

September 3 - 1948

Frequency Utilization Research (Section 4) - Results of field measurements of UHF and VHF communications equipment were analyzed and preparations were made by the Navy to demonstrate equipment operating in the two bands at the Patuxent Naval Air Test Center. The results of the analysis were found to be in general as predicted from the theoretical study.

A study was made of the required signal-to-noise ratio for different types of communication services, for the FFB in Geneva, Switzerland, to assist them in establishing appropriate values for international frequency-allocation purposes. Preparations for measuring the desired-to-undesired signal ratio required for A-1 telegraph messages in a study being made for the FFB, Geneva, Switzerland, neared completion.

Mr. William Q. Crichlow attended a hearing on the allocation of frequencies for accurate radio navigational facilities for exploring coastal waters for oil. Informal advice was furnished the FCC and oil company engineers regarding propagation characteristics of frequencies proposed for these navigational facilities.

Experimental Ionospheric Research (Section 5) - Weather Bureau applications for four VHF radio telemeters were received for acceptance tests. These were completed and the units turned over to the Weather Bureau for field testing. The original prototype VHF radio telemetering equipment developed at CRPL was tested by the Weather Bureau for transmission of facsimile and found to perform satisfactorily in this application. The prototype is being shipped to Chicago where it will be used for transmitting weather maps from the Chicago Weather Bureau office to the Municipal Airport.

Experimental Microwaves Research (Section 6) - The foundations for the third Wurzburg radiometer were completed and a considerable part of the iron was delivered by the various contractors. Work on this machine is proceeding and should be completed within the next month or so. The carriage for the 32-foot mirror brought to CRPL from Wheaton, Illinois, was assembled and the sheet iron which formed the mirror was put in place. This machine will not be complete until the parapet is installed. Records of solar radio field intensities at 480 Mc continue to be taken 5 days each week. Abnormal outbursts were noted on about 10 percent of the days.

Field Operations (Section 7) - Several enlisted men of the U.S. Army Signal Corps reported for instruction in radio wave-propagation measurement techniques. They are a part of a group which will replace the present Army ionosphere team at Adak, Alaska.

Mr. Alan P. Stansbury was transferred from his assignment as Engineer-in-Charge of the White Sands Field Station to a position as Equipment Engineer at the D.C. Laboratory.

Word was received from Headquarters, Alaskan Air Command, that modifications to the building to be used as a Radio Propagation Field Station had been completed, and that it was now available for immediate occupancy.

In order to make a more detailed study of fading of vertical-incidence transmissions, the received field of WWI at 4324 kc were recorded using the "dot printing" Brown Elektronik recording potentiometer. Records were taken, both with the regular printing rate of once each fifteen seconds and with the printing mechanism modified so that a print could be made approximately each four seconds. A microswitch was installed to stop the movement of the carriage and printing wheel during the actual print time.

Magnetograph calibrations were performed and new K scales calculated on the following dates: July 28, August 2, and August 18.

<u>Date</u>	<u>Sensitivity Change</u>
July 28	3.33 to 3.41 gammas per millimeter
August 2	3.41 to 3.184 gammas per millimeter
August 18	3.184 to 3.186 gammas per millimeter

Tests were made on two type BC-348 receivers; the results show that the avc response was not satisfactory for field-intensity recording where the rf voltage at the receiver drops below 10 microvolts. Certain modifications were made, however, and preliminary results indicate that a minimum amount of scale spread can be obtained.

High-Frequency Standards (Section 8) - Measurements and calculations were made through 7800 kc on the standard field produced by a balanced versus an unbalanced coil using a so-called balanced output generator. The output of the generator was found to be badly unbalanced from about 1200 kc up, but the data did not indicate errors from this source in the Federal field-intensity meter used for the tests.

The dielectric constants of the consolidated sandstone specimens from the Bureau of Mines were measured in the frequency band of 1 kc to 30 Mc at an ambient temperature of 24°C and a relative humidity of 49%. The average dielectric constant varied by a factor of about 2 over this frequency range. Measurements were also made at 1 kc with the specimens dry. Here the average dielectric constant was found to be nearly the same as the 30-Mc value at 49% humidity indicating that this amount of moisture no longer affects the dielectric constant at 30 Mc.

To compare more carefully the "standard antenna" and "standard field" methods of determining field intensity at 100 Mc, it was necessary to measure ground constants at the field-test site. This was done at vertical incidence using the standing-wave method. It was found possible to measure