Viking Mission Support

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This article reports DSN activity in support of Viking 1 and 2 cruise operations, together with the implementation and new training directed toward completing the planetary configuration of the DSN for Viking support by 1 February 1976.,

I. Background

As Viking 1 and 2 settle into the cruise phase of the mission, DSN Operations continues to support the Viking Flight Teams in providing tracking support from both 26-meter subnets, as well as the 64-meter subnet. At the same time, additions are being made to the Network, particularly at the 64-meter stations, to bring the cruise configuration up to meet the planetary requirements.

This situation leads to a demand for station time which far exceeds the resources available. The situation is further aggravated by additional requirements for operational tests to train the station crews and to qualify the added capabilities for flight support.

Some degree of resolution has resulted from the establishment of an integrated Viking scheduling committee, which coordinates all DSN demands for implementation testing and training with Project demands for flight support, sets priorities within this total body of work, and presents a total Viking support request to the scheduling office.

II. Planetary Testing and Training

A considerable number of Operational Verification Tests (OVTs) were carried out during this period. These are discussed below.

A. Operational Verification Tests

In the previous article, the DSN testing plan for planetary operations was outlined. At this time, the first testing phase is progressing smoothly and should be completed as forecast (reference *Progress Report 42-30*). The first phase testing at DSSs 11 and 14 (Goldstone, California) has been completed, and the program for DSSs 42 and 43 (Australia) and DSSs 61 and 63 (Spain) is proceeding as planned. Listed below are the tests completed at each facility and a brief summary of results.

DSS 14 64-meter planetary OVTs.

(1) OVT 1—90% successful, discovered more time required for pre-test calibrations.

(2) OVT 2—95% successful, low SNRs on one of six telemetry streams.

(3) OVT 3—90% successful, block decoder assembly down.

(4) OVT 4—100% successful.

DSS 11 and 14 combined planetary OVTs

(1) OVT 1—50% successful, problem with microwave link between DSSs 11 and 14.

(2) OVT 2—50% successful, delay in reconfigurations and validation of telemetry data rates.

(3) OVT 3—100% successful

(4) OVT 4—95% successful, SSA overheating problem.

DSS 43 64-meter planetary OVTs

(1) OVT 1—95% successful, minor operational problems.

(2) OVT 2—90% successful, no DODR recalls performed.

(3) OVT 3—65% successful, interference from real-time operations.

DSS 42 and 43 conjoint planetary OVTs

(1) OVT 1—100% successful.

(2) OVT 2—100% successful.

(3) OVT 3—100% successful.

DSS 63 64-meter planetary OVTs

(1) OVT 1—100% successful.

(2) OVT 2—70% successful, interface problem between Ground Communication Facility (GCF) and Network Operations Control Center (NOCC).

(3) OVT 3—90% successful, delay in data validation.

DSS 61 and 63 conjoint planetary OVTs

(1) OVT 1—80% successful, test start delayed, and equipment problems in the Network Analysis Team area.

(2) OVT 2—100% successful.

The above takes the DSN testing effort up to December 8. Phase one will be completed by early January. Phase two will begin the week of March 8, 1976. There will be four OVTs scheduled at each complex, consisting of two tests with the 64-meter stations by themselves, and two tests involving their 26-meter conjoint stations. This final OVT phase is scheduled to be completed during the week of April 8, 1976.

III. DSN Support of Additional Viking Testing

In addition to the above DSN tests, the support of System Integration Tests (SITs) and Ground Data System (GDS) Tests is progressing as forecast in the previous article. To date, DSSs 11 and 14 have participated in the following tests:

(1) Planetary SIT—100% successful. Interface problem between Ground Communication Facility and Viking Mission Computer Control Complex was resolved.

(2) GDS 5.1—Considered successful. No DSN problems encountered.

Following GDS test 5.1, the next GDS test will be 5.31 to be run December 15. This will involve DSSs 11 and 14 at Goldstone, California. The test results will be reported in the next article of this series.

In January, SIT and GDS testing will begin overseas at Australia and Spain. On January 8, a SIT test is scheduled for DSS 43 (Australia), with a retest, if necessary, on January 13. On January 15, a SIT is scheduled for DSS 63 (Spain), with a retest on January 22.

GDS 5.32 will be run in January, with the overseas portion beginning at DSSs 42 and 43 on January 15. On January 16, GDS 5.32 will be performed with DSSs 61 and 63. In February, GDS test 6.0 is scheduled. This will involve DSS 14 at Goldstone and DSS 43 in Australia. The remaining GDS test, 11.0, is scheduled for May, but no station has been designated at this time.

IV. Flight Operations Personnel Test and Training

As reported in the last article, the Flight Operations Personnel Test and Training follows GDS testing. These tests are scheduled to begin in mid-February. They should be completed by April. Details concerning these tests are not readily available at this time, and will be covered in future articles.