Slinky loop aerial

Believe it or not, a wide range aerial made from a child's toy

PHOTO 1: The completed Slinky loop antenna, mounted on a tripod.

INTRODUCTION. If I told you I made an antenna 650mm in diameter that can transmit 80 to 17m with 100 watts and a SWR of less than 1.2:1, you would tell me that I am smoking my socks. Well, let me tell you the story.

We, that is my XYL and I, retired in South Africa where antennas are generally big, then relocated to my son's place in Lindfield, West Sussex. We have now moved in to a retirement flat in Haywards Heath, with no ground and no antennas allowed – and a noise level of S9+20. I was ready to take up tiddlywinks.

I asked around at the club and was given a loop design that jogged my memory. In the November 2003 *Practical Wireless* John Heys, G3BDQ, wrote about a Slinky Hula antenna he made with a Slinky, a hula hoop and a 120pF capacitor. So, using his design and a bit of my mechanical skills I have made my own version. It comprises 32 turns of an original Slinky, 2042 mm of 1/2" plastic water pipe, a plywood base, strong string and, most importantly, one 500pF variable capacitor.

Now, I just happened to have a Jennings vacuum capacitor, obtained from a boot sale in South Africa. This is the Rolls of capacitors, not for the faint hearted when buying a new one. I am also told that even if it has lost its vacuum you can still transmit up to 100W. If you are going to experiment with standard variable caps I would suggest a slow-motion drive. I found a 120pF did not tune down as low or as high as the 500pF cap and was very sensitive to the touch.

CONSTRUCTION. I started off with the pipe, marked the centre, 29mm either side of the centre and then at 58mm intervals 15 times either side of the centre. I then drilled 5mm holes right through the pipe (in a straight line).

The Slinky is available from several sources. Mine came from Maplin in Brighton. Count 32 rings of the Slinky and cut it with a strong pair of wire snips. Screw one side of the pipe to a suitable or plastic base, making sure it is in the same plane as the rest of the holes. Thread the Slinky over the pipe, bend the pipe round and then screw the other side of the pipe to the base.

Start with tying one full ring of the Slinky to the pipe and then one on each hole, ending with a full ring again. **Figure 1** and **Photo 2** show the basic arrangement.

I made up a bracket to hold the input socket and vacuum capacitor (see **Photo 3**). It doesn't need to be anything special, but there must be a good connection between the body of the input socket and the earthy side of the capacitor.

SETTING UP. It's important to find the right tapping point for best VSWR. To start with, connect the centre pin of the input socket about a quarter of the way round the loop. Tune the loop to resonance (listen on your receiver and adjust for maximum noise). Then transmit at low power, measuring the SWR. You will probably have to move the tapping point several times and maybe re-tune the capacitor because the settings can interact. However, once you've got a good match, you shouldn't have to change the tap for different bands.

I used my MFJ analyser and found I could get a 1.2:1 SWR anywhere between 80m and 17m.

IN USE. Initial tests on 5MHz by Ken, G3WYN got very good results. The loop was only a couple of S-points down on his full sized dipole, which surprised us.

As we have just moved into the flat I have not been able to experiment much further. But I am going to continue playing because it would be nice to be able to tune it remotely. I would like some one to design (cheaply!) a stop for each end of the vacuum capacitor drive if I use a stepper motor.

Have a go at building this antenna. I would like to know how you guys get on, maybe we all can benefit from your experiments too.

PHOTO 2: Detail of how the Slinky is mounted on the water pipe. The string is tied to the Slinky on the hidden side of the pipe.

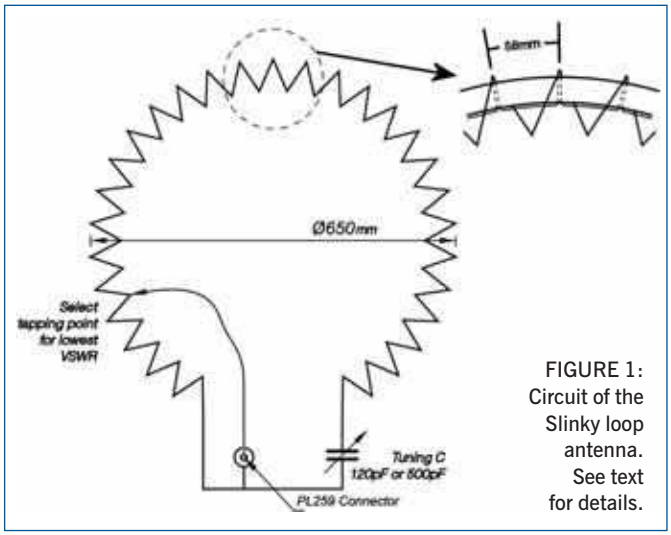

FIGURE 1: Circuit of the Slinky loop antenna. See text for details.

PHOTO 3: General view of the business end of the loop, showing the mounting block, capacitor/input socket bracket, wiring and my tapping point.