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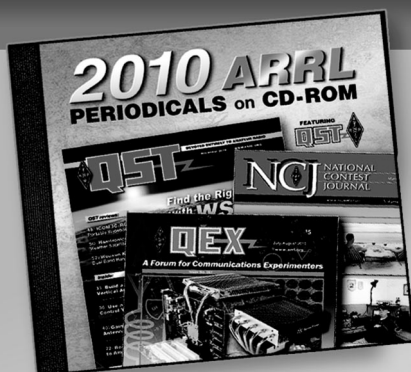
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Author: Arthur Peterson, W7CZB

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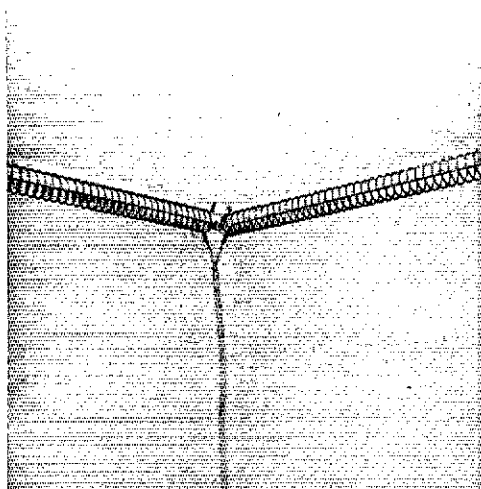
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• *Beginner and Novice*

Apartment Dwellers' Slinky Jr. ant.

BY ARTHUR J. PETERSON,* W7CZB

We receive many, many requests from Novices, and old timers for that matter, for small-size, apartment-dweller antennas. As W7CZB points out, it is difficult to find a limited-space antenna that does a reasonable job. We think he has found the right system — at least it works well for him and it might for you.

THE SEARCH for an ultra-compact, high-frequency antenna which tunes more easily and radiates more efficiently than the current crop goes on and on. Amateurs living in dense urban environments, especially apartments and condominiums, where conventional antennas simply cannot be erected, keep searching for the ideal miniature antenna.

Ingenious amateurs have developed many compact antennas over the years and have published construction details for the benefit of their colleagues. Each antenna this writer has tested performed with a degree of satisfaction, but the ultimate — or even the near ultimate — seems to be as elusive as ever.

A few compact antennas and some of their many variations which this writer has tested in mobile homes and apartment dwellings are mobile whips, windowsill semiverticals, short (end and center-fed) random-length wires, and grounded systems. Each antenna had one or more adverse characteristics. The whips had a narrow range at the lower frequencies; the windowsill antennas were aesthetically unacceptable; the random lengths presented many voltage loops to the transmitter; and the grounded systems did not perform well unless a short connection to a good earth ground was available.

Probably the most general adverse characteristic was the one of difficulty in tuning the antennas to a load which would be acceptable to the transmitter. This meant changing bands was a major and time-consuming task, and often tricky.

Utilizing an Ultimate Transmatch described in the July, 1970 *QST* and the 1972 Handbook greatly improved the operating convenience and operating efficiency of the antennas tested because it provided a rapid return to exact predetermined

band settings. This feature always assured a proper load for the transmitter.

The Adjustable Miniature Dipole

The appearance of the "Slinky Jr." coil spring in toy shops offers the basis for an inexpensive, compact, resonant, and easily adjustable indoor antenna. These 1-3/4-inch diameter (copper plated) coils are available in 72-turn lengths for about fifty cents. Double lengths are available from the manufacturer. (See the list of Fig. 1.) A multiband center-fed dipole can be made up with six single-length coils. Three coils, soldered together and strung out on 3/4-inch diameter, ten-foot long wooden dowel, forms one of the two antenna segments. These two lumped-inductance segments will resonate initially near, if not in, the 80-meter band. Fine tuning or changing bands is simply a matter of adding short stubs for 80 meters and shorting turns from the ends of these coils for the higher frequency bands. See Fig. 1. A Transmatch is utilized by this writer as a convenient, although not necessary, accessory for tuning the system precisely *after approximate antenna resonance is attained* by shorting coil turns.

