



**ISOTRON 20/15/10
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SO SIMPLE AND SO RUGGED!**

GETTING AN HF ANTENNA TO WORK. 9

The last article was describing the use of a Noise Bridge. This device is connected directly to the antenna. It will identify the resonant point and the Radiation Resistance at that frequency. The resonant point is the most important part of the tuning and this is adjusted by the length of the antenna generally. On the Isotron's it is a capacitive adjustment. However what can you do about the R value when it is not 50 ohms? (The R value referred to is the reading on the Noise Bridge or Radiation Resistance of the antenna).

Using a dipole, vertical or Isotron, the R value in general can range from 20 to 250 ohms. How can this be adjusted to 50 ohms?

The R value is much affected by the antenna's environment. The conductivity of the earth under the antenna is a big factor. In most cases, the shield side of the coax is considered the ground side of the antenna.

Therefore if you stretch out a dipole, one half is the shield side (considering no balun). The shield side is affected by the ground conductivity. This is one of the reasons that a dipole increases

in Resistance (R) with an increase in height. On the other hand a vertical will have a low Resistance with the radial system used.

To lower the R value of an antenna, the shield side needs more conductivity to ground. In the April issue it was recommended to mount your antennas on a metal pole. This pole in turn is grounded to the earth. Keep in mind the pole is much larger than a wire and will develop a much lower Inductive reactance. Therefore securing the coax to the pole up to the antenna will have the affect of lowering the R of the antenna. If it needs to go lower, then you can actually ground the shield side of the antenna to the pole.

Doing this can lower the R value too low. However this is easy to fix. Use a small capacitor (about 100 pf) to ground the antenna to the mast. You will see the R reading on the Noise Bridge increase from fully grounded.

This is how we adjust the R on the Isotron (just a little propaganda).

With a vertical it is not as adjustable. If your radials are above ground you can try releasing it from the earth ground, but it may have only a few ohms difference.

Keep in mind, if the antenna is resonant, the antenna is most likely working at full efficiency. With the R value differing from 30 to 200 ohms off of 50 ohms, the loss is hardly noticed if matched at the radio with a Tuner.

This will also be true in expanding the Band width of the antenna. For most antennas, once you have the Resonant point in the band you are using, adjusting the Reactances (X) and R with a Tuner will result in little signal loss.

Next article will continue on setting up the antenna in a more difficult installation.

73,
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