



This ATM presents the results of post-vibration deployment of the Magnetometer Experiment and Solar Wind Experiment by the Crew Engineering Department.

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I. Purpose

- A. To evaluate whether or not the nominal 0.003 inch tolerance between the ME mounting bracket and the ALSEP mounting pins permit removal of the ME from its stowed configuration by a suited subject.
- B. To evaluate the ability of a suited subject to deploy the SWE.

II. Hardware & Test Conditions

- A. Pressurized Apollo A2L pressure suit, with Mission and Crew Engineering Thermal Micrometeoroid Garment, thermal gloves and the Portable Life Support System mockups. Suited subject at 1G.
- B. BxA Prototype #1 model of the ALSEP Package #1.
- C. ARC Dynamic model of the Magnetometer Experiment.
- D. JPL model 4A of the Solar Wind Experiment.
- E. Mission and Crew Engineering mockups of the Tie-Down Release Tool and the Experiment Handling Tool.

III. Facilities

Mission and Crew Engineering Test Facility, Plant #2.

IV. Procedures

- A. BxA Test and Structures personnel transport Package #1, with the ME and SWE mounted on it, from the vibration test area to the M & C Engineering test facility.
- B. Package #1 was placed on the concrete apron in front of the simulated lunar surface.
- C. Personnel present for the test included:



Herb Cross, Owen Minnick - Magnetometer
Herman Miller, Jim Rotta - Solar Wind
Ron Redick (subject), Terry Tallmadge (suit technician) -
M & C Engineering
Jim Whiteford - BxA Test Department

V. Results

A. ME removal from Package #1.

1. A removal handle was added to the ME to simulate the handle which was not available for the test. The handle, an endless loop, was located directly over the mounting bracket.
2. Removal of the fasteners from the yoke assembly.

The in-board (near center of pallet) fastener was removed successfully with a warning that the visual and physical envelope in gaining access to the fastener head must not be restricted any more than exists in this (dynamic) model. The removal of this fastener is the most difficult of all existing fasteners, and presently requires a one hand turning motion to remove.

The outboard fastener presented no problems.

3. Yoke removal.

The yoke assembly was not removed due to the scheduling problems, packing requirements and the late hour of the test. However, a suggestion was made to increase the finger ingress height of the handle to allow for easier removal.

4. EGFU activation and unlocking sequence.

The pull to activate and unlock feature is superior to the turning motion required on the previous model.

5. Removal from the pallet/brackets.

The left hand was used to retrieve the removal strap anticipating the right hand while being used for carrying the experiment. No carrying strap was on this (dynamic) model. It is very



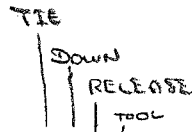
important to see this design soon, so it is not a surprise later in the final design.

The experiment was pulled from the retaining brackets at a slight angle due to body positioning and came off very well. The torque required to remove the experiment was not enough to notice, indicating it must be well under three (3) foot pounds. The reader must appreciate the fact that while suited an astronaut subject is not aware of torquing forces under three to four foot pounds.

The ME was re-attached to the brackets two more times and removed without any noticeable problems in removal. In fact as a subjective comment, the ME was easier to remove the first time than the second and third.

One point which the experiment designers should consider is a fixed removal handle so the handle may be used as a moment arm to aid in removing and controlling the experiment.

B. Solar Wind Experiment Deployment.



1. The fasteners were removed with the TDRT starting with front right fastener then working clockwise.

Locating the fasteners with the TDRT is a difficult task; they can be found in due time. However, if the cup assembly was used as in BxA Drawing #2334674, this problem would be minimized. H. Miller concurred and integration of the cups around each fastener will be evaluated by JPL.

2. The experiment was removed and legs extended without difficulty. One leg deployed itself which caused some concern. However, by direction in training the astronaut should be reminded to, in my opinion, fully extend and lock each leg. At lunar gravity the leg would not have enough weight to deploy.

Several techniques can be used to deploy the legs making the experiment very flexible.

Deployment height is sufficient to preclude any reach parameter problems.



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VI. Test Data

- A. Several pictures were taken by the BxA photographer. These color pictures will be available by 9 October 1967.
- B. A follow-up Magnetometer deployment will be performed in late October to verify the complete design.

Verification of the removal and deployment will be performed in the KC-135 when a model is available. This final test must be completed as a combined NASA/BxA test.