Observing sun compass and bubble level, check alignment and leveling. | P20.10 |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | Stow UHT. | P20.11 |
| | | :56 | | |
| | | :58 | | |
| | | 00:54:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---|--|----------|
| C15.0 | <u>Emplace First Probe</u> | 00:54:00 | <u>Deploy Aiming Mechanism</u> | P21.0 |
| C15.1 | Unstow UHT. | :02 | <u>Walk to LEAM Subpallet</u> | P21.1 |
| C15.2 | Use UHT handle to hook carry handle of marked half of HFE probe pkg. | :04 :06 :08 :10 :12 | Unstow UHT. | P21.2 |
| C15.3 | Use UHT to lift the HFE probe pkg from lunar surface. | :14 :16 :18 :20 :22 | Use UHT to release the two boyd bolts on aiming mechanism housing. | P21.3 |
| C15.4 | Grasp HFE probe pkg carry strap. | :24 :26 :28 :30 :32 | | |
| C15.5 | Disengage UHT handle from HFE probe pkg carry handle. | :34 :36 :38 :40 :42 | Use UHT handle to hook carry handle and to remove aiming mechanism housing from subpallet. | P21.4 |
| C15.6 | Stow UHT. | :44 :46 :48 | | |
| C15.7 | Remove remainder of probe cable from HFE probe pkg. | :50 :52 :54 :56 :58 00:55:00 | Grasp Aiming Mechanism carry handle and Release UHT from carry handle. | P21.5 |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|--|----------|
| C15.8 | Use pull ring to rotate sleeve containing probe forward and to remove probe assembly from sleeve. | 00:55:00 | | |
| | | :02 | | |
| | | :04 | Stow UHT. | P21.6 |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Return to central station with aiming mechanism | P21.7 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Release pull ring and pull lanyard to remove dust cover from aiming mechanism housing and discard lanyard/dust cover assy. | P21.8 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C15.9 | Lower HFE probe package to lunar surface. | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| C15.10 | Grasp probe assy. | :40 | Install aiming mechanism housing on antenna mast, observing orientation decal. | P21.9 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| C15.11 | Remove sail cloth retaining first probe end piece and discard sail cloth. | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | Remove retainer pin securing aiming mechanism and remove housing and foam packaging and discard housing and packaging. | P21.8 |
| | | :58 | | |
| | | 00:56:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|---|----------|
| C15.12 | Remove sail cloth retaining second probe end piece and discard sail cloth. | 00:56 :00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| C15.13 | Position lower sunshield over spring on upper probe section. | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C15.14 | Unfold probe assembly | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| C15.15 | Insert probe into bore hole. | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | Rotate antenna tie-down bracket , retrieve antenna and install on aiming mechanism. | P21.9 |
| | | :58 | | |
| | | 00:57:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|--|----------|
| C15.16 | Unstow UHT. | 00:57:00 | | |
| | | :02 | | |
| C15.17 | Use UHT handle to hook HFE probe pkg. carry handle. | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C15.18 | Use UHT to lift the HFE probe pkg. from lunar surface. | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| C15.19 | Grasp HFE probe package carry strap. | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| C15.20 | Disengage UHT handle from HFE probe package carry handle. | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| C15.21 | Stow UHT. | :44 | | |
| | | :46 | | |
| | | :48 | | |
| C15.22 | Remove emplacement tool from its holding device by pulling on "Crow's Foot". | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | Observing bubble levels, adjust leveling adjustment knobs. | P21.10 |
| | | :58 | | |
| | | 00:58:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|-------------------|----------|
| C15.23 | Discard HFE probe package. | 00:58:00 | | |
| | | :02 | | |
| C15.24 | Extend emplacement tool to maximum length and verify full extension. | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| C15.25 | Place emplacement tool "Crow's Foot" between lower and upper sunshield. | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| C15.26 | Use emplacement tool to complete emplacement of probe in bore hole. | :56 | | |
| | | :58 | | |
| | | 00:59:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|--|----------|
| | | 00:59 :00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| C15.27 | Observe emplacement tool marking and report. | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| C15.28 | Remove emplacement tool from bore hole. | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:00:00 | | |
| | | | Observing sun compass, adjust the shadow adjustment knob (match gnomon shadow to reference). | P21.11 |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|-------------------|----------|
| | | 01:00 :00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C15.29 | Use emplacement tool "Crow's Foot" to retrieve probe cable near upper sunshield. | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| C15.30 | Place emplacement tool "Crow's Foot" around probe cable on far side of upper sunshield. | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| C15.31 | Use emplacement tool to slide upper sunshield along probe cable and toward probe assembly. | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| C15.32 | Use emplacement tool to ensure upper sunshield is fully deployed over bore hole. | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | Unstow UHT. | P21.12 |
| | | :58 | | |
| | | 01:01:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|--|----------|
| C15.33 | Remove emplacement tool "Crow's Foot" from probe cable. | 01:01:00 | <u>Activate Central Station</u> | P22.0 |
| | | :02 | Use UHT to activate shorting switch assembly and verify that ammeter indicates a load condition. | P22.1 |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C15.34 | Lower probe cable to lunar surface. | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Stow UHT | P22.2 |
| | | :22 | | |
| | | :24 | | |
| C15.35 | Pick up bore stem rack and drill from lunar surface. | :26 | Request transmitter turn-on. | P22.3 |
| | | :28 | | |
| | | :30 | Verify downlink (receive confirmation of receipt of RF signal and useful data. | P22.4 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:02:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|---------------------------|---|---|-------------|
| C16.0 | <u>Transfer Equipment</u> | 01:02:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 01:03:00 | (Help CDR transfer equipment to second bore hole site) | |

Task
No.

Commander
Activity

ALSEP/E
Time
(Cumulative)

LM Pilot
Activity

Task
No.

01:03:00

:02

:04

:06

:08

:10

:12

:14

:16

:18

:20

:22

:24

:26

:28

:30

:32

:34

:36

:38

:40

:42

:44

:46

:48

:50

:52

:54

:56

:58

01:04:00

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|-------------------------------|---|---|----------|
| C17.0 | <u>Drill Second Bore Hole</u> | 01:04:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 01:05:00 | 1. Continue to assist CDR, A.R. 2. Perform terrain survey for ALSEP experiment deployment locations (LSPE) to ensure science geometry is acceptable. | |

Task
No.

Commander
Activity

ALSEP/E
Time
(Cumulative)

LM Pilot
Activity

Task
No.

01:05:00

:02

:04

:06

:08

:10

:12

:14

:16

:18

:20

:22

:24

:26

:28

:30

:32

:34

:36

:38

:40

:42

:44

:46

:48

:50

:52

:54

:56

:58

01:06:00

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---|----------------------|-------------|
| | | 01:06:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 01:07:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|--|----------------------|-------------|
| | | 01:07 :00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 01:08:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---|----------------------|-------------|
| | | 01:08:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 01:09:00 | | |

Task
No.

Commander
Activity

ALSEP/E
Time
(Cumulative)

LM Pilot
Activity

Task
No.

01:09 :00
:02
:04
:06
:08
:10
:12
:14
:16
:18
:20
:22
:24
:26
:28
:30
:32
:34
:36
:38
:40
:42
:44
:46
:48
:50
:52
:54
:56
:58
01:10:00

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|--|----------------------|-------------|
| | | 01:10 :00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 01:11:00 | | |

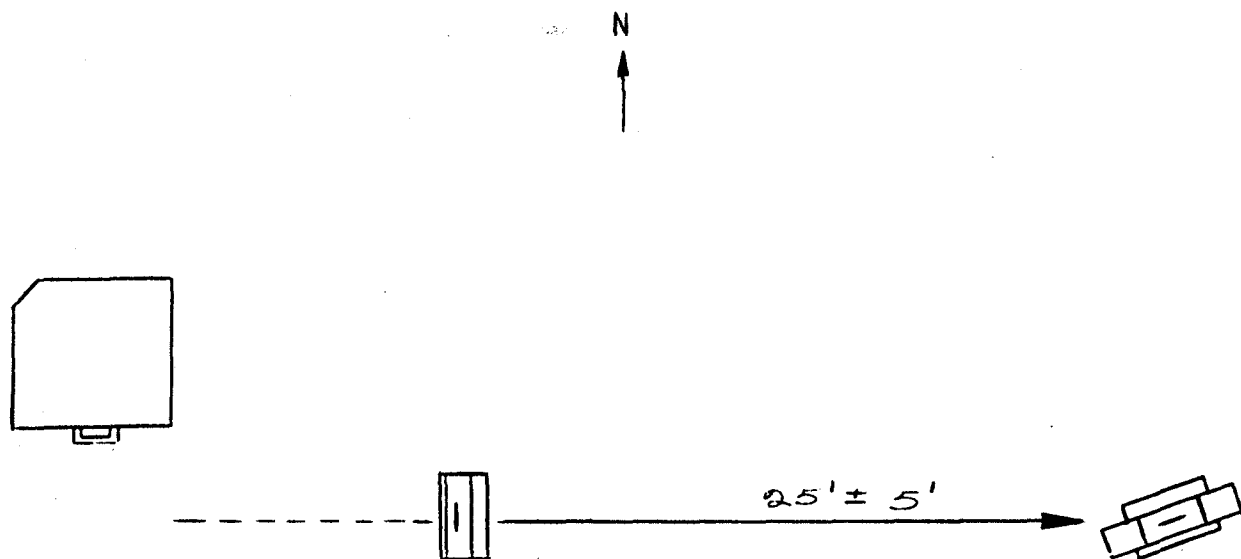


Figure 10 Deploy LSG

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 01:11 :00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | <u>Deploy LSG</u> | P23.0 |
| | | :28 | | |
| | | :30 | Unstow UHT. | P23.1 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | Engage UHT in LSG | P23.2 |
| | | :38 | Carry socket | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | Using UHT lift LSG from lunar surface | P23.3 |
| | | :48 | and carry to deployment site (25 feet east | |
| | | :50 | of central station. | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:12:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 01:12:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Emplace LSG on lunar surface using UHT | P23.4 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Extend LSG sunshade (pull upward on sunshade handle until sunshade locks in place). | P23.5 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Tilt LSG sunshade to appropriate angle (latitude dependent) using sunshade handle. | P23.6 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Align LSG $\pm 3^\circ$ to shadow line using UHT (align sunshade shadow with index marks). | P23.7 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:13:00 | | |

