swing. The DX performance of G3ZZD on 40m was improved drastically; DX stations could be worked on the vertical which were almost inaudible on the horizontal dipole. Western America and Australia were worked around sunrise with 10 watts of CW while daytime signals from the UK and Europe were only about 6dB down on the performance of the dipole. No deterioration was noticed in the omni-directional properties of the vertical antenna due to the bent and far from assymetrical radial system. It should also be noted that the soil at G3ZZD, while being clay, extends only to the depth of 1m and is hardly the ideal 'earth'.

For those with a healthy bank balance aerials of this kind may be purchased for some £60-100 and giving coverage of 80-10m for instance the popular Hygain 18AVT. I, however, had very little money at the time and also harboured notions of 160m operation. Could I not build a trap aerial myself to cover 160, 80 and 40m — with as much vertical in the high current portion (which does most of the 'radiating') as possible? After some thought the antenna shown in **Fig. 4** was constructed.

The resulting 'inverted L' aerial is an electrical quarter wave on each band and was fed against an earth system consisting of three, 1m length earth stakes, two ¼ wave radials for each 80 and 40m and a single ¼ wave radial for 160m. Figure 5 shows the trap should be adjusted for resonance at 3.7 MHz with a grid dip oscillator before weatherproofing with varnish. The radials were once again stapled to convenient garden fencing.

The 9.5m vertical section of the aerial was constructed from lengths of 2.5cm diameter copper-coated steel tubing, bought as a government surplus 'golf bag' vertical aerial. Aluminium T.V. mast type tubing could be used instead. The sole support for the vertical section is one of the larch pole masts. The halyard from the larch pole was attached to the vertical section at a point corresponding to the height of the larch pole. With the base of the vertical section held firmly in place at the base of the larch pole, the vertical section of the aerial was walked upright and the halyard pulled taut. The halyard was then wound in spiral fashion around the vertical section and larch pole, about ten times, and secured at the base of the larch pole. This arrangement stood three seasons of spring gales before being dismantled still intact.

A wooden fencing post was driven into the ground at the base of the vertical section. After the base of the vertical section had been very liberally wrapped in a layer of plastic insulating tape (at least 3mm thick) it was attached to the protruding part of the fencing post with a universal mast coupler. There should be a space of 5-7cm between the vertical section and the larch pole. As the aerial is current fed in 160, 80 and 40m the RF voltage at the base of the vertical is low and the plastic tape acts as an effective base insulator. The aerial is fed directly with 50 ohm co-axial cable (RG8/U), attached to the base of the vertical section with a 3cm jubilee clip (see **Fig. 5**).

The completed aerial was first adjusted for minimum SWR in the centre of the 40m band by altering the short length of wire between the top of the vertical section and the 7.1MHz trap. The section between the 7.1MHz and 3.7MHz traps was then altered for minimum SWR in the centre of the 80m band. Finally, the 13.5m section was altered for minimum SWR in the centre of the 160m band. Alterations of this section may have some small effect on the SWR on 80 and 40m, but this should not be serious enough to warrant any further alterations to the antenna. An SWR of under 2:1 was obtained across 160 and 40m and most of 80m.

Results with this antenna were excellent — and it cost less than £12 to build! The performance on 40m appeared slightly superior to that of the commercial trap vetical I had been loaned. On 80m the DX performance was superior to the low dipole by at least one to two 'S' points. Good reports were also received from Europe and the UK. On 160m signal reports of 5 & 8/9 were received from all around the UK, using 25W pep of SSB. ●

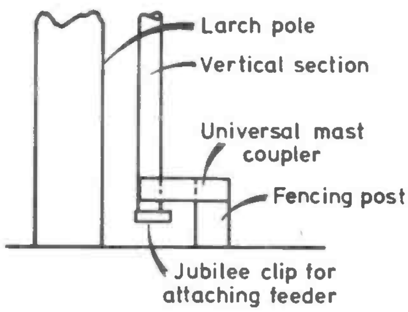

Fig. 5. Base of vertical section on insulated fencing post

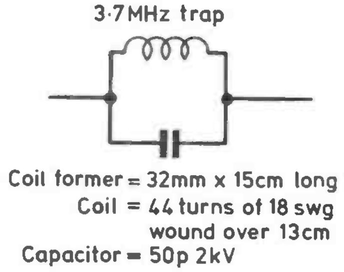

Fig. 6. 3.7MHz trap

References

(1) P.69 *A Guide to Amateur Radio* 17th Ed. Pat Hawker G3VA RSGB Pubns 1978