Antenna Workshop

Rugby based G0NZI (C. D. Peake) says that a small garden shouldn't be a limitation to working on the 1.8MHz band as he describes a simple 'Top-Band' antenna for restricted locations

Many recently built 'new houses' can hardly be classed as 'real estate'. Compare this to the situation a few years ago, when the average new house had a rear garden of perhaps 20-30m (65-100ft) long by some 3-8m (10-25ft) wide. I remember when I lived with my parents, that there was one house nearby in particular, that had a garden of over 40m (130ft) long. A garden that would have been excellent for erecting large wire antenna arrays.

However, the last two houses that I've bought, have had gardens the size of the proverbial postage stamp, averaging around 11x4m. The latest garden being only 10x4m. So, how on earth do you get around covering all the h.f. bands in the restricted space of such a small area?

The simple and easy answer to that was the excellent V9 h.f. vertical antenna, a visually unobtrusive antenna by the well known and respected British manufacturer Sandpiper Communications. The Sandpiper V9 antenna covers all bands from 1.8 to 28MHz. This relatively small ground mounted vertical stands around 5.9m tall.

I've had one of the V9 antennas for some time, it's great, I had no problems and a lot of success with it over the last six years. I have a friend who also owns a similar V9 antenna and who has recently moved house. Then, when the antenna was installed, the local neighbourhood seemed to become keenly proactive with regards to restrictive covenants. The upshot of this reaction was that my friend's antenna or indeed any other new structure was not to exceed 3m in height!

So, after an unexpected visit from 'Mr. Local Council Official', down came my friend's V9 antenna, to be replaced with the Maldol HVU-8 multi-band antenna that stands only around 2.5m high. And while this antenna covers almost all of the h.f. bands, it doesn't cover the 1.8MHz band at all.

As a result of the restrictions I set about to create, specifically for the 1.8MHz band, the antenna design described here. It's an antenna that's usable, in that it has a reasonable bandwidth, has low visual impact and it's easy to construct with minimal outlay.

Centre-Loaded Sloper

The antenna design that I've created is basically a 'centre-loaded sloper' antenna, fed via coaxial cable running down to the far end of the garden at fence level, (thus keeping the feed-point away from the house). The antenna is anchored between the top of the far fence or wall and the eaves of the house using the halyard system as shown in **Fig. 1**. It's fed against ground with a wire counterpoise – a 20m (66ft) length seems to work fine, though no doubt longer or more counterpoise elements could be added to (perhaps) improve things.

The actual construction of the design is very easy – the only minor difficulty may be winding the coil, which consists of 175 turns of 0.7mm (22s.w.g.) enamelled copper wire. These turns are close-wound centrally on a 300mm length of 41mm diameter waste-water pipe.

Winding the 175 turns on the plastic pipe results in an inductance of (around) 350μH. Once that is done, drill suitable holes at each end for the wire anchor points and secure the coil ends with nylon friction lock cable. The former and its coils should look as shown in **Fig. 2**.

The first test after building and installing was to find the resonant point at which the background noise peaks. Given that the end length of wire is deliberately over-length as the starting point, it'll probably need to be shortened to raise the resonant frequency and bring it in-band. The best way of doing this is not to actually cut the