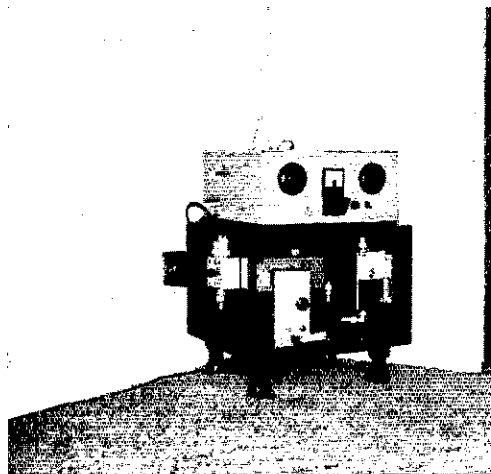
A typical installation is shown in the photos. The system is fitted into a 10 × 11-foot den. Probably the most important mechanical feature is that the antenna segments can be easily installed and removed without marring or damaging room structure. They can be reached from a standing position for tuning adjustments or with the use of a foot stool for short persons. If the wooden dowels and the coil springs are decoratively painted, the installation should be as acceptable aesthetically as it is functionally.

Warning

Dangerously high rf voltages can appear at the outer ends of this antenna. If the operating gear is

* 3230 80th Ave, SE, Apt. 6, Mercer Island, WA 98040.

The accessory console used by the author adds to the pleasure of tuning and operating this antenna system. All essential accessories are conveniently packaged in one module which can be moved about without having to cope with a wearisome disassembly and reassembly procedure normally followed. The legs are removable for table top placement if so desired. Ample space is provided for storing other test equipment.



near one of these extremities, or if children frequent the shack, the free-hanging tuning jumpers connected to the antenna should be secured beyond normal reach as a safety precaution.

Tuning

Resonating this antenna to an approximate frequency is a simple matter with a grid-dip meter. Short the feed point of the antenna together so that the coils are one continuous circuit. Couple the grid-dip meter to the center of the antenna and then short out the antenna ends until you get a grid-dip indication at the desired frequency, indicating resonance.

In the installation described here, the feed line is 300-ohm TV twin line. This works well with the Transmatch. However, 50-ohm coax line could be used. If coax is used, insert an SWR indicator in the line and then adjust the antenna electrical length for the lowest indicated SWR.

Performance

This antenna installation is located on the third (top) floor of a wooden frame apartment building and away from major wire concentrations and

metal ducting insofar as possible. Its primary purpose is to provide reliable 240-mile weekly 80-meter phone contacts between two low-powered transceivers — which it does. Operation on the 40- and 20-meter bands is also satisfactory.

Operating as a resonant doublet, the antenna is not difficult to prune for an SWR of unity on the 40-meter band. On the 80/20-meter bands SWR values are higher, ranging from approximately 2:1 to 4:1.

When the overall installation is tuned to half-wave resonance as a doublet, it will also perform well as a grounded "T" with the feeders tied together. The vertical lead-in wire will then become the radiator where maximum current is concentrated and the coil segments will act as a capacitance loaded top hat. It must be remembered, however, that a short connection to a good earth ground is essential for the success of this mode of operation.

For a final and important thought — the successful performance of any compact antenna using low power depends primarily upon the skill of the operator in choosing best times for wave propagation and least QRM. QST

① Two 3/4-inch by 10-foot wooden dowels. Available at most lumber yards for approximately \$1.00 each.

② Three Slinky Jr. coils soldered together, six required to make the complete dipole. Manufactured by James Industries, Hollidaysburg, PA 16648. Cost, approximately 50 cents each at toy stores.

③ Six 1-inch vinyl covered cup hangers (hooks), three per antenna segment.

④ Four alligator clips to facilitate antenna installation and removal.

⑤ 300-ohm TV twin line.

⑥ Two 33-inch tuning stubs for 80 meters, also used for jumpers on the 20-meter band.

⑦ Two 115-inch tuning jumpers for the 40-meter band. This also may be an 82-inch extension to the 80/20-meter band stubs and jumpers.

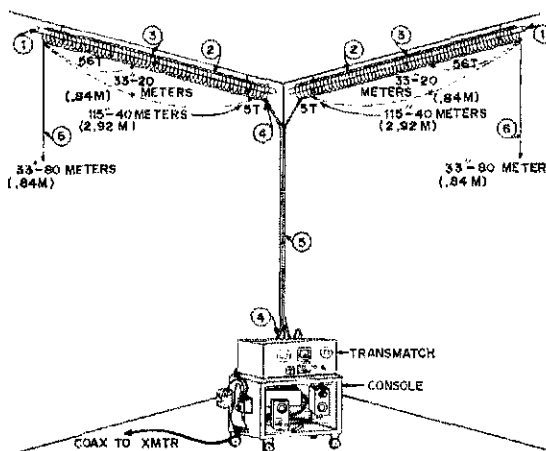


Fig. 1 — This drawing shows the installation of the Slinky Jr. Antenna.