meter should show a 1:1 ratio at all frequencies. Checking at 1.8 or 3.5MHz and then on 28MHz should be sufficient to prove this point. DON'T operate the coaxial switch when transmitting!

Wires

Many amateurs seem loathe to experiment with wire antennas, without any good reason. It could stem from their early days studying for the RAE, with books and manuals showing antennas with lovely straight elements, perfectly horizontal, feeders coming away at right angles and of exactly the right length, or the large expanse of lawn under which hundreds of feet of radials must be buried before one can hope to get out on Top Band. Very nice, of course, but really one can get out and work the DX with a lot less perfection.

Having decided on a particular design for an antenna, preferably not too complicated at the start, have a look at where the maximum current will occur on the principal band on which it will be used, assuming it to be a multiband design. The object in life then is to get that part of the antenna up as high as possible and preferrably as far as possible from nearby buildings or obstructions. While the feeder should be kept as short as possible don't forego a good position for the antenna for the sake of a shorter feeder.

Taking **Fig. 3** as an example, if the centre third of the wire is as high as it can be then the ends can droop down vertically, or be part of the guying system, with the centre portion sloping down from a single suspension point such as the top of a pole. Such an arrangement is often called an "inverted-vee" which it is not. If the wire is straight and reasonably horizontal then, if it is a half wave long, the radiation will be mainly at right angles to the line of the wire. If the ends do droop then the pattern of radiation, or polar diagram, will be modified somewhat.

Construction

The cost of experimenting with wire antennas is virtually nothing although it does depend to some extent on whether you are transmitting or just receiving. If transmitting then a little more attention needs to

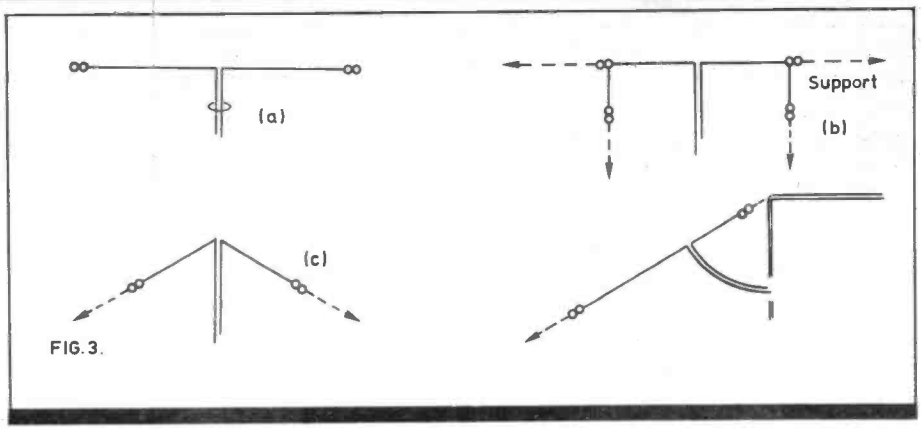

FIG. 3.

Fig. 3 (a) the perfect textbook antenna, in space unaffected by supports or nearby buildings etc. (b) down to realities with as much of the antenna in the clear as possible, with cords to adjacent supports as convenient. In practice it may not even be possible for the antenna to be horizontal at the centre. (c) Both sides of a dipole may be taken down towards the ground, again using any anchoring point available. The included angle at the top should not be less than 90 deg. (d) Wires can slope to fit the site

be paid to the adequate use of insulators at the ends of wires where high voltages appear, and which MUST be kept well clear and out of anyone's reach.

The more usual egg insulator, or expensive pyrex glass equivalent, can be replaced by a piece of plastic tubing a few inches long, with holes drilled at least 1in in from the ends, for anchoring the wire antenna and the supporting rope or string. A similar piece of tubing can be used at the centre of dipoles and the like although a piece of flat plastic is more appropriate, **Fig. 4**. Keep an eye open, especially in offices, for the cast-off bodies of so-called "glue pens" which are ideal for insulators. An insulator must always be used between any point on the wire and a support. There are those who would use nylon string or rope tying it direct to, say, the end of a wire antenna, but I still prefer to be sure of the insulation, especially in wet weather, and fit an insulator.

If open wire feeders are to be used their construction is quite simple, **Fig. 5**, using the discarded bodies of ball point pens for spacers. They are very light in weight and not unsightly. A small hole is drilled near to each end for the thin wire used to attach the spacer to the feeder wire. This method of construction allows the feeder to move about in the wind avoiding wire fatigue and breakage which can occur with a more rigid construction. Generally such open wire feeders will be part of a tuned system so the spacing of the feeder wires is of no great importance, so between 4 and 6in is the usual spacing. The binding wire can be the aluminium wire used around the garden for supporting plants etc and there is also a similar green plastic coated iron wire which is quite suitable.

Actual construction of open wire feeders is best undertaken outside where the two wires can be stretched out straight, tying one end of each, about the correct distance apart, to a convenient support. The spacers are fed on at the other end of the feeder and spaced out roughly at about 2ft intervals. Cut a stick of wood to about 2ft long and use this to adjust the spacing apart fo the spacers as they are wired on to the feeders. There is nothing more unsightly than open wire feeders with spacers at random intervals!

Taking feeders through window frames can sometimes be a problem but for low impedance types a suitably sized hole may be drilled through the frame, perhaps at a point that can be out of sight behind a curtain. Always drill the hole so that it is sloping downwards from the inside to th eoutside and thus prevent the ingress of rain etc. Some form of plastic filler will come in handy here. For open wire feeders the ball pen bodies can be pressed into service once again, making