| Task No. | Commander Activity | AL E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---|---|-------------|
| | | 01:13 :00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 01:14 :00 | Level LSG $\pm 3^\circ$ (break bubble from edge of bubble level window) using UHT. | P23.8 |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 01:14:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Release LSG uncaging lanyard pull ring | P23.9 |
| | | :52 | from top of sunshade. | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:15:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 01:15 :00 | Uncage LSG (pull upward on pull ring/ lanyard). | P23. 10 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Remove UHT from LSG carry socket. | P23. 11 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Stow UHT. | P23. 12 |
| | | :22 | | |
| | | :24 | Verify LSG leveling and alignment. | P23. 13 |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | Walk to LEAM subpallet. | P23. 14 |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:16:00 | | |

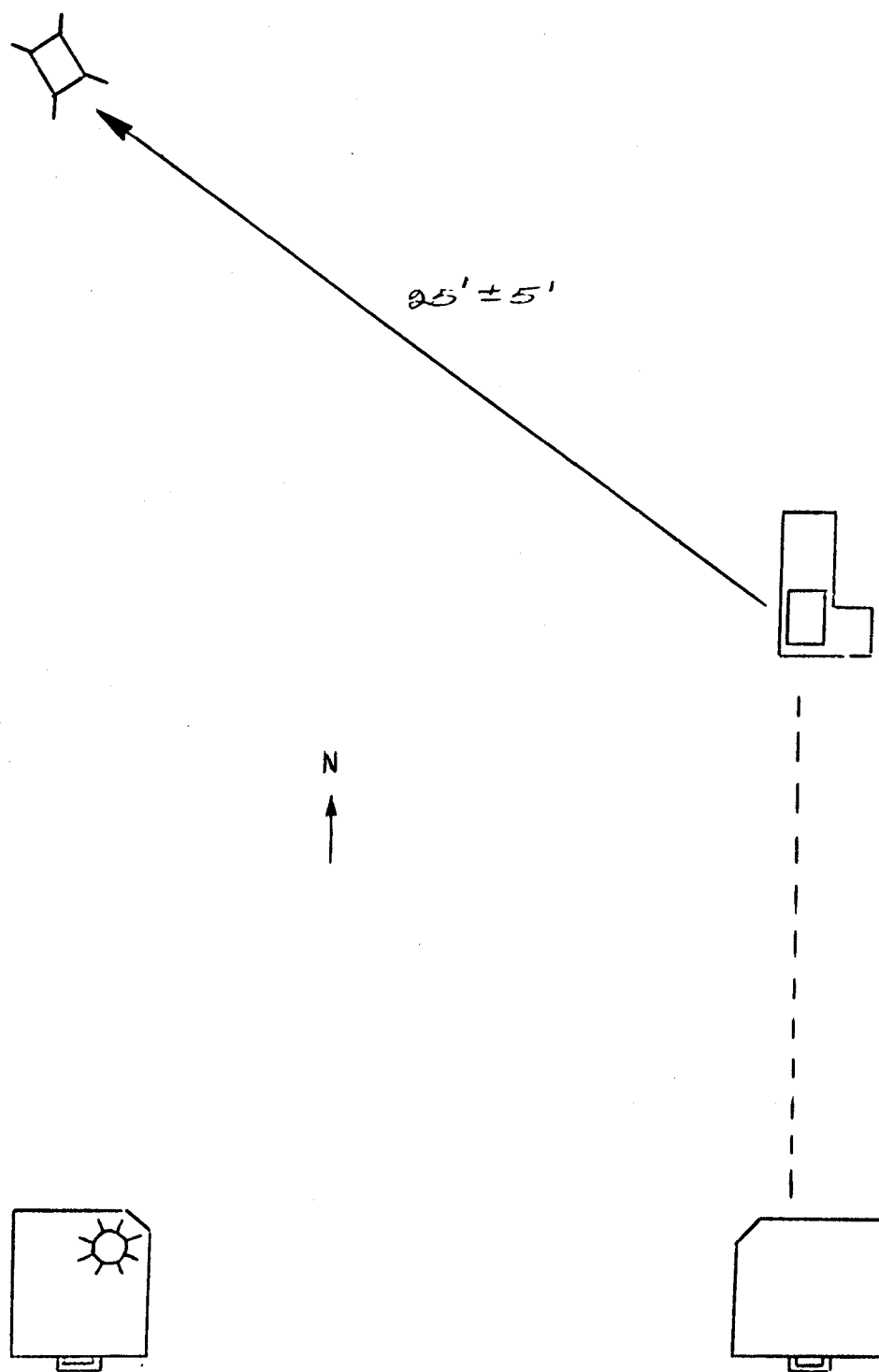


Figure 11 Deploy LEAM

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---|---|----------------|
| C18.0 | <u>Emplace Second Probe</u> | 01:16:00 | | |
| C18.1 | Unstow UHT. | :02 | | |
| C18.2 | Use UHT handle to hook HFE probe pkg carry handle. | :04 :06 :08 :10 :12 | | |
| C18.3 | Use UHT to lift the HFE probe pkg. from lunar surface. | :14 :16 :18 :20 | <u>Deploy LEAM</u> Unstow UHT. | P24.0 P24.1 |
| C18.4 | Grasp HFE probe pkg. carry strap. | :22 :24 :26 :28 :30 :32 :34 | Release four boydbolts securing LEAM to LEAM subpallet. | P24.2 |
| C18.5 | Disengage UHT handle from HFE probe pkg. carry handle. | :36 :38 :40 :42 :44 | | |
| C18.6 | Stow UHT. | :46 :48 | | |
| C18.7 | Remove remainder of probe cable from HFE probe pkg. | :50 :52 :54 :56 :58 01:17:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|---|----------|
| C18.8 | Use pull ring to rotate sleeve containing probe forward and to remove probe assy. from sleeve. | 01:17:00 | Engage UHT in LEAM swivel socket (UHT handle should be positioned over experiment). | P24.3 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Remove LEAM from subpallet using UHT. | P24.4 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Remove LEAM swivel socket pull pin and rotate experiment until swivel socket locks. | P24.5 |
| | | :22 | | |
| C18.9 | Discard HFE probe pkg. | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C18.10 | Grasp probe assy. | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| C18:11 | Remove sail cloth retaining first probe end piece and discard sail cloth. | :38 | | |
| | | :40 | Transfer LEAM to deployment site (25 feet northwest of central station) using UHT. | P24.6 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| C18:12 | Remove sail cloth retaining second probe end piece and discard sail cloth. | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:18:00 | | |

| Task No. | Commander Activity | ALS E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|--|---|----------|
| C18.13 | Position lower sunshield over spring on upper probe section. | 01:18:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 | Remove LEAM dust cover (grasp pull ring and pull off cover). | P24.7 |
| C18.14 | Unfold probe assy. | :20 :22 :24 :26 :28 | Release leg/gnomon pull ring. | P24.8 |
| C18.15 | Insert probe into bore hole. | :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 | Release legs (pull leg lanyard in line with stripe on side of LEAM) and gnomon (continue same direction of pull for gnomon lanyard) and discard pull ring/lanyards. | P24.9 |
| C18.16 | Unstow UHT. | :54 :56 :58 01:19:00 | Emplace LEAM on lunar surface in line with the left outer side of pkg. 2 and with the cable positioned under the legs. | P24.10 |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|--|----------|
| C18.17 | Use UHT handle to hook emplacement tool strap. | 01:19 :00 | Align LEAM $\pm 5^\circ$ to shadow line corresponding to 25° offset (align gnomon shadow on sun compass) using UHT. | P24.11 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| C18.18 | Use UHT to lift emplacement tool from lunar surface. | :10 | Level LEAM $\pm 5^\circ$ (break bubble from edge of bubble level window) using UHT. | P24.12 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| C18.19 | Grasp emplacement tool. | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C18.20 | Disengage UHT handle from emplacement tool strap. | :30 | Remove UHT from LEAM carry socket. | P24.13 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| C18.21 | Stow UHT. | :40 | | |
| | | :42 | | |
| | | :44 | | |
| C18.22 | Place emplacement tool "Crow's Foot" between lower and upper sunshield. | :46 | Stow UHT. | P24.14 |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:20:00 | | |

