27 Aug 57

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August 22, 1957

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Gentlemen:

This reports progress during July, 1957, on the development of an Equipment Safeguard Unit which shall meet the following requirements:

1. The unit shall be wholly contained in a weather-tight enclosure of dimensions approximately 6" x 5-3/4" x 4" (dimensions to meet AN rack mounted equipment specifications).

2. The unit shall initiate two strands of Primacord through reliable independent explosive trains.

3. The unit shall be so designed as to prevent accidental initiation by requiring two-handed operation.

4. The unit shall provide a reliable time delay of at least 30 seconds between actuation and initiation. 35±5

5. The unit shall pass environmental tests necessary for qualification under Military Specification MIL-E-5272A, titled "Environmental Testing, Aeronautical and Associated Equipment, General Specifications for,"

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6. The unit shall be so designed as to permit surveillance and replacement of explosive and pyrotechnic components periodically.

7. The unit shall be detonator safe; that is, initiation of the detonators in the safe position shall not initiate the succeeding elements in the explosive train, nor shall such initiation throw fragments or particles from the weather-tight enclosure.

PROGRESS

During the period covered by this report, a new design was made incorporating the features outlined in last month's report (namely, 4 delay columns, two boosters, and new lever and safety button combination). This design is shown on Drawing E12502. The rotor, having 4 delay columns located two each in parallel planes at 90° to each other, is shown on Drawing D12503 and the rotor housing with the two boosters and primacord entrances is shown on Drawing D12513.

A model was made of this design and is shown in the picture attached to this report. This model was made with teflon bearings and teflon faced firing pins to cut down on friction, and has a rotor return spring. The teflon bearings were replaced with bronze bearings without affecting the functioning of the model. The model functions well mechanically and will be used for immersion tests.

The loading of the delay column and boosters was discussed with loading engineers at Atlas' Reynolds Experimental Laboratory. As a result of this discussion, the booster length was shortened to 3/4" and four test blocks simulating the booster containing portion of the rotor housing, with the exit portion of the delay columns in rotor, were fabricated for the purposes of testing booster propagation (since leads enter side of booster) and fragmentation, if any, caused by booster detonation. Pending satisfactory results of these tests, five rotor and rotor housing combinations will be fabricated and used for delay column testing and static safety tests. Any design changes and model fabrication are being held pending the results of these tests.

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A series of primacord fittings has been designed, molds fabricated, and limited quantities of fittings fabricated. These fittings are shown in simulated use on inert primacord, and separately in the photographs attached to this report. Used with each is a primacord end cup, as shown in Drawing A12514. Drawings of the fittings are as follows:

Long Nut	-	Drawing A12516
Long Union	-	Drawing A12520
Short Union	-	Drawing A12519
Split Tee	-	Drawing A12517

Propagation tests using these fittings will be performed in the near future.

FUTURE WORK

In the immediate future, limited explosive tests of various types for propagation and static safety will be performed to determine if design changes are necessary in Design E12502. Also, propagation tests using the primacord fittings will be performed. Satisfactory results of these tests will mean that fabrication of models for test and delivery can be started immediately.

STATUS OF FUNDS

Funds Allocated	$ 33,685.62
Previous Expenditures	4,948.48
Balance at Beginning of Period	28,737.14
Expenditure During Period	8,526.86
Balance at End of Period	20,210.28

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Very truly yours

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