A vertical approach

I have made the assumption when writing this article that about 60 feet of garden are available. Of course there are many people who will have to make do with rather less than this. Please don't despair. It is a repeatedly observable fact that even the smallest, most inefficient antenna system will radiate some RF and that contacts, occasionally surprising ones, will be made regardless.

The all band system with perhaps the smallest area requirement is undoubtedly the trapped vertical of the H5V, 18AVT type. This type of antenna is markedly more efficient on the higher bands than the lower ones where the radiation resistance is very low and the tuning critical at the LF end. However it does have the advantage of a reasonably low radiation angle on all bands offering the possibility of some DX working from an otherwise poor QTH. This type of antenna should be attached to a really good earthing spike, at least three feet long driven into damp ground or, alternatively, operated with a radial system with a minimum of two radials per band.

It is possible to broaden the bandwidth of this type of antenna by connecting it to the transmitter through a standard unbalanced ATU. Although the SWR between the ATU and antenna will be high at the band edges it should be possible to let the transmitter 'see' a one to one match.

Generally speaking though a wire antenna will show slightly better performance on the lower bands than a trapped vertical, particularly if the main interest lies in local working. If the decision is made to go for a wire aerial then the only rule is to get out as much as possible as high as possible over the maximum amount of ground area available.

MHz, a good low resistance earth connection is required. A suitable counterpoise wire may, of course, be used in place of the HF earth connection, but in practice, there may be objections to such a wire, supported at a suitable height of 7 or 8 feet above ground across the garden being used. If a counterpoise is used, it is still essential that the equipment be connected to earth, even though this may not be what is considered an effective HF earth, to safeguard the operator in the event of electrical failure in the equipment causing dangerous voltages to appear on the chassis and cabinet.

The Half Size G5RV Antenna

Although the writer strongly recommends the use of any convenient length of 75 ohm twinlead or, even better, open-wire feeder from the output of the ATU to the base of the 17 foot open-wire matching section (see **Fig. 1**), it is recognised that, for a variety of reasons, many amateurs prefer to use 50 or 80 ohm coaxial cable. For this reason, the arrangement shown employs this type of feeder. Thus, the type of ATU required is the unbalanced-to-unbalanced type and one suitable form is shown in **Fig. 2** and the component values for 3.5 to 28 MHz are given in the caption. This type of ATU is also suitable for use with an end fed antenna from 3.5 to 28 MHz. On each band, the ATU should be adjusted by selection of optimum values of C_1 and C_2 and of L, so as to obtain the lowest possible VSWR on the length of coaxial cable between the output of the transmitter and the input of the ATU. The use of a suitable 50 or 80 ohm VSWR meter is essential for correct operation of the antenna and feeder system. On all bands except 28 MHz, the VSWR on the coaxial feeder from the *output* of the ATU to the antenna will be moderate to high. However, the losses in the relatively short length of feeder employed in a small garden will quite acceptable — a fraction of 1 dB only. On the 28 MHz band, the coaxial feeder will 'see' an almost non-reactive 80 to 90 ohm load at the base of the matching section. The use of 50 ohm coaxial

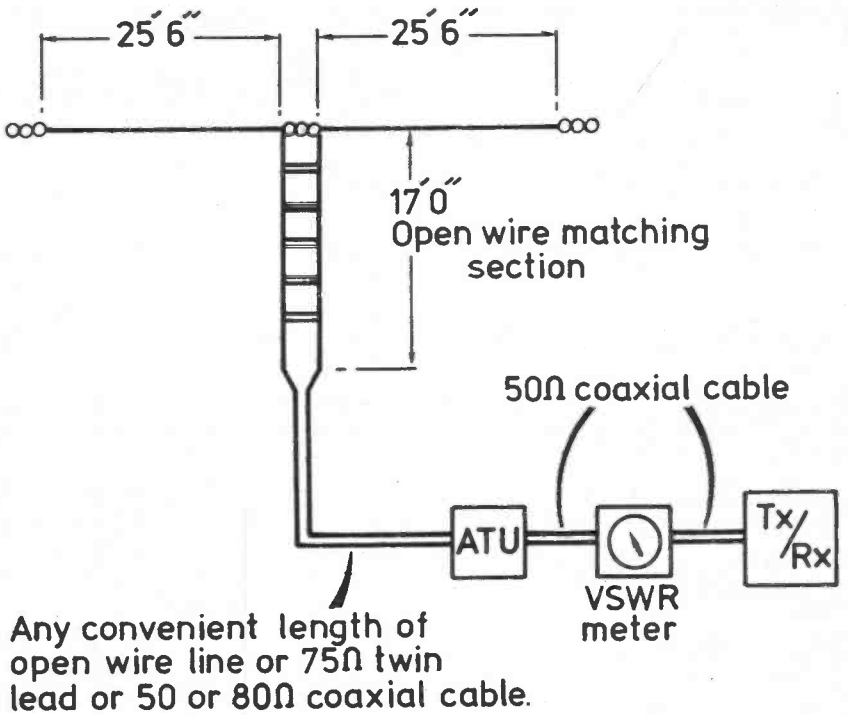

Fig. 1. The half-size G5RV antenna. Arrangement for use on 7 to 28 MHz bands.