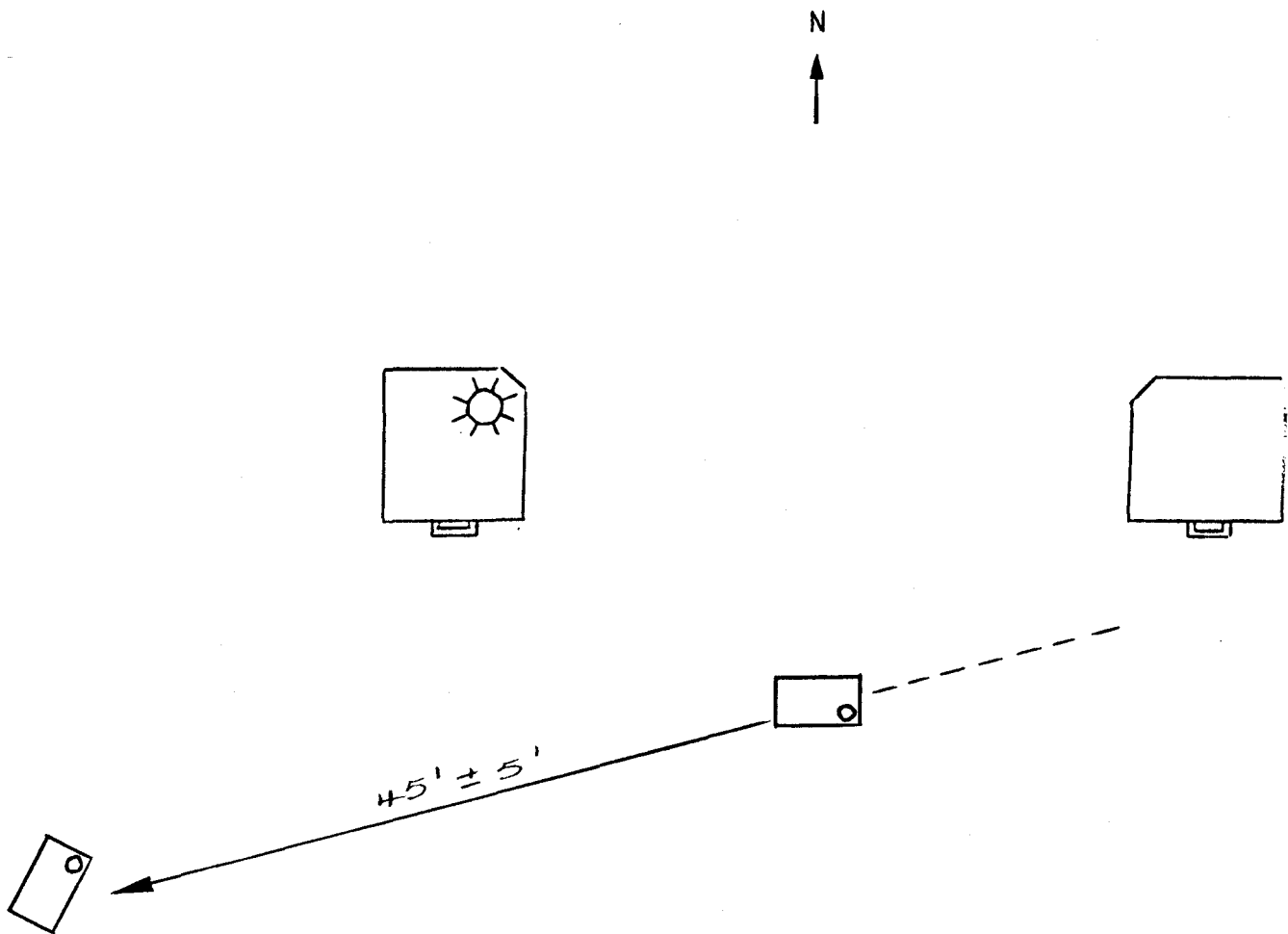


Figure 12 Deploy LMS

[illegible]

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|---|----------|
| | | 01:21 :00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| C18.26 | Use emplacement tool "Crow's Foot" to retrieve probe cable near upper sunshield. | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| C18.27 | Place emplacement tool "Crow's Foot" around probe cable on far side of upper sunshield. | :34 | Emplace LMS on lunar surface using UHT (site should be relatively flat i. e. within $\pm 15^\circ$). | P25.4 |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| C18.28 | Use emplacement tool to slide upper sunshield along probe cable and toward probe assembly. | :44 | Verify that LMS is level within $\pm 15^\circ$ (bubble is broken from edge of level window). If LMS is not level within $\pm 15^\circ$ do not embed the experiment; reposition it on a more level spot. | P25.5 |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| C18.29 | Use emplacement tool to ensure upper sunshield is fully deployed over drill hole. | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:22:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|---|----------|
| | | 01:22 :00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | Remove UHT from LMS swivel socket. | P25.6 |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C18.30 | Remove emplacement tool "Crow's Foot" from probe cable. | :14 | Engage UHT in LMS breakseal socket | P25.7 |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| C18.31 | Lower probe cable to lunar surface. | :22 | Break seal using UHT (lever UHT in direction of arrow to snap breakseal). | P25.8 |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| C18.32 | Discard emplacement tool. | :34 | Remove breakseal from UHT and discard. | P25.9 |
| | | :36 | | |
| | | :38 | | |
| C18.33 | Walk to HFE electronics pkg. | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Verify that LMS is level within $\pm 15^\circ$ and is not embeded in lunar surface. | P25.10 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 01:23:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|------------------------|----------|
| C19.0 | <u>Align HFE Electronics Pkg.</u> | 01:23 :00 | Stow UHT | P25.11 |
| C19.1 | Unstow UHT. | :02 | | |
| C19.2 | Use UHT to release four boydbolts on HFE electronics pkg. | :04 | Walk to HFE subpallet. | P25.12 |
| | | :06 | | |
| | | :08 | | |
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| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| C19.3 | Engage UHT in HFE electronics pkg. carry socket. | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| C19.4 | Use UHT to remove the HFE electronics pkg. from the HFE subpallet. | :56 | | |
| | | :58 | | |
| | | 01:24:00 | | |

