Novice Note Book

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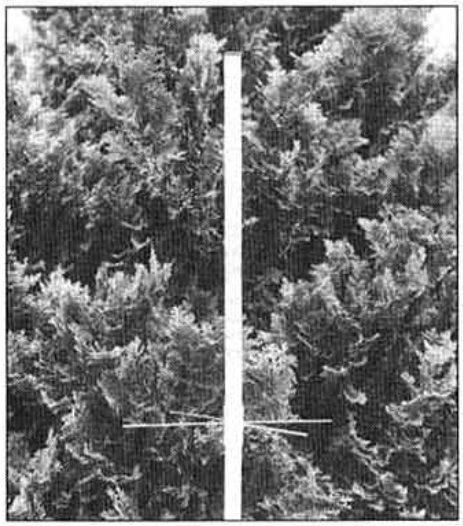
NOW THAT MARGARET my wife has obtained her Novice Licence (2E1DFH) serious consideration was given to getting onto 70cm from the house. It was decided that another handheld to complement my old KT44 would be the ideal solution.

The problem was what antenna to use? I tried building a Slim Jim, but did not like it because of the unbalanced feed point; I then converted it to a J-pole which seemed to work well until I knocked together a simple ground plane antenna. I realised that the construction was far more simple and there seemed to be little difference between the two. After further thought on the subject I realised that it would be nice to have some gain to overcome the losses in the feeder. After all, at these exhalted frequencies, the like of which I have not known for many a year, even short lengths of very good feeder can have high losses.

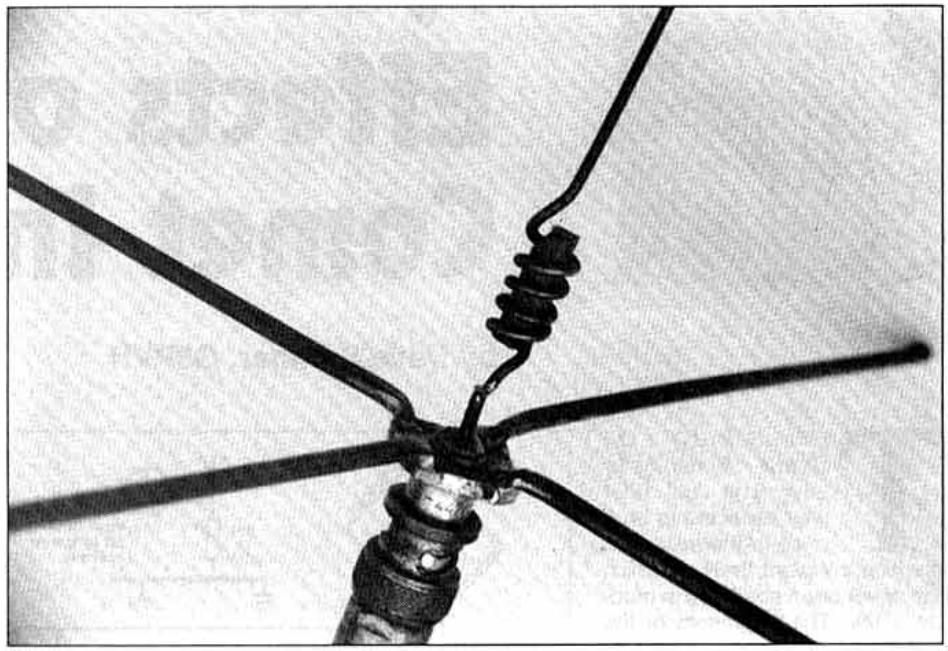
A 5/8 λ VERTICAL ANTENNA

A 5/8- WAVE ANTENNA with a base loading coil to make it look like a 3/4 wave to the feeder might be the answer. I used a length of 1.5mm welding rod, marked off a little over 5/8 wavelength and then wound five turns on a 4mm drill shank. The end was then filed down to a tapered point and this was soldered into the centre conductor of a BNC socket (I always use BNC sockets with PTFE insulation as I always manage to damage the insulation of the cheaper sockets).

