Slinky
long-wire top-band antenna

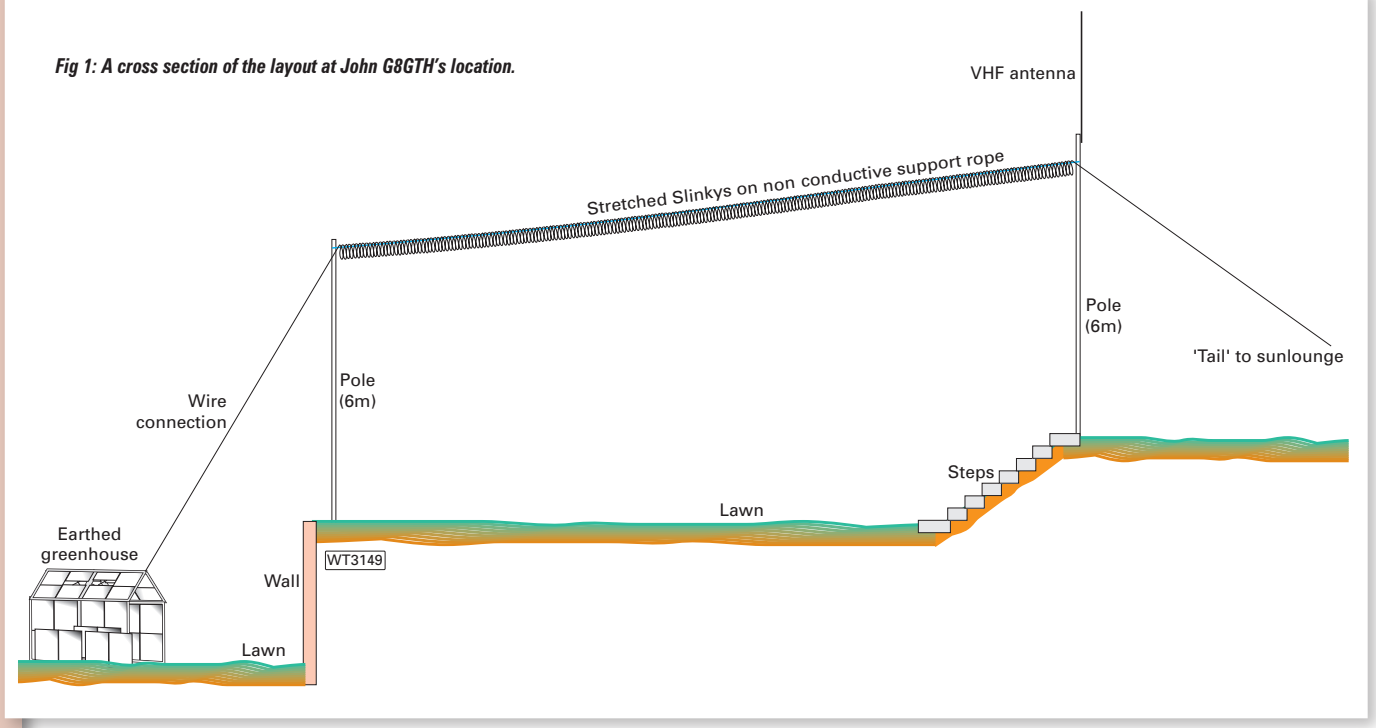
The Slinky antenna running down the garden at John's QTH.

My QTH is about 150m above sea level and being on the South Downs has only a few millimetres of soil above the bedrock chalk. This can prove a problem when constructing a good radio earth system. The real earth is probably many metres below the soil line, which can be helpful, in that I can get away with lower slung antennas than someone on a good conductive soil.

I have used multiple earth rods, plus an earth mat and radials on my vertical h.f. 3.5-28MHz antenna. This antenna lies lower down the garden and is fed from to the output of a linear amplifier. It's an antenna that has proved fine for the majority of DX working on the h.f. bands but the 1.8MHz band presents a problem all of its own.

Most Amateurs, myself included, don't have the space for an efficient antenna for 1.8MHz. I have a maximum horizontal run of about 27.5m from the house to the end of my main back lawn. There is a small lawn at the end of the main one that's about six metres long and 2.7m lower. The layout is shown in **Fig. 1** although not to scale.

Fig 1: A cross section of the layout at John G8GTH's location.



John Curzon G8GTH couples his Slinky antenna to the greenhouse at the bottom of his garden to get going on 'Top-Band'.

Fig. 2: One of the silver-soldered junctions between two Slinkys.

I have been using an auto-tuned (Icom AH4) long wire with a total length of about 50m, including a 'tail' of about 9m, running at 90° to it. This part runs sloping down to the lower lawn and is terminated about one and a half metres above ground, on a wooden post.

The long wire antenna has proved fairly successful, if a little noisy at times, on Top Band. The arrangement only worked with my Icom IC-746 located in my sun lounge, located on the upper floor of our chalet bungalow. In winter I use an alternative location, downstairs, with a Kenwood TS-2000. There's a connecting coaxial cable between the two shacks and a separate Carolina Windom antenna for 3.5-28MHz coming into this alternative shack.

Having read about antennas using Slinkys in *PW* previously and talked to **John Heys G3BDQ** (the Slinky expert) about them, I thought I would try using four of these toys soldered together to give an extra *artificial* length, in the space available (about 27.5m horizontally). I believe the Slinky adds about 70% of extra length, to a normal wire.