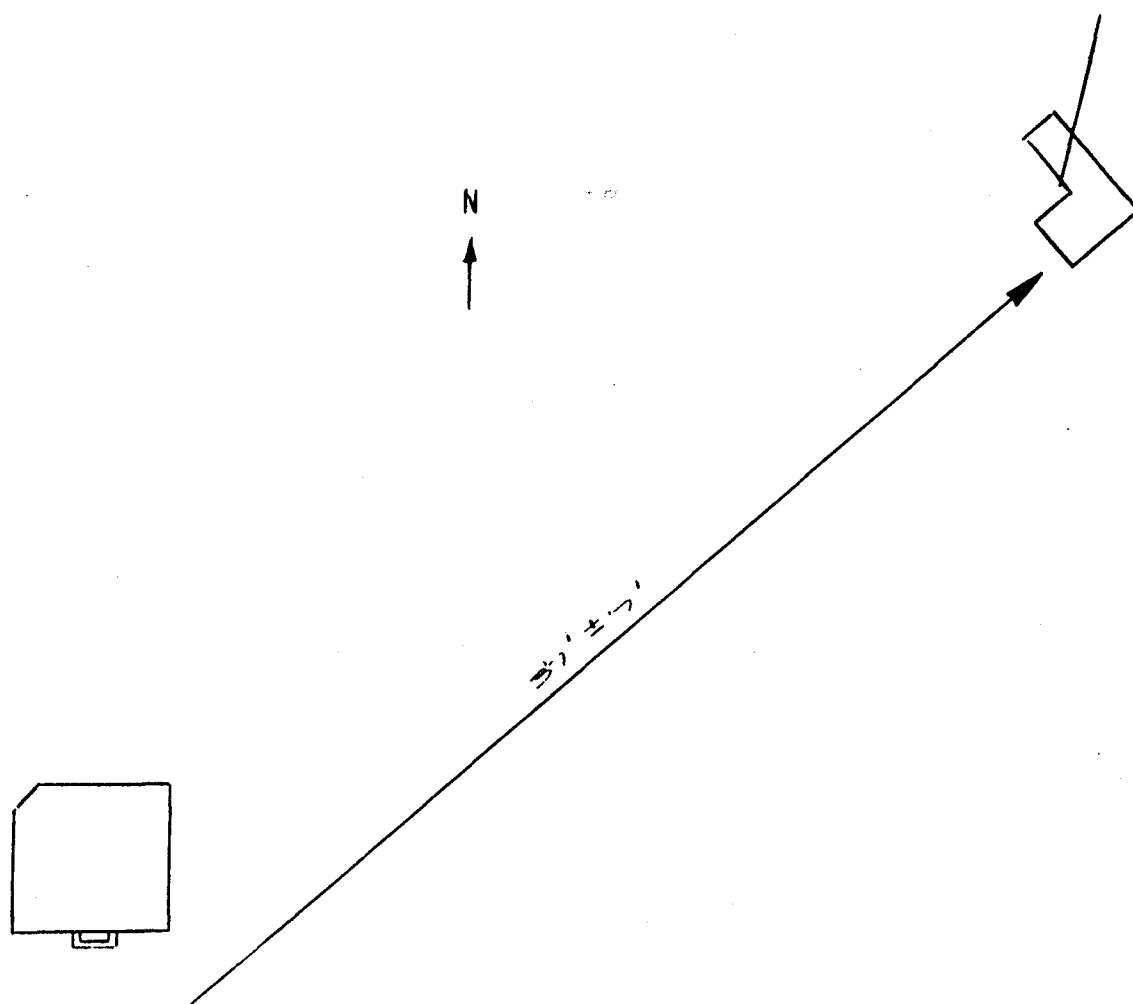


Figure 13 Deploy LSPE Remote Antenna

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---|---|-------------------------|
| C19.5 | Grasp dust cover pull ring and pull to remove dust cover. | 01:24:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 | <u>Deploy LSPE Remote Antenna</u> Unstow UHT. Hook UHT handle into HFE subpallet carry handle and lift HFE subpallet from lunar surface with UHT. | P26.0 P26.1 P26.2 |
| C19.6 | Discard dust cover. | :24 :26 :28 | Grasp HFE subpallet carry handle. | P26.3 |
| C19.7 | Use UHT to lower the HFE electronics pkg. to lunar surface so its open side faces away from the equator. | :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 | Disengage UHT handle from HFE subpallet carry handle. Stow UHT | P26.4 P26.5 |
| C19.8 | Observe bubble level and use UHT to level the HFE electronics pkg. | :50 :52 :54 :56 :58 01:25:00 | Walk to central station with HFE subpallet. | P26.6 |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|---|----------|
| C19.9 | Observe the shadow cast on the compass rose by the shaft of the UHT and use the UHT to align the HFE electronics package to a predetermined setting. | 01:25:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
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| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Swing HFE subpallet strut support assembly outward at about a 45 degree angle. | P26.7 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Using HFE subpallet carry handle lower HFE subpallet to lunar surface so that it rests on its legs. | P26.8 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
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| | | :56 | | |
| | | :58 | | |
| | | 01:26:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|---|----------|
| C19.10 | Disengage UHT from HFE electronics package. | 01:26:00 | Retrieve LSPE remote antenna and cable reel from central station sunshield. | P26.9 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C19.11 | Stow UHT. | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Lower LSPE antenna cable reel to lunar surface. | P26.1 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Grasp HFE subpallet carry handle and lift the HFE subpallet from the lunar surface. | P26.1 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Collapse HFE subpallet strut support assembly against the back of the subpallet. | P26.1 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
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| | | :58 | | |
| | | 01:27:00 | | |

| Task No. | Commander Activity | A. EP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|-----------------------------|---|---|----------|
| C20.0 | <u>Deep Core Activities</u> | 01:27:00 | Walk with HFE subpallet and LSPE remote antenna 40 feet northeast from central station. | P26.1 |
| | 01:27:00 to 02:12:00 | :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 01:28:00 | Lower HFE subpallet to lunar surface so that it rests flat on its back. | P26.1 |

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| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 01:28:00 | Fully extend antenna (grasp upper grip and | P26.15 |
| | | :02 | fully extend upper sections, using middle | |
| | | :04 | grip fully extend middle sections and using | |
| | | :06 | lower grip fully extend lower sections). | |
| | | :08 | | |
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| | | :26 | | |
| | | :28 | | |
| | | :30 | Lower LSPE remote antenna and position | P26.16 |
| | | :32 | the antenna mounting assembly in the HFE | |
| | | :34 | subpallet antenna socket. | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Unstow UHT | P26.17 |
| | | :52 | | |
| | | :54 | Engage UHT into antenna socket and push | P26.1 |
| | | :56 | downward on UHT handle to lock antenna | |
| | | :58 | into subpallet antenna socket. | |
| | | 01:29:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|--|----------|
| | | 01:29:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | Remove UHT from antenna socket and stow UHT. | P26.1 |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Visually level antenna/subpallet assembly. | P26.20 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
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| | | :58 | | |
| | | 01:30:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|------------------------------|----------|
| | | 01:30:00 | <u>ALSEP Photography</u> | P27.0 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | 01:30:00 | |
| | | :12 | to | |
| | | :14 | 02:29:00 | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Photograph ALSEP experiments | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | Documented samples | |
| | | :28 | | |
| | | :30 | | |
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| | | :58 | | |
| | | 01:31:00 | | |

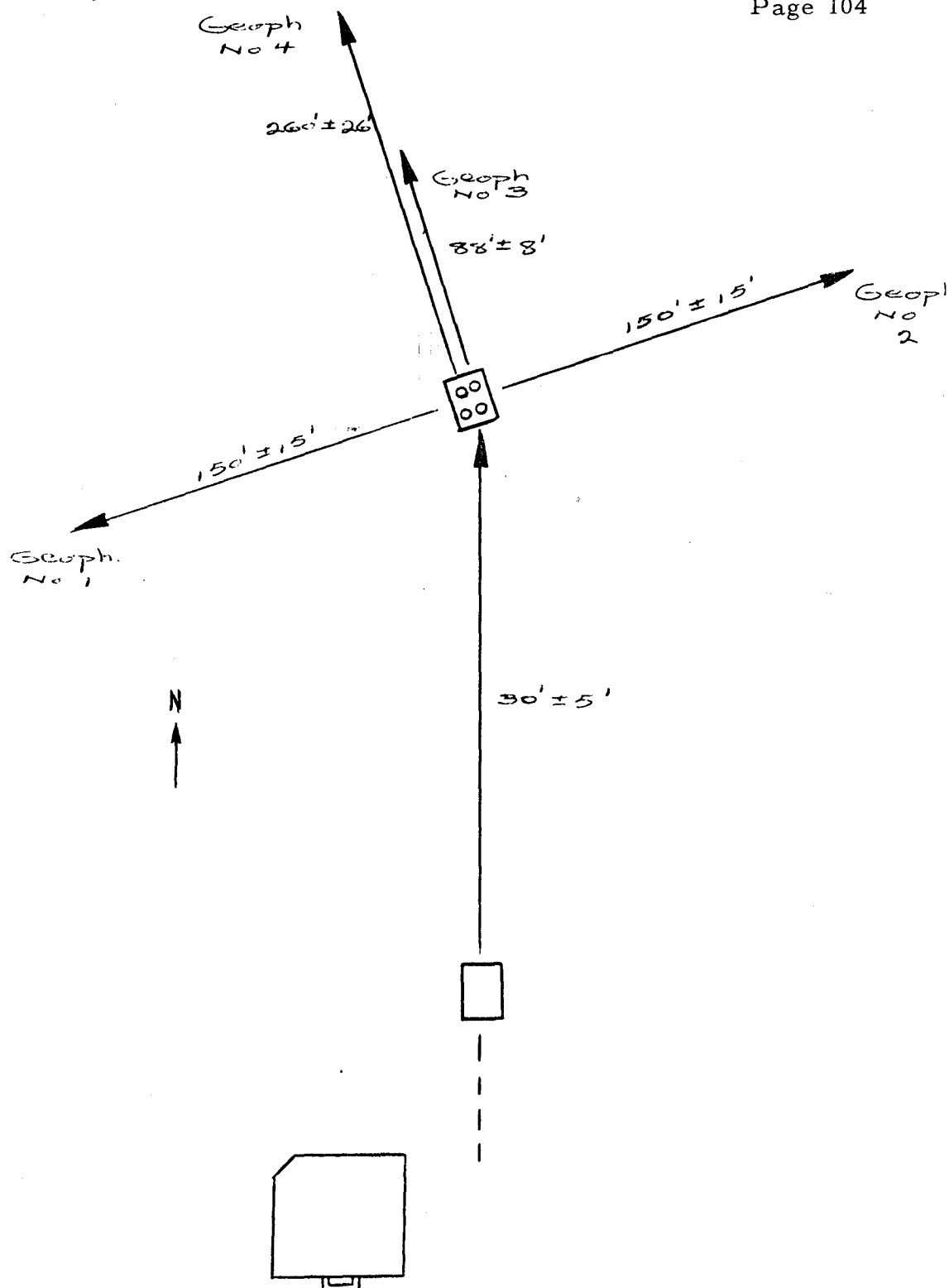


Figure 14 Deploy LSPE Geophone Module

| Task No. | Commander Activity | ASPE/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|--------------------------|-------------------|----------|
| C21.0 | <u>Deploy LSPE Geophone Module</u> | 02:12:00 | | |
| C21.1 | Unstow UHT. | :02 | | |
| C21.2 | Engage UHT in LSPE geophone module carry socket. | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C21.3 | Use UHT to lift LSPE geophone module from the lunar surface and transfer the geophone module and gnomon to the deployment site (30 feet north of central station). | :14 | | |
| | | :16 | | |
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| | | :50 | | |
| | | :52 | | |
| C21.4 | Temporarily emplace gnomon on lunar surface. | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 02:13:00 | | |

| Task No. | Command Activity | A P/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|-------------------------|-------------------|----------|
| | | 02:13:00 | | |
| C21.5 | Emplace geophone module on lunar surface. | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C21.6 | Disengage UHT from LSPE geophone module carry socket. | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| C21.7 | Engage UHT handle in geophone module cover pull ring. | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| C21.8 | Remove geophone module cover using UHT. | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| C21.9 | Grasp geophone module cover and disengage UHT handle from geophone module cover ring. | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 02:14:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|-------------------|----------|
| | | 02:14:00 | | |
| C21.10 | Stow UHT. | :02 | | |
| | | :04 | | |
| | | :06 | | |
| C21.11 | Pull geophone flag pull ring/lanyard assembly to release pull pins (2) from geophone flag holding retainers. | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
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| | | :20 | | |
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| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C21.12 | Remove first geophone flag from its holding retainer. | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| C21.13 | Deploy geophone flag and temporarily embed into lunar surface. | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| C21.14 | Remove second geophone flag from its holding retainer. | :56 | | |
| | | :58 | | |
| | | 02:15:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---|-------------------|----------|
| C21.15 | Deploy geophone flag and temporarily embed into lunar surface. | 02:15:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 | | |
| C21.16 | Remove third geophone flag from its holding retainer. | :20 :22 :24 :26 :28 | | |
| C21.17 | Deploy geophone flag and temporarily embed into lunar surface. | :30 :32 :34 :36 :38 :40 :42 :44 | | |
| C21.18 | Remove fourth geophone flag from its holding retainer. | :46 :48 :50 :52 :54 | | |
| C21.19 | Deploy geophone flag and temporarily embed into lunar surface. | :56 :58 02:16:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|-------------------|----------|
| | | 02:16 :00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| C21.20 | Remove fifth geophone flag from its holding retainer. | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| C21.21 | Discard geophone module cover. | :20 | | |
| | | :22 | | |
| | | :24 | | |
| C21.22 | Embed geophone flag/stake through cable loop and into lunar surface (using peddle if required). | :26 | | |
| | | :28 | | |
| | | :30 | | |
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| | | 02:17:00 | | |

