DSN Research and Technology Support

R. M. Gosline
RF Systems Development Section

The activities of the Development Support Group for the 2-month period ending August 15, 1972, are summarized. The activities are arranged according to whether they were performed at DSS 13 or at the Microwave Test Facility (MTF), and are further subdivided as to the section receiving support. Activities include operational clock synchronization, precision antenna gain measurements, weak source observations, pulsar observations, planetary radar, and DSS 14 400-kW transmitter support.

During the 2 months ending 15 August 1972 the Development Support Group performed the following activities.

I. DSS 13 Activities

A. In Support of Section 331

*1. **Pulsars.*** Observations of various pulsars continued at the Venus Station (DSS 13) for a 24-hour period once per week.

*2. **Planetary radar.*** Continuing the support of the MVM 73 spacecraft missions, ranging data were obtained for the planet Venus on 5 different days. As in the past, the transmitting and receiving are done at DSS 14 with the pseudonoise code generation, data processing, and mission control at DSS 13. Ranging experiments were also performed on the Jupiter moon Calisto, the planet Mercury, and the asteroid Toro.

B. In Support of Section 333

*1. **Precision antenna gain measurement.*** The Apollo Lunar Surface Experiments Package (ALSEP) and various radio stars were used as calibration sources from which data were obtained to calculate the absolute antenna gain and absolute flux density. A total of 89 hours was devoted to ALSEP and 128 hours to the radio stars.

*2. **Weak source observations.*** Data were obtained on 17 radio sources which are being investigated as suitable calibration sources for the DSN. The automatic boresight and data-taking technique utilized the SDS-930 computer and the DSS 13 Conscan program.

C. In Support of Section 337

*1. **Clock synchronization transmissions.*** Transmissions resumed in accordance with DSN scheduling as tabulated in Table 1.

*2. **DSN 400-kW transmitter support (DSS 14).*** Continued technical support was provided to DSS 14 in this area.

II. Microwave Test Facility (MTF) Activities

A. In Support of Section 333

1. Antenna panel noise burst generation. Testing has continued prior to planning a more extensive investigation at DSS 13.

B. In Support of Section 335

1. Pocket RF Monitor. Testing of the pocket RF monitor, described in Ref. 1, has begun.

C. In Support of Section 337

1. Klystron testing. Additional klystron tests were performed in support of the DSN transmitters.

Reference

1. Jackson, E. B., "DSN Research and Technology Support," in *The Deep Space Network Progress Report,* Technical Report 32-1526, Vol. X, pp. 149–151. Jet Propulsion Laboratory, Pasadena, Calif., Aug. 15, 1972.

Table 1. Clock synchronization activity from DSS 13

Stations	Number of transmissions
DSS 41	21
DSS 42	9
DSS 51	17
DSS 62	13