

June 1948

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1. Radiometer at UHF

The first UHF radiometer, consisting of a modified Giant Wurzburg antenna and associated electronic equipment, was completed and put into operation. This instrument operates on a frequency of 480 Mc/s and has provisions for automatic tracking of the sun in its path across the sky. Bursts of solar noise were observed on approximately twelve of the days on which the equipment was operating.

A second UHF radiometer, for operation on a frequency of 160 Mc/s, was partially completed. A Giant Wurzburg antenna was erected on a polar axis and work was started for providing the drive mechanisms, the setting circles, and the electronic equipment. Ground was broken for a 70-ton foundation for a third radiometer to operate on a still lower frequency. Contracts for the rehabilitation of the various large pieces required for this radiometer were let.

A paper entitled "Radio Astronomy" was given before the Physics Club of Philadelphia, on May 23, 1948, and a similar talk was given at a scientific staff meeting at the Bureau on June 6, 1948.

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The determination of absolute field intensities from measured receiver inputs depends upon a knowledge of antenna directivity patterns as well as of vertical angles of arrival. Experiments were begun to determine what size of ground mat is needed to simulate a perfect earth for purposes of calculating incident fields received by a vertical antenna of known dimensions.

(d) Antennas and Radio Noise

(H.V. Cottony, H.F. Cones, P.P. Viezbicke, J.D. Bryant,
J.J. Hitchman, E.T. Spielman)

1. Antennas for Radio Propagation Measurements (Project 5.1)

A paper entitled "Interim Report on Experimental Broad-Band Antennas for Vertical-Incidence Ionosphere Sounding" was presented at the URSI-IRE meeting on May 3, 1948, by Mr. H.N. Cones. A report with the same title was also issued as CRPL report No. 5-3.

Further progress was made on the installation of a model antenna range for obtaining field intensity patterns of ionosphere sounding antennas and preliminary tests of a prototype installation were encouraging.

2. Atmospheric Radio Noise (Project 5.6)

Construction was started of a post-amplifier for noise-figure measuring purposes. This instrument will include a high-gain low-noise-figure superheterodyne receiver with a 1.6-Mc/s i-f amplifier, a built-in rectified output meter and a 3-db attenuator; a diode noise probe and associated power supply.

3. Cosmic Radio Noise (Project 5.11)

A paper entitled "Broad Directivity Measurements of Cosmic Radio Noise at Very High Frequencies" was presented by Mr. J.R. Jöhler on May 3, 1948, at the URSI-IRE meeting. This paper summarizes most of the work which has been done to date on this project.

The installation was kept operational during the quarter (with exception of occasional air-conditioning-equipment failures) and noise-level data on the frequencies of 25, 50, 75 and 110 Mc/s are being obtained and analyzed. Further work was also being done to improve the equipment from the standpoint of accuracy of results and reliability of operation.

e. Radio Astronomy

(G. Reber, D. Sands, E Beck, J. Fozdar (Guest Worker from India))