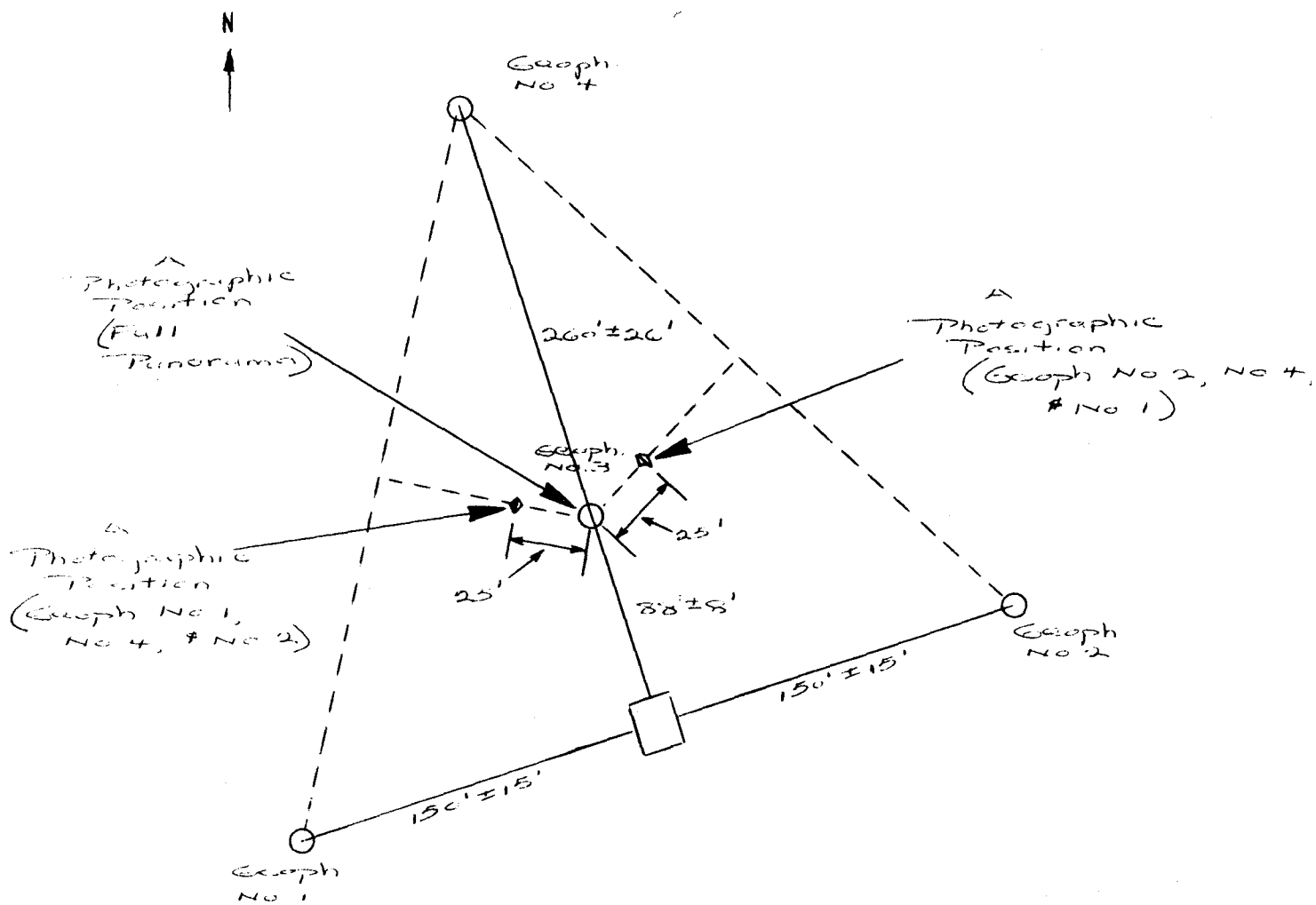


Figure 15 LSPE Geophone Deployment and Photographic Locations

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|-------------------|----------|
| C22.0 | <u>Deploy LSPE Geophones</u> (1st, 2nd and 4th) | 02:17:00 | | |
| C22.1 | Unstow UHT | :02 | | |
| C22.2 | Engage UHT in first geophone reel. | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C22.3 | Remove geophone reel from geophone module using UHT and transfer the reel and one of the flags to the deployment site (150 feet southwest of the geophone module). | :14 | | |
| | | :16 | | |
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| | | :58 | | |
| | | 02:18:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|----------------------|-------------|
| | | 02:18:00 | | |
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| | | 02:19:00 | | |

Task
No.

Commander
Activity

ALSEP/E
Time
(Cumulative)

LM Pilot
Activity

Task
No.

02:19:00

:02

:04

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02:20:00

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|-------------------|----------|
| | | 02:20:00 | | |
| C22.4 | Temporarily embed geophone flag into lunar surface. | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C22.5 | Remove the clip securing the geophone in the geophone reel. | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| C22.6 | Remove the geophone from the geophone reel. | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| C22.7 | Emplace geophone (lower geophone, using geophone cable, and step on geophone to embed it in the lunar surface). | :34 | | |
| | | :36 | | |
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| | | 02:21:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|--|-------------------|----------|
| C22.8 | Release geophone reel from the UHT and discard the reel. | 02:21 :00 :02 :04 :06 :08 :10 :12 :14 :16 :18 | | |
| C22.9 | Stow UHT. | :20 :22 :24 | | |
| C22.10 | Retrieve the geophone flag and embed into lunar surface, securing geophone. | :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 | | |
| C22.11 | Return to geophone module. | :54 :56 :58 02:22:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|----------------------|-------------|
| | | 02:22:00 | | |
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| | | 02:23:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|----------------------|-------------|
| | | 02:23:00 | | |
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| | | 02:24:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|-------------------|----------|
| | | 02:24:00 | | |
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| C22.12 | Unstow UHT. | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C22.13 | Engage UHT in second geophone reel. | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| C22.14 | Remove geophone reel from geophone module using UHT and transfer the reel and one of the flags to the deployment site (150 feet northeast of geophone module). | :40 | | |
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| | | :58 | | |
| | | 02:25:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---|----------------------|-------------|
| | | 02:25:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 02:26:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|----------------------|-------------|
| | | 02:26:00 | | |
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| | | :58 | | |
| | | 02:27:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|-------------------|----------|
| | | 02:27:00 | | |
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| C22.15 | Temporarily embed geophone flag into lunar surface. | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| C22.16 | Remove the clip securing the geophone in the geophone reel. | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| C22.17 | Remove the geophone from the geophone reel. | :50 | | |
| | | :52 | | |
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| | | :58 | | |
| | | 02:28:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|--|-------------------|----------|
| C22.18 | Emplace geophone (lower geophone, using geophone cable, and step on geophone to embed it in the lunar surface). | 02:28:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 | | |
| C22.19 | Release geophone reel from UHT and discard the reel. | :30 :32 :34 :36 :38 :40 :42 | | |
| C22.20 | Stow UHT. | :44 :46 :48 | | |
| C22.21 | Retrieve the geophone flag and embed into lunar surface, securing geophone. | :50 :52 :54 :56 :58 02:29:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|----------------------------|---------------------------|---|----------|
| C22.22 | Return to geophone module. | 02:29:00 | <u>Deploy LSPE Geophone (3rd)</u> | P28.0 |
| | | :02 | Unstow UHT. | P28.1 |
| | | :04 | Engage UHT in third geophone reel. | P28.2 |
| | | :06 | | |
| | | :08 | Remove geophone reel from geophone module using UHT and transfer the reel, the gnomon and one of the flags to the deployment site (88 feet northwest of the geophone module). | P28.3 |
| | | :10 | | |
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| | | 02:30:00 | | |

| Task No. | Commander Activity | EP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---|----------------------|-------------|
| | | 02:30:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 02:31:00 | | |

| Task No. | Command Activity | EP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|-------------------------------------|------------------------|---|----------|
| | | 02:31:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | Temporarily emplace gnomon on lunar surface. | P28.4 |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | Temporarily embed geophone flag into lunar surface. | P28.5 |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | Remove the clip securing the geophone in the geophone reel. | P28.6 |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | Remove geophone from the geophone reel. | P28.7 |
| | | :48 | | |
| C22.23 | Unstow UHT | :50 | | |
| | | :52 | | |
| | | :54 | | |
| C22.24 | Engage UHT in fourth geophone reel. | :56 | Emplace geophone (lower geophone, using geophone cable, and step on geophone to embed it in the lunar surface). | P28.8 |
| | | :58 | | |
| | | 02:32:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--|---------------------------|---|----------|
| C22.25 | Remove geophone reel from geophone module using UHT and transfer reel and one of the flags to the deployment site (260 feet northwest of the geophone module). | 02:32:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
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| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | Release geophone reel from the UHT and discard the reel. | P28.9 |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Stow UHT. | P28.1 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | Retrieve the geophone flag and embed into lunar surface, securing geophone. | P28.1 |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 02:33:00 | | |

