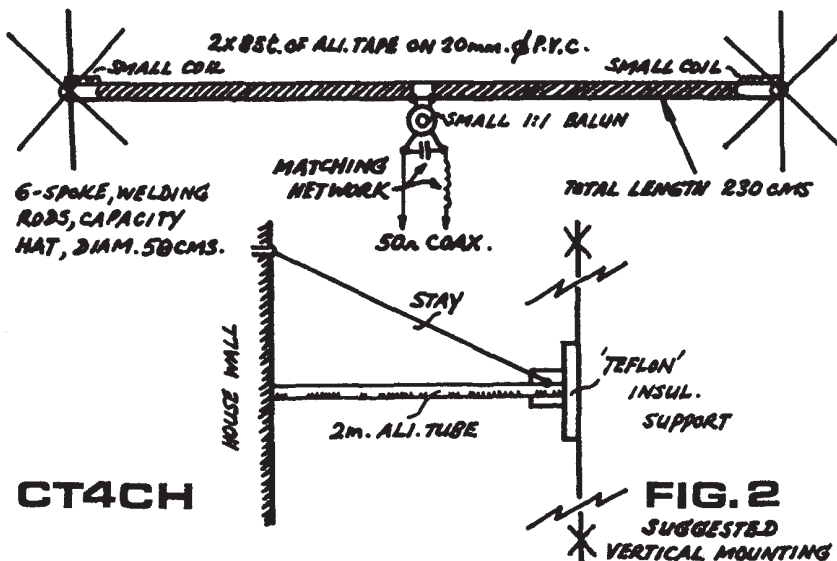


Some Helical Antenna Experiments

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FIG.1

15M HELICAL



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FIG.2

SUGGESTED
VERTICAL MOUNTING

I have recently developed a prototype helical antenna for 10 and 15 metres. The design incorporates helical windings made from 8mm wide aluminium tape, which provides low losses and light weight, and large capacity hats to increase the radiation resistance. The system is thus more efficient than shortened dipoles with large loading coils. Although very light, normal precautions should be taken to ensure that these antennas do not fall down and injure passers by. Although only tested at low power levels, the models described should be suitable for use at powers up to 100 watts output. The PVC is suspect at higher powers.

When used outdoors the radiation resistance will be between 20 and 30 ohms. If erected indoors the radiation resistance is not predictable owing to the dielectric loading provided by walls, house wiring, etc. Matching, particularly if the system is used indoors, is best achieved by means of an L network inserted between the feeder cable and a 1:1 balun, the balanced side of the latter being connected to the antenna. To allow fine tuning to resonate the antenna, small coils with tuning slugs are inserted between the ends of the antenna and the capacity hats. They are adjusted with the aid of a GDO.

As can be seen in the diagram, the 15m version provides a length reduction of 35% compared to a full size dipole, and the 10m version 40%

Connections to aluminium are always a problem; in the prototype pressure joints were used, each of them being carefully varnished to provide weatherproofing. Copper tape would obviously provide a better solution, although at an increase in both cost and weight. Which ever material is used the whole of the helix windings must be carefully covered with weatherproof tape before the antenna is erected.

The antennas have been developed from an amalgum of ideas published in various radio magazines and originality is not claimed. It has provided some remarkable results from a difficult second floor location in central Lisbon, however, if it is carefully constructed it should give results close to those expected with a full size dipole.

There has not been time to investigate further uses such as multi-band operation with open wire feeders, but it is hoped that other members will examine these aspects and report their results.