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1968 ANNUAL REVIEW OF THE PROGRAM OF THE SATELLITE TECHNIQUES BRANCH

8 February 1968

A. BRANCH MISSION:

Develop the technology for satellite techniques to support research and development in areas of scientific and military missions in space.

B. MAJOR PROJECTS:

Task areas include the design, construction and launch of satellites and are specified by the following problem assignments:

NRL Prob. No.	Title	Sponsor	FY 68 ($K)
A01-17	Satellite Development	Co-op with 5600 for AF	
A01-20	Research Satellite	Co-op with 7120 for NAVAIR	
R04-16a	Timation	Co-op with 5160 for "	
* Sub-assignments: to:		NRL Code 5130 NRL 6460 NRL 8440	
** Sub-assignment to:		NRL Code 5130	

C. EXECUTION OF THE PROGRAM:

1. A01-17

Launch of [redacted] in May, 1967 placed in orbit seven NRL satellites built by this Branch. Four satellites were military payloads, two were 16 in. and 20in. diameter calibration spheres, and one was a two-axis gravity gradient stabilized instrumented package for the Timation experiment. The first successful three-axis gravity gradient satellites were demonstrated on this launch and satellite stabilization characteristics are being studies to determine dynamic models for orbital and magnetic disturbances that have caused unexpected responses and

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reversals of stability modes. Damper designs have been evaluated from observance of ~~xxxxx~~ orbital performance. The application of ammonia vapor micro-thrusters has proved successful and will be used in future designs.

Construction of four military satellites is underway for a launch scheduled near the end of 1968. These satellites will employ three-axis gravity gradient stabilization and weigh 275 lbs. each. Three additional military payloads had been considered for this launch but delays in response to proposals of design has precluded delivery for this launch.

2. A01-20

SOLRAD-8 satellite ceased transmission of useful data in November 1967 and all operations connected with this satellite have been completed. SOLRAD-9 is being completed and will be delivered to Wallops Island for integration in a launch scheduled at the end of this month. This satellite will record real-time analog and digital and also stored digital data to provide world-wide coverage of solar x-ray and ultra-violet emmissions. Plans for SOLRAD-10 will consider the possibility of an orbit with a perigee height of 18 earth radii and maximum circularity. Payload limitations would require minimization of sensors to be carried. If the proper launch vehicle and kick rocket are not available for a high altitude orbit SR-10 would probably carry a sensor array similar to SR-9.

Data transmission circuits have been established between the station and NRL for remote observation and processing of satellite telemetry data.

3. R04-16a

In addition to those satellites being constructed for the year-end launch in 1968, eight satellites are under construction for NRL Code 5160, including

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Timation II, a SOICAL cylinder, a 16 inch Temperature Satellite, a SURCAL with twelve (12) 100' rods (Dodecapole), a SURCAL with 200 ft. long rod, and three CALSPHERES. This brings the NRL construction program for this launch to 12 satellites weighing a total of 1,334 lbs.

D. PRODUCTIVITY:

The Branch will meet scheduled launches of vital importance to Navy interests in space missions. Heavy work loads and delivery accomplishments in the past indicate that overall Branch productivity in hardwares is high. The demands of hardware construction have precluded reporting of scientific findings and no formal reports have been produced.

E. PROBLEM AREAS:

1. Recent acquisition of space on the third floor of Bldg. 59 should improve working conditions.

2. A few key personnel have been lost to industry in the past year and efforts to fill these positions with professional engineers have been made uncertain by ceiling limitations and hiring restrictions.

3. The publication of experimental results from gravity gradient satellites has been incumbered by secufity problems. In general, personnel qualified to prepare reports are occupied completely by design, construction, testing and launch demands.

F. SUMMARY:

1. The Branch should submit requests as soon as possible to fill vacated positions with professional engineers.

2. Every effort should be made to publish information on gravity gradient experiments by assignment of responsibility to cognizant personnel and through clarification of security requirements.

[redacted] Code 5160

R. Mayo, 64-56 1/2

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FOR THE REVIEW COMMITTEE:

[redacted] Chairman Code 5100