| Task No. | Commander Activity | A. EP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|-----------------------------|-------------|
| | | 02:33:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | <u>Photograph Geophones</u> | P29.0 |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
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| | | 02:34:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|----------------------|-------------|
| | | 02:34:00 | | |
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| | | 02:35:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---|----------------------|-------------|
| | | 02:35:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 02:36:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|-------------------|----------|
| | | 02:36:00 | | |
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| | | :42 | | |
| C22. 26 | Temporarily embed geophone flag into lunar surface. | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| C22. 27 | Remove clip securing geophone in geophone reel. | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 02:37:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|-------------------|----------|
| | | 02:37:00 | | |
| C22.28 | Remove the geophone from the geophone reel. | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| C22.29 | Emplace geophone (lower geophone, using geophone cable, and step on geophone to embed it in the lunar surface). | :14 | | |
| | | :16 | | |
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| | | :42 | | |
| C22.30 | Release geophone reel from the UHT and discard the reel. | :44 | | |
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| | | 02:38:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---------------------------|-------------------|----------|
| C22.31 | Stow UHT. | 02:38:00 | | |
| | | :02 | | |
| C22.32 | Retrieve the geophone flag and embed into lunar surface, securing geophone. | :04 | | |
| | | :06 | | |
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| | | :32 | | |
| C22.33 | Return to central station. | :34 | | |
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| | | 02:39:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---|----------------------|-------------|
| | | 02:39:00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 02:40:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|----------------------|-------------|
| | | 02:40:00 | | |
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| | | 02:41:00 | | |

Task
No.

Commander
Activity

ALSEP/E
Time
(Cumulative)

LM Pilot
Activity

Task
No.

02:41:00

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02:42:00

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|----------------------|-------------|
| | | 02:42:00 | | |
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| | | 02:43:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|-----------------------|---------------------------|-------------------|----------|
| | | 02:43:00 | | |
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| | | :22 | | |
| C22. 34 | Unstow UHT. | :24 | | |
| | | :26 | | |
| | | :28 | | |
| C22. 35 | Activate LSPE switch. | :30 | | |
| | | :32 | | |
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| C22. 36 | Stow UHT. | :56 | | |
| | | :58 | | |
| | | 02:44:00 | | |

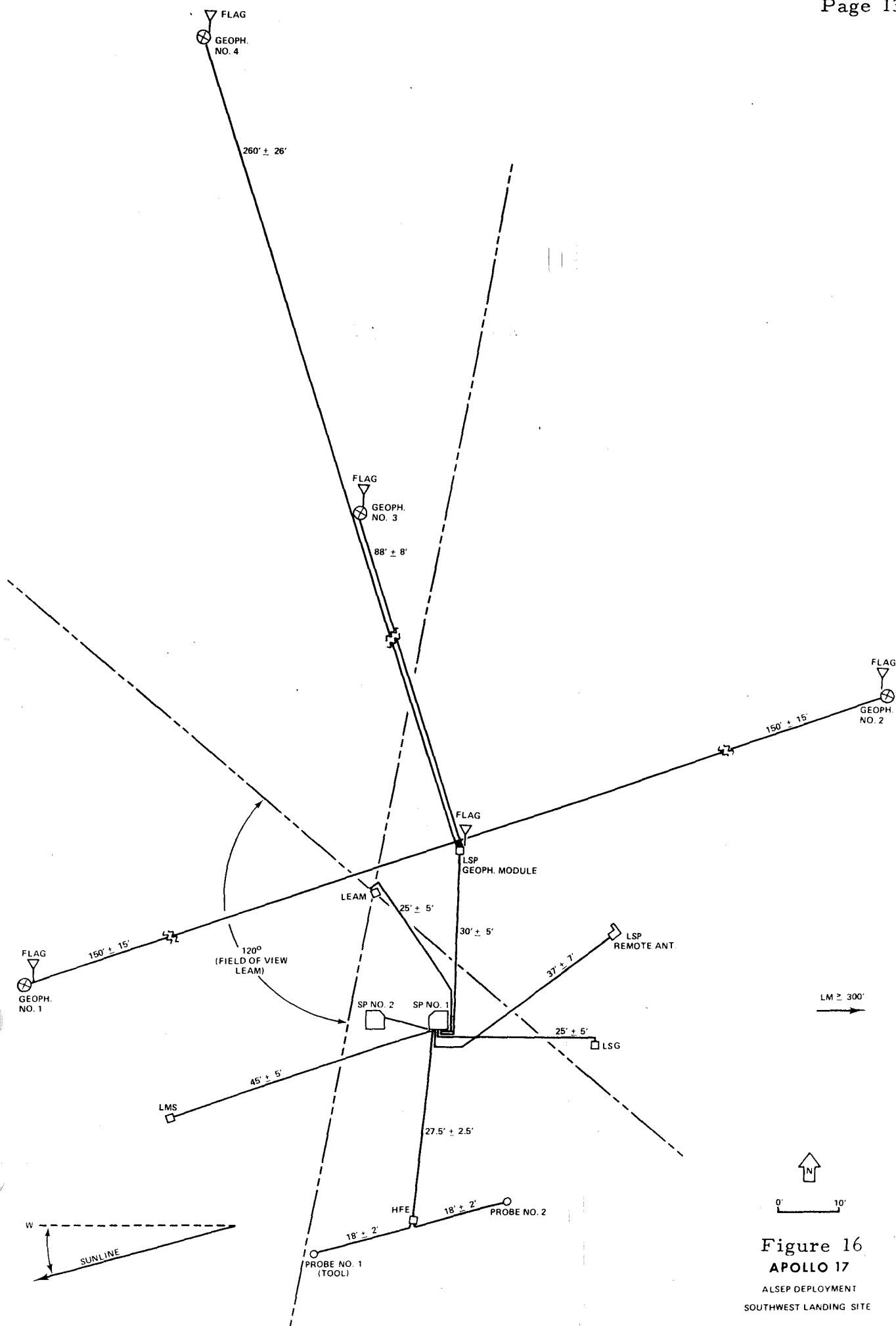
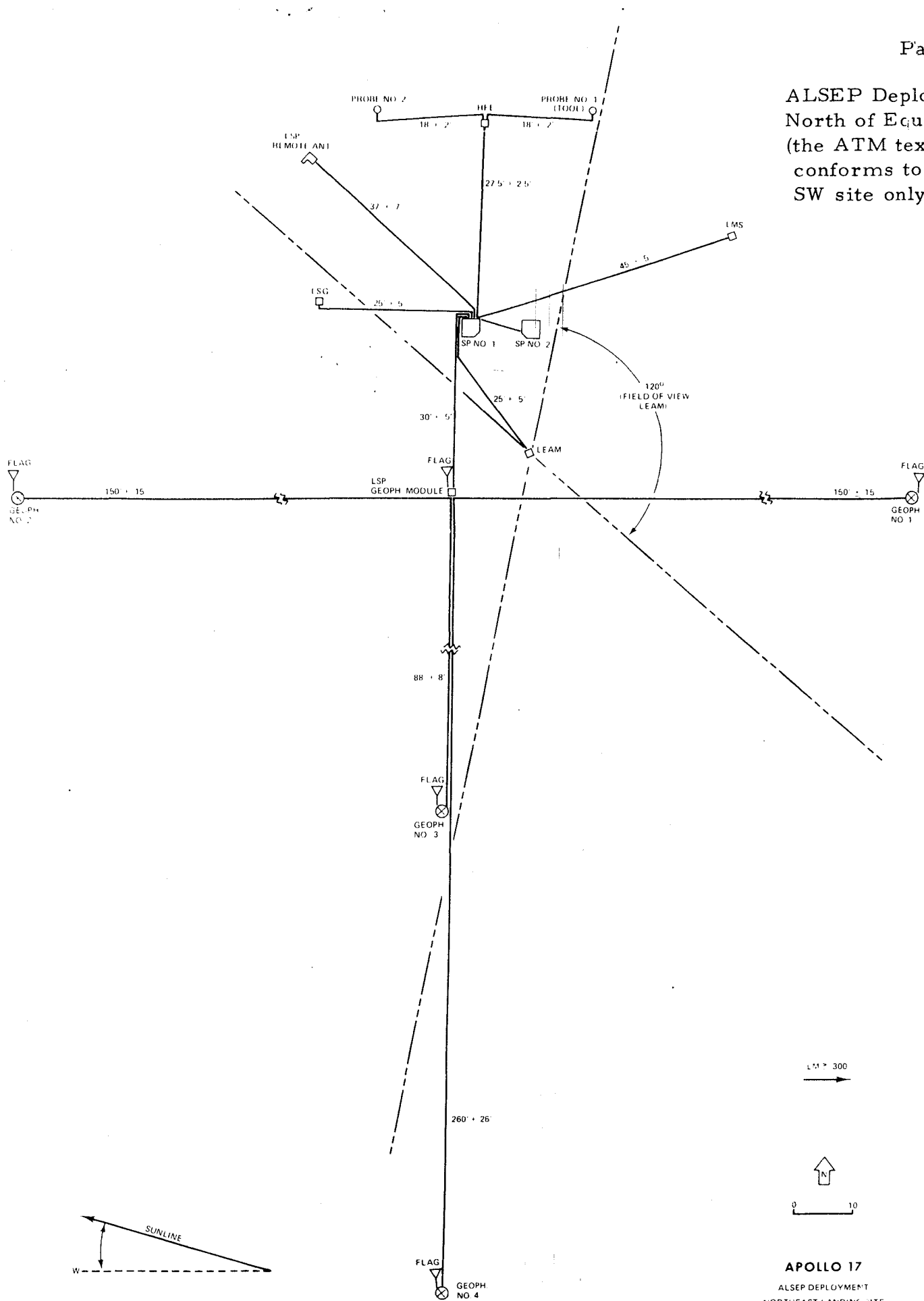


