1948 RCA FIELD TEST OF UHF TELEVISION

A field test of ultra-high-frequency television was conducted by RCA and NBC in the Washington, DC area during the fall of 1948. A picture transmitter and a sound transmitter, together with a high-gain transmitting antenna, were installed at the Wardman Park Hotel. Transmission was on 505.25 megacycles for picture carrier, and 509.75 megacycles for sound carrier, the effective radiated peak power for picture transmission was 3625 watts, with 3625 watts average power for the sound transmission.

Two types of converters were designed and constructed for these field tests. More than fifty converters and appropriate receiving antennas were installed in homes having conventional receivers.

A field intensity survey was conducted and the results were analyzed in terms of coverage.

At each of the home locations, voltages corresponding to the ultra-high-frequency transmission and to the transmission of WNBW on Channel 4 were measured.

The Model A converter had a tuning range from 480 to 800 megacycles, while the Model B converter had a tuning range from 480 to 600 megacycles. Both models had self-contained power supplies and both models converted ultra-high-frequency television signals down to Channel 3 on a standard television receiver.

The noise factor for the Model A converter, using a crystal mixer, was 10 decibels above thermal noise, and the corresponding factor for the Model B converter was 22 decibels above thermal noise.

Installation of converters and receiving antennas started shortly after the beginning of transmissions on September 1, 1948. During that month, 35 Model A converters and 16 Model B converters were installed in the Washington area. Of these installations, 47 were accompanied by an antenna installation, which appeared to be appropriate for the particular set of circumstances. These included 3 dipole-director arrangements, 5 broad-band unidirectional arrays, 15 rhombics, and 24 fan dipoles. In each case, the installation crew tried a variety of antenna positions and well as the various antenna types. The predominance of the fan dipoles was due to two factors. Where a satisfactory picture could be obtained with the fan dipole, it was selected because of its simplicity. In many other instances, particularly in the shadowed areas, it was often found that the fan dipole gave at least as strong a signal as the directional antennas. The rhombic antenna often gave results superior to any other type and was used in those instances. In some of the shadowed areas it was inferior to the fan dipole, but in at least one extremely obstructed position it was far better than the other antennas. The dipole-director was found to be of little value in any location.