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JUN 17 1960

SUMMARY

During FY 1960, the Discoverer program made major advances toward realization of its stated objectives. The period saw design improvements factored into the system which were confirmed by the flight test program.

Seven Discoverer vehicles were launched. Of these, five attained orbit. In general, the test program exhibited progressive improvement culminating in the very successful operation of Discoverer XI, which was very close to nominal in all phases except recovery.

Fabrication and delivery schedules were maintained throughout the year in support of the launch rate. During the year the program was increased from twenty-five vehicles to a total of thirty-three.

The major problem remaining is successful recovery of the capsule from orbit. To this end, at the close of the year, special recovery capsules were being fabricated and thoroughly ground tested. The objective of this capsule will be to diagnose the entire recovery sequence on Discoverer XII and transmit the information to ground stations. Discoverer XII will be launched near the turn of the fiscal year.

WDZYD 372

Capt. Simpson: This is the Discoverer write-up for the Annual ARDC Effectiveness Report. More detail can be included if you desire or other areas covered if you specify them

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Program Management

Full responsibility for the Discoverer program was transferred from ARPA to the Air Force on 17 November 1959 by DOD. Throughout the year, program management was exercised by the Directorate, Discoverer Satellite System of AFBMD over the prime contractor, Lockheed Missiles and Space Division, and the supporting government agencies. Systems Engineering and Technical Direction of the program is the responsibility of Lockheed. The ability of the contractor to accomplish this task improved during the year.

Development

Progressive development of the Agena family of satellite vehicles was accomplished during the past year. Fabrication test and delivery of all Agena "A" vehicles and the initial Agena "B" configuration vehicles were completed. Definite progress was made in each of the Discoverer subsystem areas. PFRT of the XLR 81-Ba-7 was completed. PFRT of the XLR 81-Ba-9 engine is imminent. Successful design, fabrication and test of the 45:1 area ratio thrust chamber for the XLR-Ba-9 engine, a major step in increased performance, was accomplished. Trouble was encountered with the graphite material in the initial design, but use of titanium reinforced by molybdenum ribs made possible a successful nozzle extension.

In the booster area, action was taken to increase the accuracy of the DM-21 by installation of the BEL Guidance System in the first stage. This will reduce the orbit injection dispersion and thus increase velocity margins and orbital accuracy.

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The major technical milestones yet to be accomplished is to recover a capsule from orbit. Results to date have necessitated an extensive evaluation of the recovery system components. Exhaustive component testing is being accomplished and preparations are being made to launch a highly instrumented capsule on Discoverer XII.

Redeployment of the recovery forces has also been instituted to provide the maximum capability for tracking the re-entering capsule and reception of capsule telemetry.

Initial installation of recovery equipment in one C-130 was made and tests are being run. Plans are to convert from the C-119 to the C-130 during the coming year.

Launching and Tracking

Launches were made from both pads 4 and 5 of Complex 75-3 at Vandenberg AFB during this fiscal year. Conversion of pad 5 to handle the Agena "B" configuration was completed. Conversion of pad 4 will be started when the launch schedule permits.

The Annette Island Tracking Station in Alaska was discontinued after having served its purpose.

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