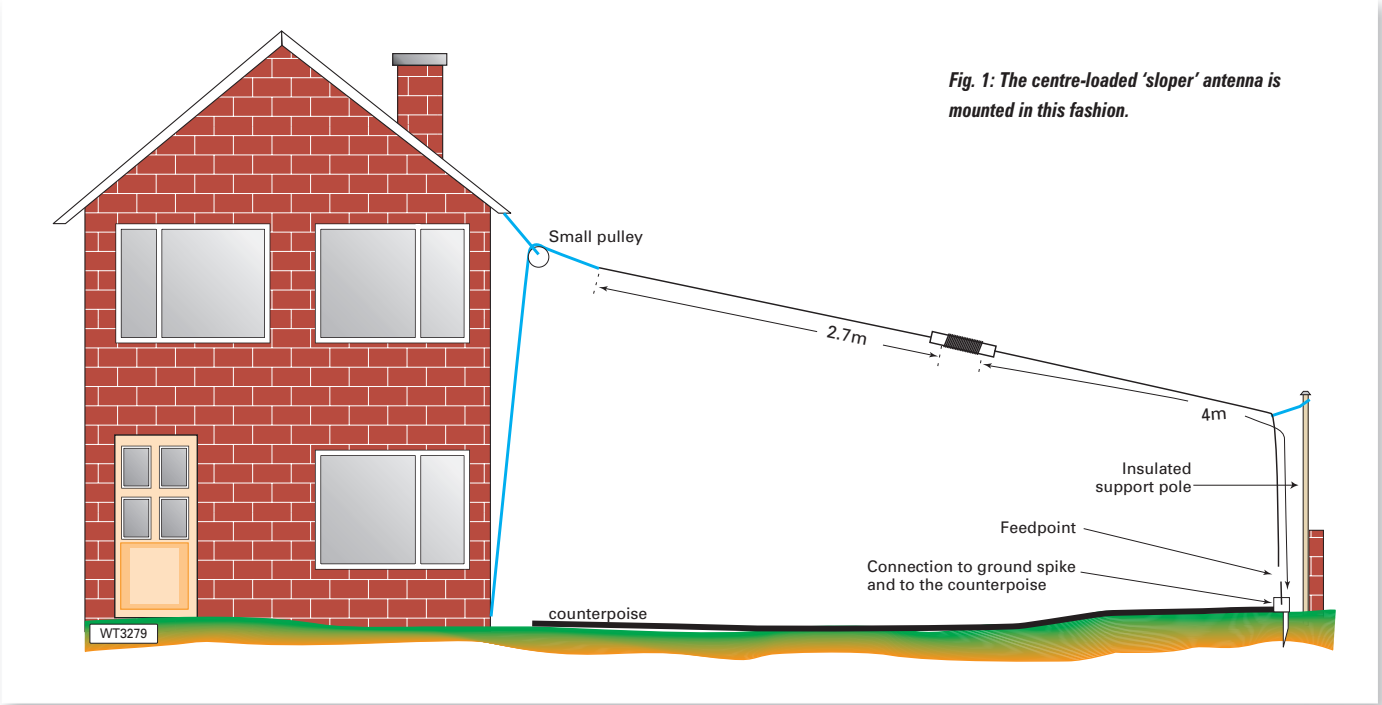
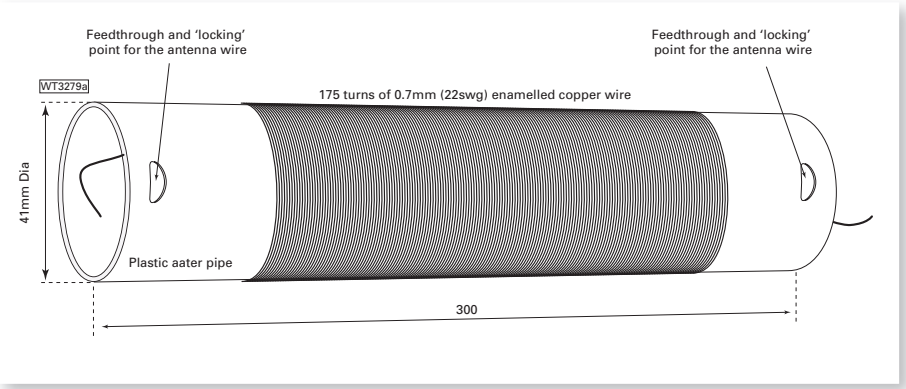


Fig. 1: The centre-loaded 'sloper' antenna is mounted in this fashion.

Fig. 2: The centre-loading coils is wound on plastic water pipe.



end of the wire but to pull it through the end insulator about 10-15mm at a time and wind it back on itself.

Once you have achieved the low s.w.r. at your chosen operating frequency it can be left in-situ until any further tuning or maintenance is needed. ●

Parts List

- 1 300mm long x 41mm diameter of waste pipe – from d.i.y. stores. £2+ for 2m length.
- 0.6-1.2m length of copper pipe for ground spike & counterpoise wire. Up to £2.
- 28.5m of 16/02 pvc covered wire or 5A lighting flex or equivalent: up to £2.
- 2 x End insulators – but you could make your own with any left over lengths of pvc pipe.
- 1 x SO239 UHF socket: up to £1.
- Solder tag for the ground side of SO239 and copper pipe earth spike.
- Total cost should be under £10 plus the cost of the 50Ω coaxial cable to feed it.