ASSIGNMENTS

Radio officers assigned Mackay Radio, New York:

Yorba Linda—T. J. Burns
Shawnee—P. B. Kimball (Jr.)
San Jacinto—E. H. Cole (Chief)
Black Osprey—R. C Horscroft
Manhattan—F. W. Kent (4th)
Manhattan—W. E. Smith (5th)
Thos. P. Beal—J. J. Bamberg
Sage Brush—A. Adamson
Cherokee—T. J Cain (Jr.)
W. R Keever—C. R. Hamilton
Scanpenn—H. Weinstein (Chief)
Edouard Jeramec—H. McGoldrick (Ch.)
Edouard Jeramec—M. Gardiner (2nd)
Edouard Jeramec—R. C. Williams (3rd)
City of Fairbury—W. R. Weber
Shawnee—A. Sopko (Jr.)

Short Wave Programs for Waldorf Guests

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proximate lengths of 12.5, 25, and 50 meters, arranged as shown in the illustration at the head of this article. This arrangement permits reception of all frequencies from 2200 to 25,000 kilocycles except for a slightly lower response over the narrow range 3600 to 4800 kilocycles. This low frequency range is extended and re-enforced, however, by using the vertical lead-in wire from the horizontal doublets as a vertical antenna. Such an arrangement, with the lower end of the vertical antenna connected to ground through the coupling transformer, acts as a vertical doublet with its lower half buried in the ground, and responds to odd multiples of wave-lengths of four times its length. By suitable "loading" the effective length of this vertical section may be considerably modified and, as arranged at the Waldorf, the vertical section of about 100 feet which is "loaded" by the doublets responds to frequencies of 800, 2400, 4000, 5600 kilocycles, etc. By design, however, the response of this vertical section to frequencies above 6000 kilocycles is progressively nullified in the special coupling transformer to the radio-receiver transmission line.

The manner of covering the wide frequency range by these horizontal doublets and the vertical half doublet is indicated in Figure 3. Here the odd-multiple response frequencies of the various antennas are indicated by the vertical lines, while the horizontal lines indicate the frequency range brought in, allowing a 20 per cent spread on each side of the multiple frequencies. The vertical lead-in consists of two wires twisted together—one wire being connected to each half of the horizontal doublets. The current from the horizontal antennas comes down one of these wires and up the other, thus traversing the vertical section in both directions. The current induced in the vertical section, however, travels in the same direction in both conductors. The special transformer at the foot of the vertical lead allows both of these currents to be fed to the radio apparatus, but shuts off the higher frequencies from the vertical part of the antenna.

Most transmitting antennas are effectively vertical rods, and the waves they emit are vertically polarized—providing the greatest effects on vertical receiving antennas. In traveling great distances, however, these waves undergo a series of reflections between the earth and the ionized regions of the upper atmosphere. By this multiple reflection their vertical polarization is changed to an elliptical polarization, with the result that they may produce even greater effects on a horizontal antenna than on a vertical one. For this reason the horizontal structure used at the Waldorf is very sensitive to waves coming from remote points, where because of the great distances involved the greatest sensitivity in reception is required. This form of antenna will also minimize interference by nearby stations, the waves of which are vertically polarized. It happens, moreover, that the waves from most man-made sources of interference affect a horizontal doublet much less than a vertical antenna. Most of this form of interference is at the higher frequencies and thus does not prove objectionable over the range from 2000 to 6000 kilocycles where the vertical section of the antenna becomes effective. Stations operating at these lower frequencies are for the most part local, representing mainly police, aviation, and amateur radio telephone channels. These waves retain sufficient of the vertically polarized component to be readily picked up by the vertical antenna.

Fig. 5—In the intermediate-frequency amplifier, shown undergoing inspection by F. Stevens, Radio Technician of the Waldorf, the power of the signal is increased a hundred thousand million fold

This multiple-antenna system is thus highly suited to picking up high-frequency signals coming from great distances and lower frequency signals from nearby stations, both with a large signal-to-noise ratio compared to vertical receiving antennas. The effectiveness of the antenna is further enhanced, however, by taking advantage of the directional characteristics of a horizontal doublet. Greatest sensitivity is obtained for waves arriving in a direction at right angles to the doublet. In Figure 4 is a map of the world in gnomonic projection centered at New York. The distinguishing feature of such a scheme of projection is that a line joining New York and any part of the world lies in the true direction over which radio waves would travel. The horizontal antenna system of the Waldorf—considerably enlarged in scale—is superimposed on this map at New York, and it is at once evident that waves from most of the international broadcast stations would reach the antenna from a favorable direction. The end-on directions of the antenna are toward the South Atlantic and North Pacific oceans where there are practically no stations, but even end-on, the antennas have some response because the short-wave signals arrive at a slight angle above the horizontal.

With these facilities the Waldorf is now in a position to offer its patrons short-wave radio broadcast programs of a high order of merit. Short-wave stations in London and Daventry, England, in Paris, France, in Madrid, Spain, in Koenigswusterhausen, Berlin, Germany, at Rome and in the Vatican, can be as readily heard as local broadcast stations under favorable conditions. Even the short-wave stations in remote locations such as Moscow, Tokyo, Rabat in Morocco, Melbourne in Australia, and the various South American stations will at times be available for instruction and amusement.