A Multiband Groundplane Vertical Antenna with Tuned Feeders

Who says tuned feeders are used only with horizontal wire antennas? Go multiband with a simple vertical radiator by using a tuned-feeder system — and do it with ease!

For several years, the author has experimented with several versions of this antenna and has found them to be most satisfactory. The antenna shown in Fig. 15 provides not only outstanding performance on 10, 15 and 20 meters, but performance on 40 and 80 meters equivalent to most mobile-antenna installations. Full efficiency on these latter bands can be realized by making the vertical and radial portions proportionately longer.

The antenna system consists of the radiating element, groundplane radials, an open-wire feeder of any convenient length, a Transmatch capable of either series or parallel tuning, and an antenna SWR bridge. This combination is shown in Fig. 16.

Antenna and Radial Lengths

The author preferred to cut the antenna for resonance on one particular ham band (20 meters), but it is not necessary that the antenna be resonant on any band. Efficiency will suffer, of course, on bands where the length is significantly shorter than one-quarter wavelength. Whatever the length chosen for the antenna, the radials should be of about the same length.

Construction

Constructional details are shown in the sketch of Fig. 15. In the event the specified aluminum tubing is not available, thin-walled galvanized electrical conduit, aluminum conduit, or copper pipe may be used.

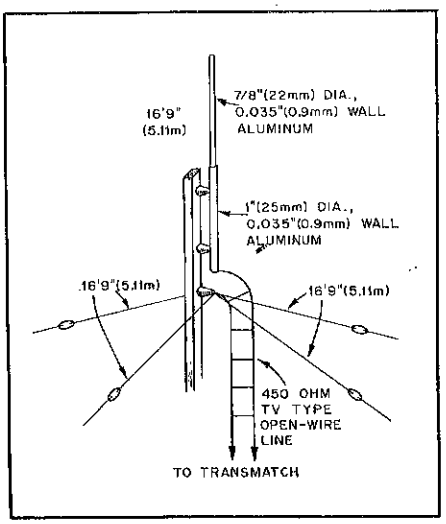

Fig. 15 — Sketch of W4VON's simple multiband antenna.

It is recommended that the vertical element not be supported by drilling holes through the tubing, as this will substantially weaken the structure. An alternative mounting arrangement is shown in Fig. 17. The insulators are porcelain standoff types with a lag-screw insert. They will be found at electrical supply houses (also at Sears), and are sometimes referred to as "saddle" type insulators. The hose clamps are stainless-steel gear type.

Adjustment

Operation of the antenna is simple. The Transmatch (a suitable one, including SWR bridge, is described in the ARRL *Handbooks)* and SWR bridge are connected, and the tuning network adjusted for maximum forward and minimum reflected power. Initially, it will be necessary to determine experimentally whether series or parallel tuning is required for the particular combination of band, feeder length, and antenna length selected.

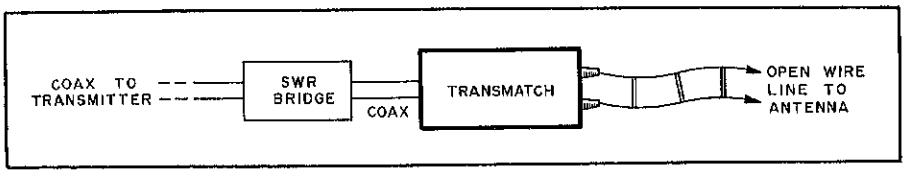

Fig. 16 — Recommended setup for coupling antenna line to low-impedance transmitter output.

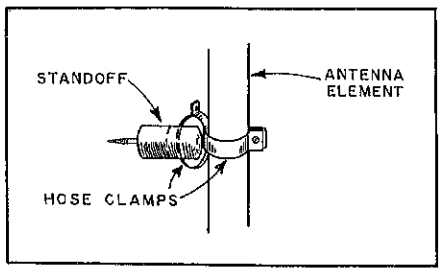

Fig. 17 — Suggested method of mounting radiator element without drilling holes in aluminum tubing.

The tuned-line-fed groundplane vertical antenna gives excellent performance, can be easily constructed in just a few hours even by a beginner, requires a minimum of installation space and costs less than $5, excluding the Transmatch and SWR bridge. The tuned circuit of the Transmatch provides excellent discrimination against harmonic output from the transmitter. Ease of construction and portability make this antenna an ideal one for Field Day use.

In case one wonders about the mismatch between the line and the antenna, the secret is in the use of open-wire line. The loss in such a line with an SWR of 25:1, at 10 meters, is less than the loss in RG-58/U when the latter is matched. This material was originally presented in *QST* by Arthur S. Gillespie, Jr., K4TP.

Extrait du livre : The ARRL ANTENNA ANTOLOGY édition 1978