Figure 16
APOLLO 17

ALSEP DEPLOYMENT
SOUTHWEST LANDING SITE

ALSEP Deployment
North of Equator
(the ATM text
conforms to a
SW site only)



APOLLO 17
ALSEP DEPLOYMENT
NORTHEAST LANDING SITE
Figure 16 (A)

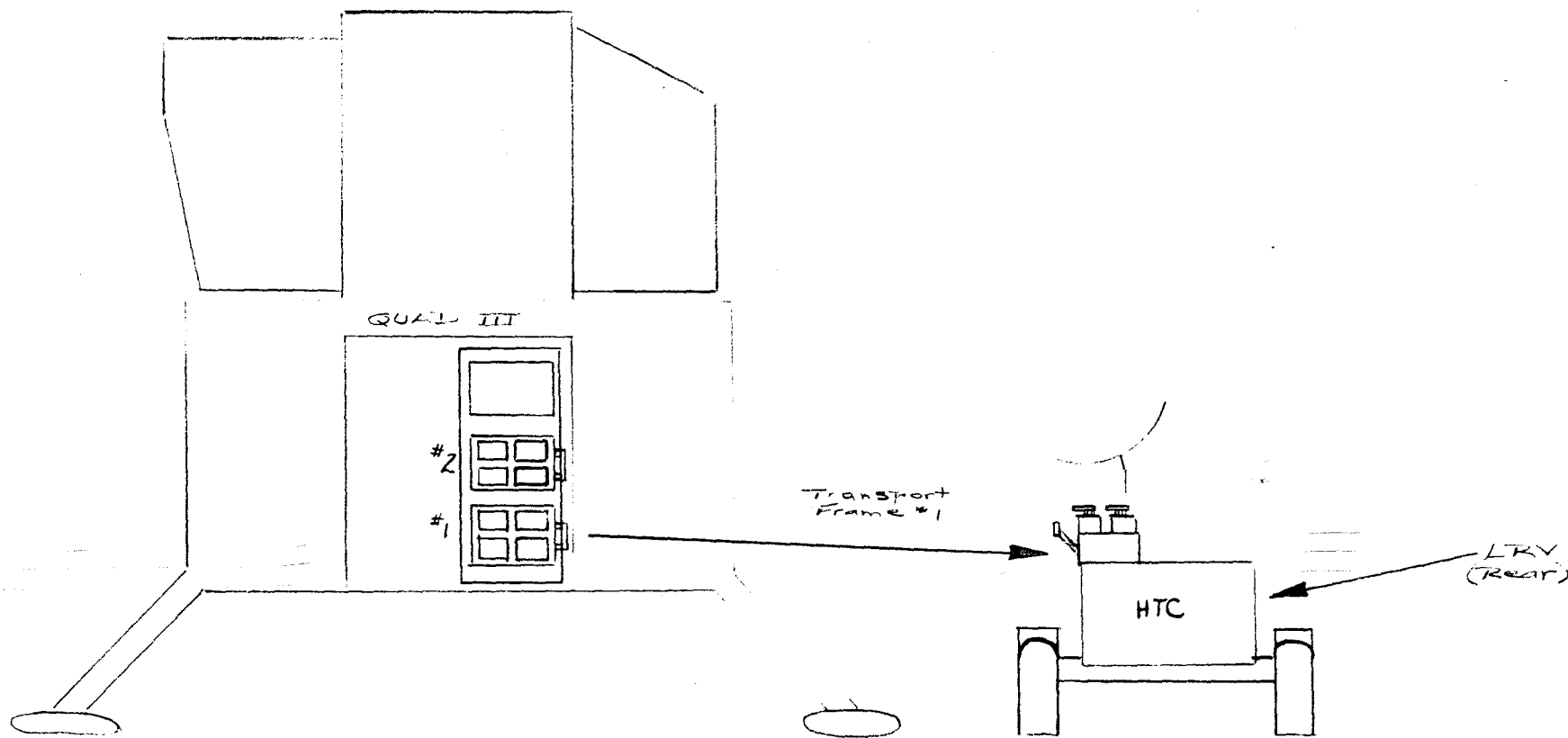


Figure 17 Offload Explosive Package Transport Frame #1
and Stow on LRV

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|-----------------------|---------------------------------|-------------------------------------|-------------|
| | | :00 | (AT END OF EVA #1) | P30.0 |
| | | :02 | Offload explosive package transport | |
| | | :04 | frame #1 and stow on LRV (in sun). | |
| | | :06 | | |
| | | :08 | | |
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| | | :58 | | |
| | | :00 | | |

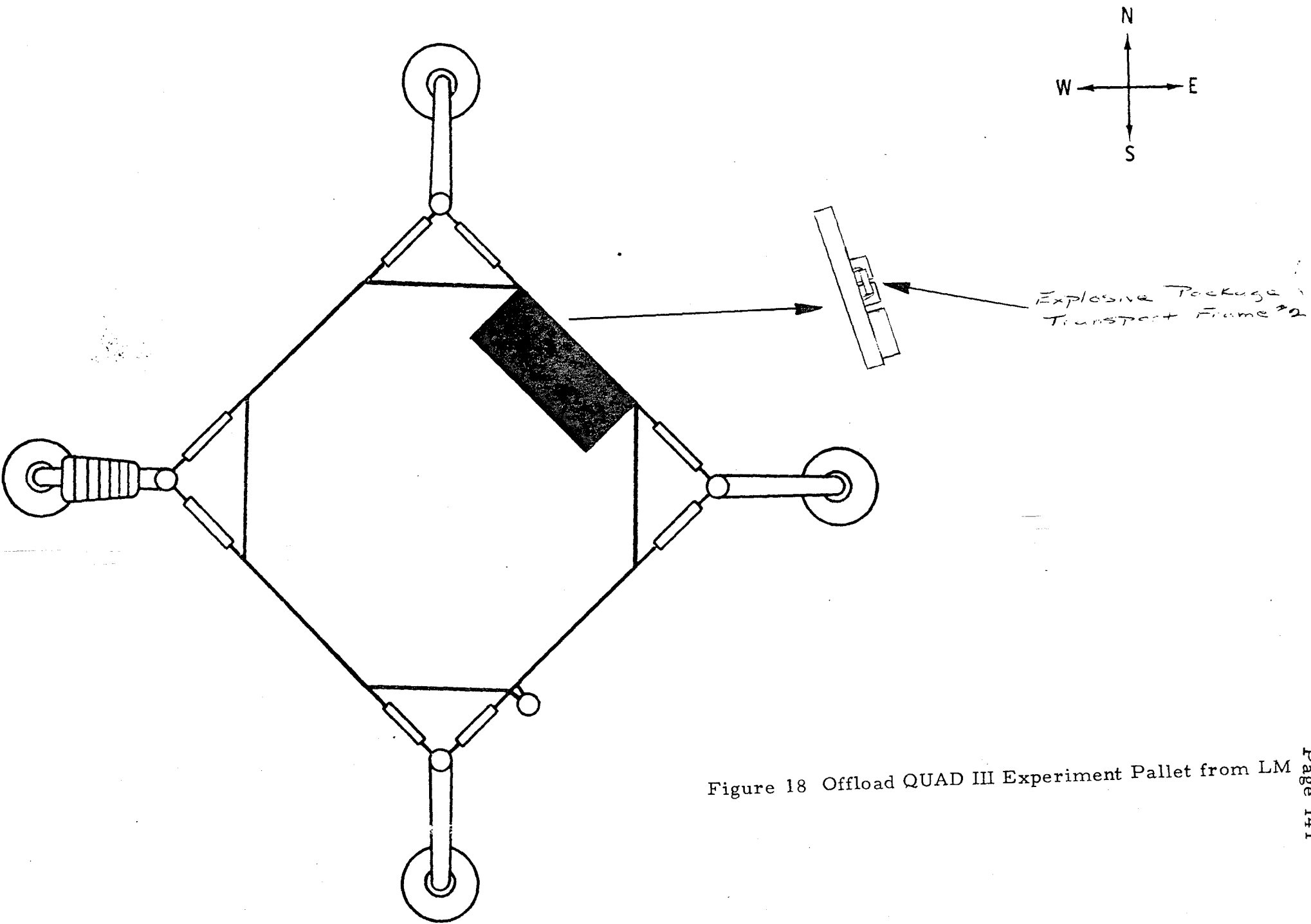


Figure 18 Offload QUAD III Experiment Pallet from LM

| Task No. | Command Activity | A P/E Time (Cumulative) | LM Pilot Activity <u>EVA #2</u> | Task No. |
|-------------|---------------------|-------------------------------|---|-------------|
| | | :00 | Remove QUAD III expt. pallet from LM and place pallet on side, facing sun. | P1.0 |
| | | :02 | | |
| | | :04 | | |
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| | | :00 | | |