Unsuccessful

I was unsuccessful in obtaining the Slinky in local toy shops, so after a search on the Internet. I found that they were available through Amazon, priced at £2.80 each including VAT. I ordered five, just in case I needed an extra one. When buying, make sure you only buy the regular metal ones, as some are completely made of plastic material.

I joined four of the Slinkys together by binding the ends in two places; on opposite sides of the end 'ring' (they have a small clip to terminate the end loop) with a couple of inches of tinned thin copper wire and silver soldered the joints. One of the joints is shown in **Fig. 2**.

Silver soldering is a method of soldering used more in engineering, where steel is joined to brass or bronze. The temperature needed is higher and the 'solder' consists of a stick of silver-bronze rod using a powdered borax flux.

The solder rod is heated for a couple of seconds with a gas blow-torch and dipped in the flux very briefly; this gathers enough flux for the joint to be soldered. The work is then heated with the blow-torch until it glows just red and the solder rod applied. The solder should flow readily onto the joint.

I would imagine that ordinary electrical soft solder can be used but, as the Slinky is made of a composite steel mixture, I thought a hard solder joint would be more reliable. Also a solder tag was attached to each end of the antenna. One was for the feed to the shack, this is about 3m long, consisting of horizontal stranded covered wire. The solder tag at the 'far' end of the Slinky is for possible lengthening at a future date.

The antenna is supported by running a length of 6mm nylon rope through the centre of it and then fixing the Slinkys onto an insulator, along with the end of the nylon rope. I used a black cable tie at the feed end to attach the Slinkys to an insulator, plus a short length of nylon rope to the pole.

Fig. 3: The greenhouse on the lower lawn is used as a connection point for the 'far' end of the Slinky antenna.

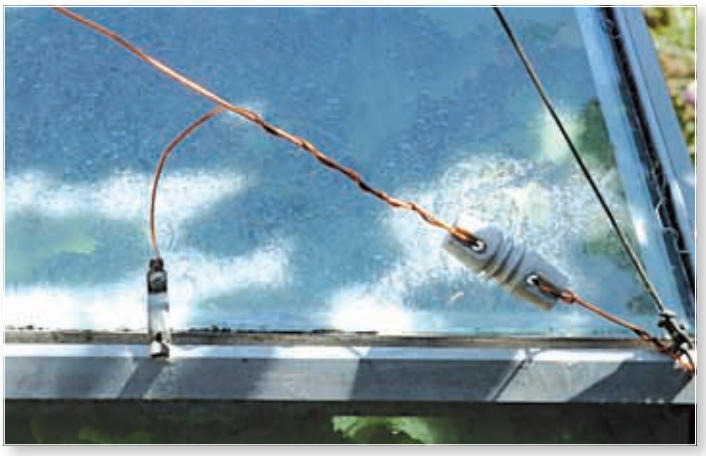


Fig. 4: Connecting the crocodile clip at the greenhouse end.

The not inconsiderable weight of the Slinkys is taken by the nylon rope. The far end of which then fixes to my six-metre aluminium pole by a draw cord of Kevlar material. This end can be lowered on a pulley, for working on the antenna.

The antenna is on average only six metres above the lawn, so it's relatively low in comparison with the advised effective height of 40m (quarter-wave). Using a manual antenna-tuning unit, that has a long wire output terminal and internal balun, I tuned up the antenna.

On test the antenna proved less successful than I had expected, with two S-points less gain than my original long wire and received reports down in comparison with it. My friend and our local top band net controller, John Heys G3BDQ, suggested earthing the end of the antenna, as he also has an earthed long wire.

Earthing of the far end on the antenna was achieved by running a 1.5mm enamelled wire, about 9m long, down at 45° (missing the pole), to my greenhouse on the lower lawn. The greenhouse is aluminium framed, **Fig. 3** and was already

Fig. 4: Looking up towards the sun lounge from the greenhouse end.

At the house end just above the sun lounge.

earthed into my radial earth system used for the Butternut vertical.

Rainwater Channel

By drilling a small hole in the aluminium rainwater channel of the greenhouse, I was able to make a suitable connection point. I then used an insulator with a short length of wire as a termination. The antenna wire was then looped back and fitted with a large crocodile clip, **Fig. 4**. So that the earth would not have to be permanent (more about that later). Finally, I gave the crocodile clip a spray of Waxoil (obtainable from Halfords) to help keep it rust-free.

This time when tested, I noticed a much quieter background noise level and reports from our net on Sunday morning suggested that although signal levels were down by about one S-point on both transmit and receive, compared to my normal long wire. But the speech quality had improved dramatically and my received signal to noise level had improved considerably. Neither John G3BDQ, nor myself can explain the improvement to the modulation quality - this was a surprising but welcome finding.

For my winter set-up, I shall leave the a.t.u. in the sun lounge, already tuned to our 1.990MHz net frequency and connect it to the coaxial cable going to the downstairs shack.

Of course this antenna is not restricted to 160m and will also work on both 3.5 and 7MHz while earthed at the far end, but tests have proved that the earth needs removing for working on the higher h.f. bands, hence the large clip at the greenhouse end.

So, there you have it my Slinky antenna now works on all h.f. bands, from Top-Band upwards. ●