The Slinky Antenna

A lot of signal for not many $$$

by N6XN

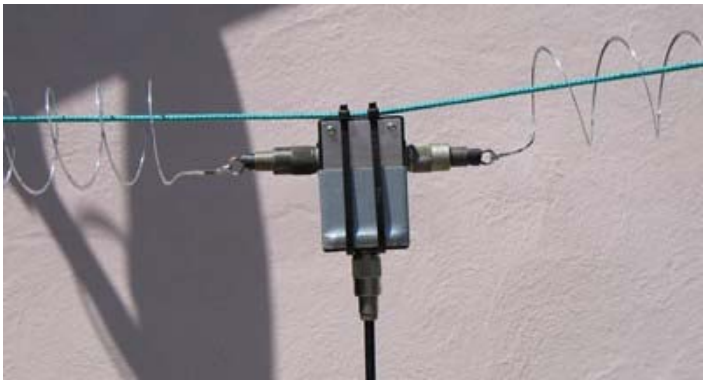
The Slinky is a toy made from a 90 turn spring. Way back in 1948, so the story goes, a bored machinist cranked one out on a lathe and was playing with it when someone suggested it might make a fun toy. I was one of the lucky kids to get one for a long past Christmas and had a ball with it. Sixty years later I'm still playing with them and still enjoy them every bit as much. (maybe more).

Since the early fifties Hams have been experimenting with these things; using them in various configurations as antennas. Here's what one anonymous author has to say about it:

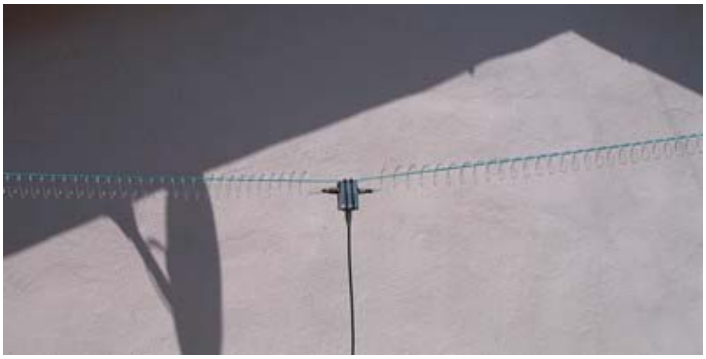
"It turns out that Slinky has some interesting electrical properties at radio frequencies. Since it is a helix made of conducting material, it will be self resonant at some frequency. In fact, a standard Slinky coil resonates as a quarter wave between 7 and 8 mHz when it is stretched to lengths between 5 and 15 feet. To tune the Slinky within that range one must only extend the coil to approximate size, then expand or contract it to reach the desired resonance. At a length close to 7-1/2 feet a standard Slinky is quarter-wave resonant on 40 meters. So a 40 meter dipole made from a pair of Slinky coils will fit in any apartment, balcony, or hotel room and can be put up in a matter of minutes. Dipoles resonant at frequencies above the 7-8 mHz range may be created by removing turns to shorten the helices or by shorting out turns. A twenty meter dipole for example, can be made by cutting a Slinky coil in half or simply by feeding it with a delta match in the center. For target frequencies below 40 meters, one adds turns from another Slinky coil or clips wire pig tails on the ends. For example, by adding one more coil to each side and stretching the whole to about 30 feet in length, you can make an 80 meter dipole that will fit in most attics and motel hallways."

Will it work for field-day? Without a doubt, but the question remains: How well will it work? We shall see. Some facts are certain: They are cheap and easy to make and a cinch to put up. For a backpack antenna, they don't come much smaller. It can be configured as a mono-bander as described above, or a multi-bander by stretching it out and playing it through a tuner. I plan to try it both ways at field-day.

The only downside I can see other than the fact it won't be full-sized is the fact that it is tin plated. Makes it a cinch to solder but will turn to rust if left outside for more than a couple of days. Here are the photos I took while putting it together. If it turns out to be even a modest performer you might want to make one for yourself...it doesn't get much easier than this:



Here's a close-up of the feed point. The antenna is not self supporting so it is strung on a "messenger line" which is just a length of nylon cord stretched tight between two supports.



A longer range view showing a nearly 40-meter configuration. In this shot the coils are stretched out about 8 feet in either direction and held in place with alligator clips attached to the messenger line. In the final version there will a lighter cord attached to the end of each coil so the length can be adjusted at will.

Another close up of the feed point. The black box contains the guts of a cheap balun (the non-ferrite type) that I took apart because I didn't like the original design. Instead of the cheesy plated eye-bolts that most come with I used SO-238 type UHF connectors. This permits a nice electrical contact that is easy to assemble and disassemble. A third UHF connector on the bottom makes a convenient place to hang the feedline. The duct tape and plastic tie wraps make it a tad stronger...the box is just a cheap RS project box made from ABS; practically melts in the sun!

Here's how to make the end connector. Just a loop of #10 copper wire soldered into the PL-259. A small scrap of coax jacket keeps the wire from contacting the shell of the connector. It probably would not matter if it did because the connectors are not grounded anywhere. The center of the feedline goes to the center of one SO-238 and the braid of the feedline goes to the center of the other SO-238. Being mounted on plastic, the body of the connector just "floats" electrically.

This is the dis-assembled antenna with a couple of baluns to give you an idea of what is in the plastic box. The balun on the left is the "gold standard" which has been around forever. It has a ferrite rod inside the coil but in spite of the quality of this unit, it uses those lousy plated eyebolts! Inside the tube, the wires connect to a solder lug which is under the eyebolt's nut. If you should happen to accidentally loosen the eyebolt, the connection will go bad and there is no way to retighten it. Use with caution. The balun to the right of the W2AU unit is like the one I used. No ferrite and its just a tri-filer winding on a short piece of schedule 40 pipe. About 25 cents worth of material but difficult to make. It fits inside the box nicely. If you don't want to use a balun it should work fairly well without one. Just use a standard dipole center connector and solder everything together just like a conventional dipole.

This photo shows the detail of connecting the Slinky to the loop of wire. Cut the end off the Slinky at the clip and bend a look in it with a pair of thin nosed pliers. Hook it into the loop of wire and crimp it down with the pliers. Apply lots of solder and you're all set.

I ran it up to 25 feet, stretched the coils out to nearly 15 feet in each direction and put it on the analyzer: 1.2:1 SWR with an impedance of right at 40 Ohms at 7025 kHz. The rig is gonna love it! I got the Slinkys in the photo layout at WalMart. $1.98 each.