

## 14.6 EXPERIMENTAL MICROWAVE RESEARCH SECTION

### Progress on Active Projects

14.6/2. Cosmic Noise Directivity

14.6/4. Rehabilitation of Wurzburg Equipment

14.6/11. UHF Radiometer

Data have continued to be taken at 480 Mc on solar radiation for the past quarter. It is in the process of being analyzed and a report upon this subject will be issued. A second radiometer for frequencies of 160 Mc has been erected and will probably be in operation during the next quarter. The parts for a third Wurzburg have been secured, foundations have been installed, broken parts have been repaired, and the steel work has been delivered. This radiometer will be erected during the coming quarter. A fourth mirror which has a solid sheet-metal dish, mounted upon an alt-azimuth mounting, has been assembled and will be ready for use as soon as electricity and a building have been secured.

Electronic equipment for a frequency of 160 Mc has been practically completed and will be installed upon the second Wurzburg. Electronic equipment for a frequency of 53 Mc has been completed and will be installed on the 32-ft solid dish.

### 14.6/8. Electric Hygrometer Research

Eighty electric hygrometers on life test were calibrated. Hygrometer units were also calibrated for two Divisions of the Bureau.

A slide-rule arrangement was devised and made to facilitate the quick determination of relative humidity from wet- and dry-bulb thermometer readings.

Some tests were started on a hygrometer in which the movement of a hygroscopic film due to humidity changes is a measure of humidity.

A die was made for stamping gold-comb electric hygrometers for use in the radiosonde circuit. This type of hygrometer when coated with the new phosphoric-acid solution may make possible humidity readings at higher altitudes.

A new method was devised for indicating the full humidity range (10 to 95% RH) on a single indicating instrument, in which a rotary switch connects 8 electric hygrometer units in sequence across a large condenser.

employing directive antennas at higher frequencies seemed indicated for further research on this question.

#### 14.5/11. Cosmic Radio Noise

The program for continuously recording cosmic radio noise in the lower portion of the VHF band was continued. A new 25-megacycle antenna was installed and a changeover made. A new antenna for 110 megacycles had been erected but the changeover had not yet been made. A fifth recording system for 35 megacycles was partially completed.

An effort was made to bring up-to-date the preliminary reduction of data obtained, since the equipment had been operating reliably. This work was nearly completed.

#### 14.5/12. VHF Radio Relay Equipment

Four radio telemeters were constructed under contract by a commercial concern to specifications prepared by the Bureau. These units were delivered, tested for acceptance, and turned over to the Weather Bureau for field and operational tests. It was expected that members of the Section would participate in these tests.

#### 14.5/13. Effects of Meteors on Radio Wave Propagation

In cooperation with Section 1, observations were made on 27.2 Mc and 40.98 Mc during the Perseids shower in August. Observations were attempted on 13.6 Mc, but the interference level in this portion of the high-frequency band was too high to obtain satisfactory results. It was estimated that a total of more than 10,000 meteors were observed during all of the August runs. Some of the results of the data analysis being made by Section 1 will appear in the quarterly report of that Section.

Work continued on refining the equipment. A surplus indicator from a type SCR-270 radar was modified for a range-time presentation on any one of four frequencies, the data being recorded by photographic means. Work was done towards developing automatic recorders for counting the number and duration of meteors detected by the equipment.