cable feeder will therefore result in a VSWR of approximately 1.8:1, which is quite acceptable even when using a transistor output stage in the transmitter having a wideband untuned output circuit which requires to work into a load representing a VSWR not greater than 2:1. The use of 80 ohm coax will result in a 1.2:1 VSWR. However, although the antenna and feeder system will work satisfactorily on this band without the use of an ATU, its use is recommended since it will also improve the front-end selectivity of the receiver, giving useful reduction of cross-modulation effects. On 1.8 MHz an 'L' network ATU is more suitable and is described below.

The End-fed Wire Antenna

This may take the form of the typical 'L' antenna and, if necessary, the far end may be allowed to hang vertically, or at some convenient angle to the horizontal top, for up to about 10 or 15 feet without seriously affecting its performance. This antenna also requires the use of a suitable ATU a 'T' network as shown in **Fig. 2** for 3.5 to 28 MHz and an 'L' network for 1.8 MHz. However, since on the 1.8 MHz band this antenna of 100 feet overall length represents something between one eighth and one quarter of a wavelength, it may be found better to dispense with the capacity of the 'L' network and simply use a suitable value of inductance in series with the antenna so that the wire plus the coil represent a λ/4 antenna electrically. This may be done, effectively, by setting the 'L' network condenser at minimum capacity and adjusting the number of coil turns in use (by suitable taps) until the lowest VSWR on the coaxial cable from the transmitter to the input off the simple coil ATU is obtained. **Fig. 3** shows the 'L' network and the component values are given in the caption.

Comparative Performance

Both the antennas described have been tested over a period of about six weeks and, by means of a rapid switching facility, received signals on the various bands (except 10, 18 and 24 MHz) have been compared both by S meter and by ear with those from a full-size G5RV antenna. On 1.8 and 3.5 MHz a difference in signal strength of one to two S points in favour of the full size G5RV antenna has been observed, and this is what one would expect. However, it must be said that the full size G5RV antenna was supported at a height of 35 feet whereas both the half-size G5RV and the 100 feet 'L' antennas were supported at only about 25 feet at the house end, the half-size G5RV sloping to 20 feet and the 'L' antenna to 8 feet above ground level at the far end. From observations on received signals and reports received on transmitted signals and taking into account the height advantage of the full-size G5RV antenna, these observed results would appear to be reasonable. However, from 7 to 28 MHz the half-size G5RV and the 100 feet long end-fed wire 'L' antenna both performed very well indeed and, despite the height advantage of the full-size G5RV antenna, the observed difference in signal levels was usually nearer one S point. ●

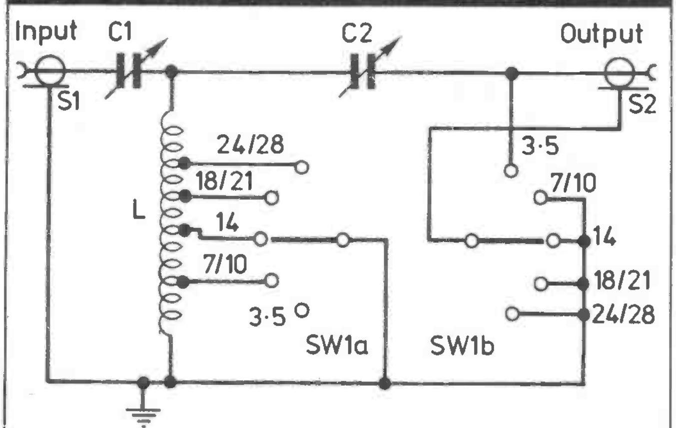

Fig. 2 The T network ATU for use with the half-size G5RV or the end-fed 100ft antenna on all bands from 3.5 to 28 MHz.

Component Values
L Total of 22 turns of 18 SWG enamel copper wire close-wound on a 40mm ID former. Tape, counting from earthed end of coil:—
7/10 MHz 8 turns
14 MHz 5 turns
18/21 MHz 4 turns
24/28 MHz 3 turns
C1, C2 160pF max. capacity. Receiver type for powers up to 100 W. PEP output.
S1, S2 Type S0239 coaxial sockets.
SW1, SW1b, each single pole, 5 way wafer switches ganged. Ceramic wafers preferred, but not essential.

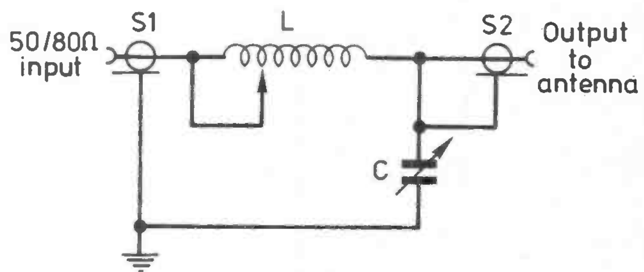

Fig. 3. The 'L' Network ATU for use with the half-size G5RV or the 'L' antenna on 1.8 MHz.

Component Values
L Approximately 14 turns 18 SWG enamel copper wire close wound on 40mm ID former. Optimum number of turns to be determined by trial and error.
C 160pF variable, receiver type. (May not be required).
S1 and S2 Type SO239 coaxial sockets. (Note that S2 has outer and inner connected together. This socket must be insulated from the metal cabinet or front panel of the ATU.)