The coil in the base made the antenna very 'whippy'; this was overcome by cutting a short length of plastic knitting needle, 5mm in diameter, and forcing it into the coil. The structure is shown in **Fig 1**. Four lengths of 3mm welding rod had already been cut, bent and soldered into the four mounting holes of the socket and then cut to length to form a radial system when I was experimenting with the 1/4-wave ground plane.



The completed antenna in its plastic tube.



The 70cm, 5/8- wavelength, vertical antenna showing construction details.

On testing, the standing wave ratio was found to be 1.6:1, which was very good as I had only guessed the base coil! I then trimmed off 3mm at a time from the tip of the aerial until the SWR dropped to 1:1.

I had already cannibalised the ground plain antenna to make this 5/8-wave version and so could not do comparative tests, but I still had the J-pole complete. Against this there was a distinct advantage when using the 5/8 wave antenna.

The next job was to make the structure waterproof. For this I used 22mm PVC waste water pipe of the 'weldable' variety, which is easily available at plumbers' merchants, and can usually be purchased by the metre. A coupler was slotted to take the radials, and the BNC socket filed as required so that it would slide down the inside of the coupler, with the radials poking out of the slots.

A length of tubing was cut 30mm longer than the antenna and this was pushed into the plastic tube coupler. A plastic bung was used to close up and waterproof the top end; a plastic screw-top may be used instead. Plastic welding solution was then applied to the joins and the antenna was then finally sealed in the plastic tubing and allowed to set. A hint at this point is that as the coupler has been slotted to accept the radials, it is worthwhile taping this weakened joint firmly with PVC tape until the welding solution sets.

So that the antenna can be erected I used an off cut of tube pushed into the bottom end of the coupler and held with a self tapping screw. This made an ideal mount and my new 70cm antenna was then positioned above my TV aerial using nylon cable ties to hold it in place.

HINT FOR THE MONTH

PLASTIC KNITTING NEEDLES can be used in various ways such as coil formers, stand-off insulators under PCBs and spreaders in a home-made twin feeder.

COMPONENTS LIST

1 four-hole mounting BNC socket
1m length of 3mm brazing rod
1m length of 1.5mm brazing rod
1m length of 22mm waste water pipe
1 22m Straight coupler
Plastic welding solution
Brazing rod (may be available from a small local garage)

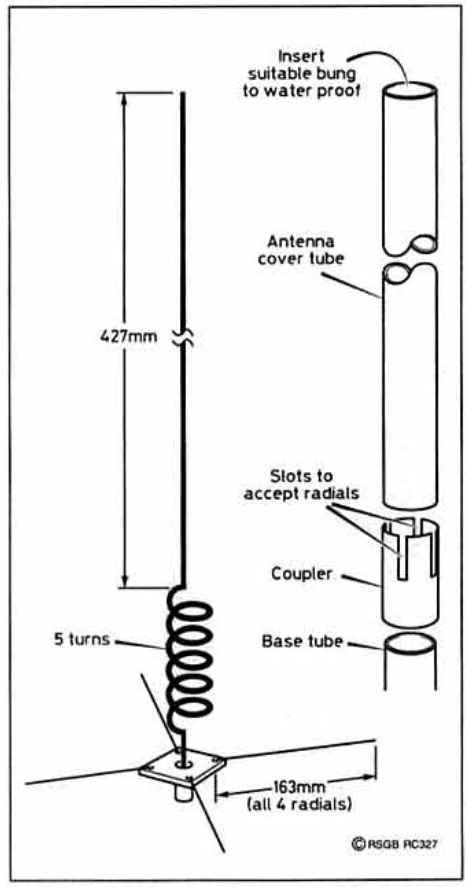


Fig 1: Construction of the 70cm vertical antenna.