QUARTERLY PROGRAM REPORT

P-989 PROGRAM

Program Manager: Colonel Paul F. Foley

1. Summary

Five P989 satellites were operational during this reporting period. TOPHAT II's intermittent loss of modulation on the data downlink continued during this reporting period. However, two-thirds of the planned collections were deemed processable. RAQUEL I, RAQUEL IA and URSALA III operated well throughout the entire period. After six months of on-orbit operation, URSALA IV experienced its first two major anomalies. With the increase in vehicle temperature, the expected intermittent loss of the Band 2 delta channel occurred on 29 June 1979. On 9 September 1979, the primary Band 3 local oscillator became intermittent which caused the complete loss of Band 3 data. The latter problem was corrected by commanding the backup local oscillator for Band 3. By the end of the quarter, the combined tasking of all five satellites reached nearly 900 minutes per day.

The system tests on the LORRI Pallet are nearly complete, with only a portion of the thermal vacuum test and the Pallet/Host Electromagnetic Compatibility Test remaining. All tests are scheduled to be completed by the end of October.

2. Specific Status

a. On-Orbit Spacecraft

(1) Mission 7340/TOPHAT II. TOPHAT II was launched in April 1974 to provide information on troposcatter communications signals in the 450

to 1000 MHZ region. The loss of modulation on the data downlink, reported in the last report, continued to be intermittent. Two possible causes for the intermittent loss of modulation are: (1) a bad FET in the payload and/or, (2) tape/tape head separation due to a build-up of debris on the recorder head. Because the vehicle's thermal environment has been stabilized, it is felt that the latter is the cause of the problem. Tape Recorder #3 is continuing to operate satisfactorily since the vehicle's attitude has been changed to maintain elevated tape recorder temperatures. As of 21 September 1979, the TOPHAT II Tape Recorder #3 has accumulated 11344 record-read-out cycles.

(2) Mission 7341/RAQUEL I. RAQUEL I continues to support technical intelligence, directed and general search, and operational ELINT collection in the 4-18 GHZ range. Launched in October 1974, this mission remains operational and continues to be tasked over 180 minutes per day. Orbit decay is predicted for February 1980.

(3) Mission 7343/URSALA III. This mission, now approaching three years on orbit, continues to support operational ELINT and general search requirements. URSALA III status remains excellent except for the 5 to 9 db loss of collection sensitivity across the entire 2-12 GHZ collection band. Tasking has increased to approximately 280 minutes per day.

(4) Mission 7345/RAQUEL IA. This mission is nearly identical to RAQUEL I and supports the same collection requirements. All of the mission objectives are being satisfactorily accomplished despite the loss of Tape Recorder #3. Probable cause for the failure has been narrowed to either: (1) a split or broken drive belt, or (2) a slipping or dislocation of the motor drive pully. There is no history of similar failures on previous types of

recorders. The long term effect of the loss of Tape Recorder #3 will be a reduction in tasking flexibility and a minor reduction in mean system life. With this failure, the usage of recorders #1 and #2 has been reduced to 14 cycles/day each from their previously planned 16 cycles/day. Currently, RAQUEL IA is being tasked approximately 135 min/day.

(5) Mission 7344/URSALA IV. The mission of URSALA IV is general search, operational ELINT or technical intelligence for the 2-12 GHZ band. URSALA IV was launched 16 March 1979. On 29 June 1979, the intermittent loss of Band 2, (4-6 GHZ) delta channel data, occurred. This anomaly, which was originally detected in thermal vacuum chamber tests, was expected to occur as the vehicle's temperature increased. The anomaly is caused by a malfunctioning tunnel diode amplifier in the Band 2 delta channel. When this condition is present, monopulse geopositioning, with better than 0.4 degree accuracy, is not possible. Instead, the monopulse geopositioning is accomplished via a centroiding technique with, at best, 1.2 degree accuracy. Automatic certification of anomalous Band 2 delta data began on 12 July, whereby these signals are automatically detected as being anomalous and are geopositioned using the centroiding technique. Over the past 11 weeks the anomalous condition has been present approximately 87% of the time.

On 9 September 1979, the intermittent loss of Band 3, (6-8 GHZ) data from both the 3 and 6 foot antennas, began. By 14 September 1979, the intermittent condition had turned into a hard failure. The failure was subsequently isolated to the Band 3 local oscillator. On 17 September, the redundant local oscillator was switched in. Band 3 was regained and operation has been satisfactory ever since. URSALA IV is being tasked in excess of 280 minutes per day.