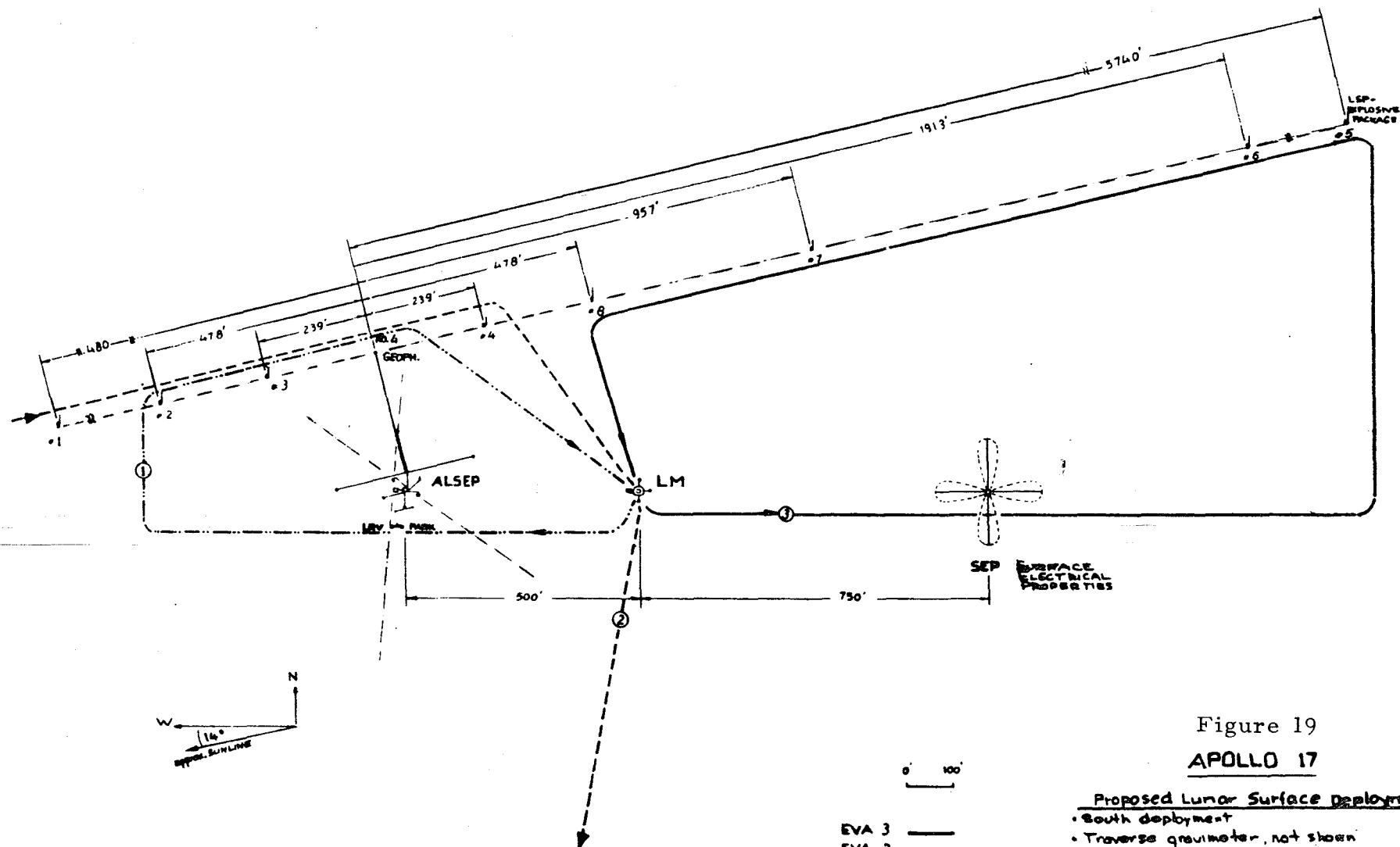


Figure 19
APOLLO 17

Proposed Lunar Surface deployment
 • South deployment
 • Traverse gravimeter, not shown

EVA 3 ———
 EVA 2 - - - -
 EVA 1 ·····
 1...8 LSP - EXPLOS. PVTG'S

CRGW ENGINEERING - NOV. 71

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|-------------|---|---|---|-------------|
| C1.0 | Traverse to explosive package #1 de- ployment site (on return to LM from EVA #2). | :00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 :00 | Traverse to explosive package #1 de- ployment site (on return to LM from EVA #2). | P2.0 |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:00:00 | <u>Deploy Four Explosive Pkgs.</u> | P3.0 |
| | | :02 | Remove camlock securing explosive | P3.1 |
| | | :04 | package #1 to transport frame by rotating | |
| | | :06 | CCW and discard camlock. | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Grasp explosive package #1 handle and | P3.2 |
| | | :22 | remove explosive package by rotating | |
| | | :24 | outward (toward center of transport frame). | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Transfer explosive package #1 to deploy- | P3.3 |
| | | :42 | ment site. | |
| | | :44 | | |
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| | | 00:01:00 | | |

| Task No. | Command Activity | A P/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|------------------|-------------------------|---|----------|
| | | 00:01:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Extend antenna (grasp upper grip and fully extend upper sections, using middle grip fully extend middle sections and using lower grip fully extend lower sections). | P3.4 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Remove safe/arm timer pull pin (pull ring #1). | P3.5 |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Remove safe/arm slide pull pin (rotate pull ring #2 70° CCW to permit removal). | P3.6 |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:0200 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:02:00 | Remove battery timer pull pin and firing pin pull pin (pull ring #3). | P3.7 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Emplace explosive package #1 on lunar surface (lower to lunar surface using antenna). | P3.8 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Align explosive package #1 (align arrow to sun). | P3.9 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Traverse to explosive package #2 deployment site. | P3.10 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | (Repeat above task sequence for deployment of explosive package #2, #3, and #4.) | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:03:00 | | |

| Task No. | Command Activity | A P/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|------------------|-------------------------|--|----------|
| | | :00 | At end of explosive package deployment, release latch securing transport frame #1 to LRV, remove transport frame #1 and discard. | P4.0 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | | |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | :00 | | |

Task
No.

Commander
Activity

ALSEP/E
Time
(Cumulative)

LM Pilot
Activity

EVA #3

Task
No.

:00
:02
:04
:06
:08
:10
:12
:14
:16
:18
:20
:22
:24
:26
:28
:30
:32
:34
:36
:38
:40
:42
:44
:46
:48
:50
:52
:54
:56
:58
:00

(AT BEGINNING OF EVA #3)
Offload explosive package transport
frame #2 and stow on LRV.

P1.0

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|---|---|---|----------|
| C1.0 | Traverse to explosive package #5 deployment site (on return to LM from EVA #3). | :00 :02 :04 :06 :08 :10 :12 :14 :16 :18 :20 :22 :24 :26 :28 :30 :32 :34 :36 :38 :40 :42 :44 :46 :48 :50 :52 :54 :56 :58 :00 | Traverse to explosive package #5 deployment site (on return to LM from EVA #3). | P2.0 |

Task
No.

Command
Activity

A P/E
Time
(Cumulative)

LM Pilot
Activity

Task
No.

00:00:00

Deploy Four Explosive Packages

P3.0

:02

Remove camlock securing explosive

P3.1

:04

package #5 to transport frame by rotating
CCW and discard camlock.

:06

:08

:10

:12

:14

:16

:18

:20

Grasp explosive package #5 handle and

P3.2

:22

remove explosive package by rotating

:24

outward (toward center of transport frame).

:26

:28

:30

:32

:34

:36

:38

:40

Transfer explosive package #5 to deploy-
ment site.

P3.3

:42

:44

:46

:48

:50

:52

:54

:56

:58

00:01:00

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:01:00 | | |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Extend antenna (grasp upper grip and | P3.4 |
| | | :12 | fully extend upper sections, using middle | |
| | | :14 | grip fully extend middle sections and using | |
| | | :16 | lower grip fully extend lower sections). | |
| | | :18 | | |
| | | :20 | | |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | | |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | Remove safe/arm timer pull pin (pull | P3.5 |
| | | :42 | ring #1). | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | Remove safe/arm slide pull pin (rotate | P3.6 |
| | | :52 | pull ring #2 70° CCW to permit removal). | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:02:00 | | |

| Task No. | Commander Activity | ALSEP/E Time (Cumulative) | LM Pilot Activity | Task No. |
|----------|--------------------|---------------------------|---|----------|
| | | 00:02:00 | Remove battery timer pull pin and firing pin pull pin (pull ring #3) | P3.7 |
| | | :02 | | |
| | | :04 | | |
| | | :06 | | |
| | | :08 | | |
| | | :10 | Emplace explosive package #5 on lunar surface (lower to lunar surface using antenna). | P3.8 |
| | | :12 | | |
| | | :14 | | |
| | | :16 | | |
| | | :18 | | |
| | | :20 | Align explosive package #5 (align arrow to sun). | P3.9 |
| | | :22 | | |
| | | :24 | | |
| | | :26 | | |
| | | :28 | | |
| | | :30 | Traverse to explosive package #6 deployment site. | P3.10 |
| | | :32 | | |
| | | :34 | | |
| | | :36 | | |
| | | :38 | | |
| | | :40 | (Repeat above task sequence for deployment of explosive package #6, #7 and #8.) | |
| | | :42 | | |
| | | :44 | | |
| | | :46 | | |
| | | :48 | | |
| | | :50 | | |
| | | :52 | | |
| | | :54 | | |
| | | :56 | | |
| | | :58 | | |
| | | 00:03:00 | | |

Task
No.

Commander
Activity

ALSEP/E
Time
(Cumulative)

LM Pilot
Activity

Task
No.

:00
:02
:04
:06
:08
:10
:12
:14
:16
:18
:20
:22
:24
:26
:28
:30
:32
:34
:36
:38
:40
:42
:44
:46
:48
:50
:52
:54
:56
:58
:00

At end of explosive package deployment,
release latch securing transport frame #2
to LRV, remove transport frame #2 and
discard.

P4.0