

Practicalities

An occasional series

By Ian Poole G3YWX

Very often in the field of amateur radio a few practical hints and tips can save a great deal of time wasted in finding out why a particular circuit does not work or in experimenting in finding out the best way of tackling a problem. It is hoped that it will be possible here to pass on a few practical ideas to cut down this time spent on wild goose chases and also to improve the overall results and appearance of the finished projects.

ATU coils

One piece of equipment which almost any amateur station will possess is an ATU to match the aerial system to the transmitter, reducing SWRs and increasing the power transfer. SWRs below 2:1 can easily be tolerated as the output stages will normally withstand this sort of mismatch and it only represents a power loss of 0.5dB. However, as the SWR increases damage to the PA transistors becomes more likely if no protection is provided, or if valves are used excessive dissipation within the valve will cause reduced life. In addition to the possibility of PA damage, as the SWR increases so the efficiency falls, making some form of matching unit essential for most aerial systems. The availability of the parts for ATUs is becoming increasingly poor. While little can be done about such components as the switch and the variable capacitor, it is possible to make a very acceptable coil former which cannot only operate well but can also look very professional. The actual former is constructed from a length of one and a half inch plastic waste pipe about six inches long which can be obtained from almost any

plumber's or DIY shop. Next a helical groove about 1/10th of an inch deep should be cut with a pitch of approximately ten turns per inch to take the wire which should be 18 swg or thicker. This can be done either on a lathe if there is access to one or a friendly lathe operator, or by carefully using a file. For the coil to be incorporated in a circuit such as that shown in Fig. 1 about 40 turns should be sufficient. Two holes can be made in either end to terminate the wire as shown in Fig. 2. Taps should be placed at intervals of

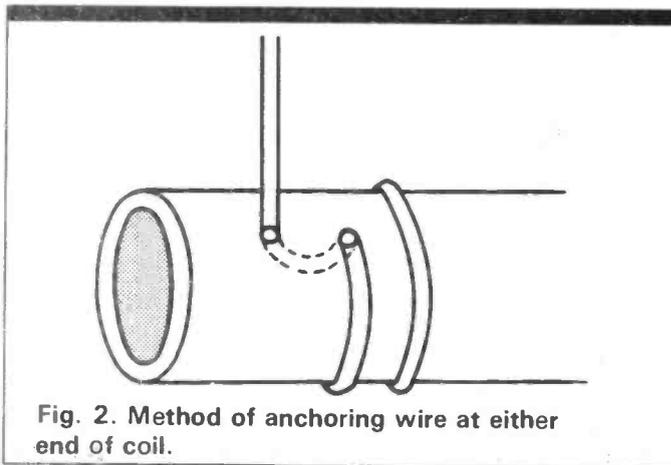


Fig. 2. Method of anchoring wire at either end of coil.

one turn for the first few turns and then slowly increased. The actual positions of the taps can be altered if there are not sufficient positions on the switch after the unit has been tested in order to obtain the best SWR.

A simple check for transistors

Most of us will have been in the situation of requiring a simple and quick check for a transistor. While there are several transistor checkers on the market they will tell us far more than we normally need to know, besides which they cost money! Several years ago I learnt a very simple check for the basic functioning of a transistor which despite its simplicity has not yet let me down. If one looks at the basic construction of a transistor as shown in Fig. 3 it can be seen that there are two PN junctions which can be represented as shown in Fig. 4 for the purpose of this test. While the example shows an NPN transistor the same will hold for a PNP device except that the polarities will be reversed. It is now an easy matter to check the

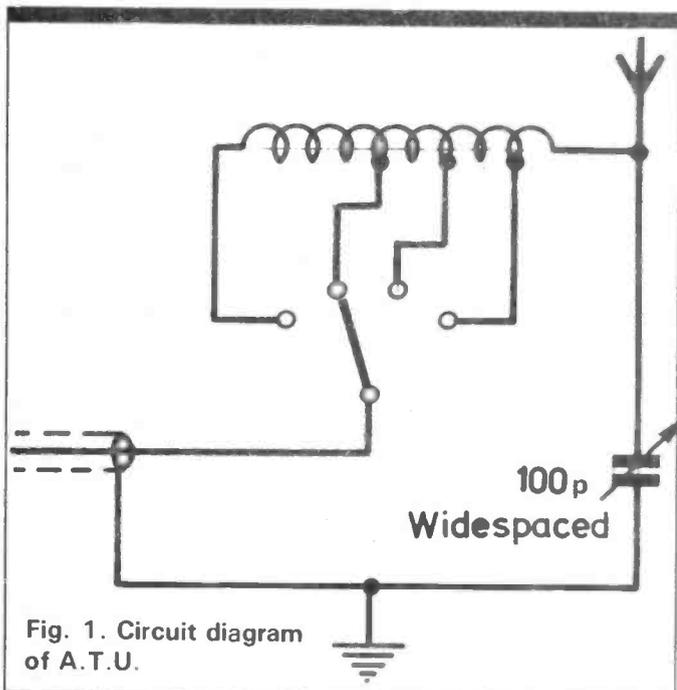


Fig. 1. Circuit diagram of A.T.U.