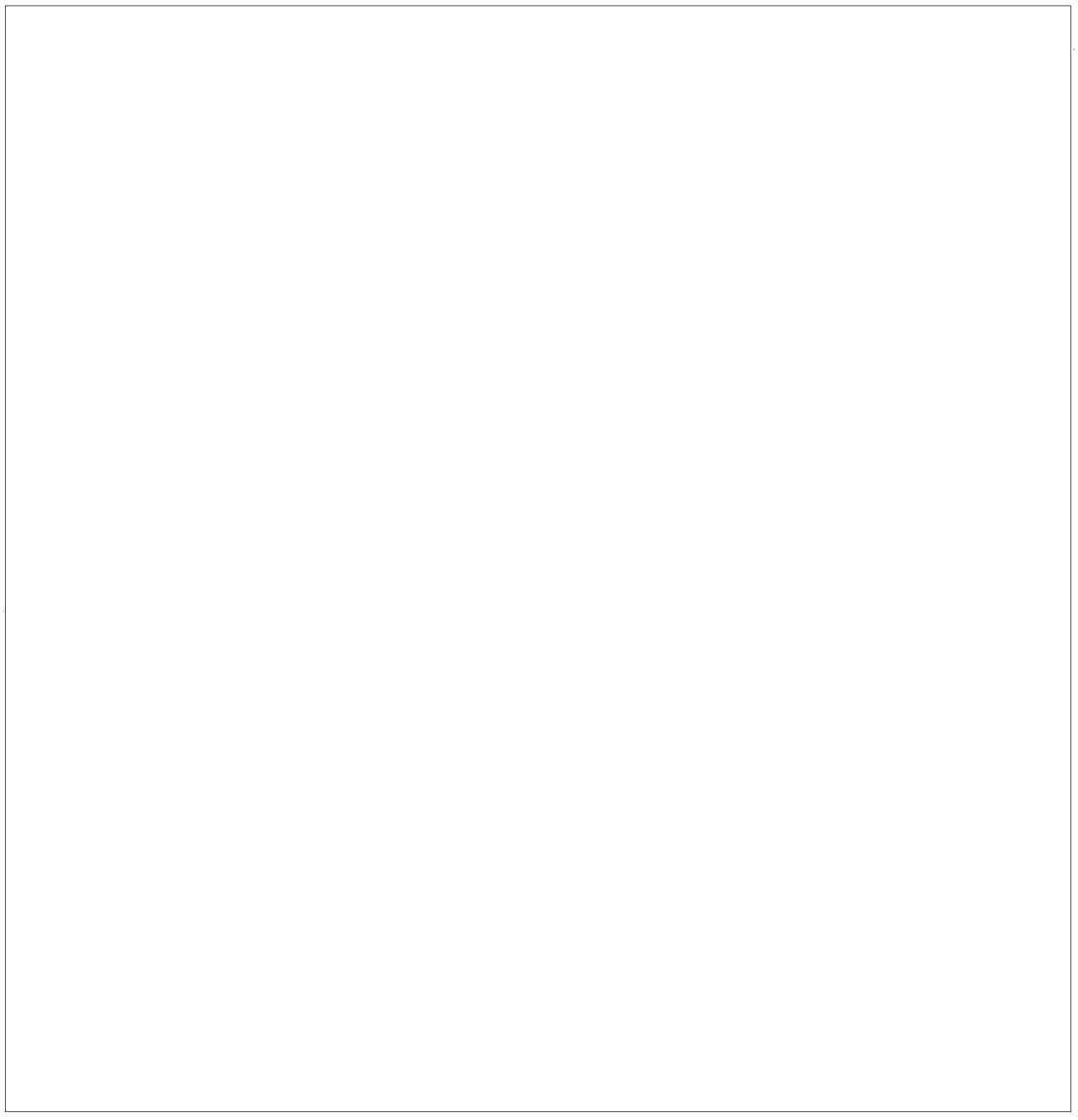
b. Vehicles Under Development and Test

(1) Mission 7241/LORRI. System test of the LORRI space segment continued. Compatibility with the Satellite Control Facility was demonstrated, acoustic and pyro shock tests were performed, and a check was made of the mechanical interfaces with the host vehicle. All of the tests of the LORRI space segment met their acceptance criteria. This testing also provided data to support the checkout of the LORRI ground data processing systems. At the close of the reporting period the system thermal vacuum test was in process. Detailed planning for the operational phase of the project has begun. The project remained on schedule for launch on SV-16, of the host program, in March 1980.

(2) Mission 7346/FARRAH I. The design of the FARRAH I payload is complete. Integration of the payload engineering model is in progress with several subsystems through test. The payload flight unit is currently in assembly. The antennas are in final assembly and initial test and the onboard computer has passed qualification testing. The computer flight unit is in final assembly. The first two, of three, recorders have been delivered. All spacecraft subsystems are progressing satisfactorily toward a spacecraft/payload integration in August 1980.

(3) Mission 73XX/FARRAH II. FARRAH II long lead procurement was initiated on 10 August 1979. Initial efforts concentrated on the procurement of critical long lead microelectronic piece parts and RF subassemblies for the payload segment, and microelectronic and CMOS devices for the stored command sequencer and command memory within the spacecraft segment. In November 1979, the remainder of the long lead material is expected to be authorized. The emphasis of this effort will be the

procurement of the residual hi-rel material needed for the payload, and the initiation of the development of the long lead subsystems of the spacecraft kit, which are not presently available off-the-shelf. This will provide a basis for the fabrication and assembly of FARRAH II payload modules and spacecraft subsystems starting in July 1980.



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