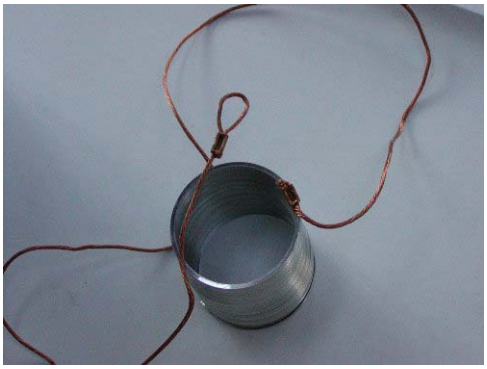
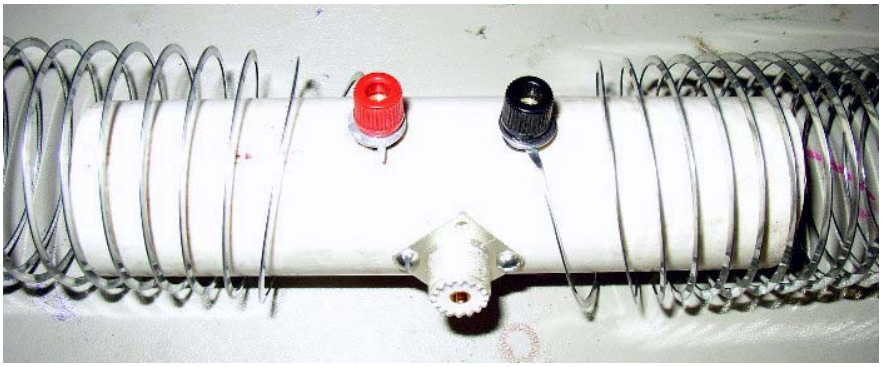
TECHNICAL TOPICS -- THE CLANDESTINE MULTI-BAND HF SLINKY ANTENNA



Wire extension



PVC center piece with binding post and SO-239 connector

Bill Hayden N1FRE built a slinky antenna for installation in his attic and showed us how he solved the problem of making connections to the slinky by mounting two binding posts on a piece of PVC pipe and wiring them to a SO-239 connector. Each Slinky contains 63 feet of flat steel wire and the effective overall length is a little over 130 feet. **Bill N1FRE** used a rope, strung through the Slinky and attached to the attic walls, to support the Slinky along with a separate rope attached to the PVC pipe to support the center. **Bill N1FRE** showed us how he crimped a short length of copper wire to each end of the Slinky to lengthen it and to make it easy to terminate the wire ends with a rope attached to the attic walls.

BILL HAYDEN'S N1FRE HANDOUT IS AS FOLLOWS

Slinking Around: Slinky is a toy made from a flexible 90-turn spring with a 2-3/4 inch diameter. Each Slinky coil contains 63 ft.- 8 inches of flat steel wire, and weighs approximately ½ pound. When a Slinky is compressed, it is only 2-1/4 inches long, but it can be stretched into a helix as long as 15 feet in length without deforming. An antenna made from a Slinky is light, simple to suspend and extend, and easy to put out of sight when not in use.

Slinky Antenna Basics: <> Since the 1950's, millions of people have had fun playing with the Slinky because of it's mechanical properties. But it turns out that the Slinky has some interesting electrical properties at radio frequencies too. 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 a wire pigtail on each end. For example, by adding one more coil to each side and stretching the whole array to about 30 feet in length, you can make an 80-meter dipole that will fit in most attics and motel hallways.

TECHNICAL TOPICS -- THE CLANDESTINE MULTI-BAND HF SLINKY ANTENNA Cont:

Performance:<> Is this a wonder antenna? No. But, it still works well. In a state-wide test on a 75 meter phone net, a 30 foot long, 80 meter Slinky dipole up at 20 ft. received signal reports on average 1-1/2 S units lower than a TNT Windom up at 35 feet. That's not bad for a 1/10 wavelength antenna! It would have done better if the antennas were equally high, but it would never out perform the full size dipole. Compared with a Hustler Mobile whip, it's performance and bandwidth were outstanding. So, considering that you can even install a Slinky antenna that will work on 80 meters inside a motel room, slinking around with one promises some good moments.

TIPS FOR EXPERIMENTERS:

Here are a few things to keep in mind when working with Slinky coils.

1. The simplest way to obtain multi-band results is with a **pair of Slinky coils.** Stretch them as far as space permits, then attach a feed line made of coax or twin-lead. Here you have a compact version of the good old "center fed Zepp". Feed it through an antenna tuner and this simple antenna will work on all bands, 7 MHz and above and in a pinch it will even permit QSOs on the 80-meter band.

2. Experiment with feed line connections that best suit your needs. Binding posts bolted through a short length of PVC pipe, crimp and solder connections and wire nuts are but a few ideas.

3. **Note: <>** Slinky coils will corrode if left outdoors for more than a few weeks. Corrosion will take place on the surface where the RF energy wants to travel. This means that the Slinky is really best suited to indoor or portable deployment. If you wish to put your Slinky antenna outside on a more or less permanent basis, you should solder all connections well, then paint the whole antenna with a spray enamel.

4. Slinky coils are not self-supporting so you will need to use a strong nylon line or lengths of PVC pipe run through the center of the Slinky array to support the weight of the coils.

5. For a given Slinky antenna, performance seems best at the frequency of natural resonance and on the next harmonic because the coils act increasingly like an RF choke on the higher harmonics.

Have Fun Slinking Around: <>

Kids don't know half the fun of a Slinky. <> Could they imagine talking into one and having someone from the other side of the world answer them on 15 meters? Or think of checking into MARS or RACES NETs with a Slinky strung on the bedroom wall, or in the attic? Only in Amateur Radio can you have as much fun as this with a Slinky.

Notes: 2.71" diameter x pi = 8.5" circumference x 90 turns = 63 feet 8 inches of flat steel wire per Slinky coil

73 and you have a grrreat Slinky Day! – From: Bill Hayden N1FRE