



Build the Hidden Flex-Tenna for Wide-Frequency-Coverage Receivers

By Bob Grove W8JHD

Do you live in a home or apartment with restrictions against outdoor antennas? Do you have a shortwave receiver, scanner, or wide-frequency-coverage receiver with only one antenna connector? The Grove Hidden Flex-Tenna may be the answer. It takes only minutes to construct and requires less than 30 feet of wire; a connector is optional – you can solder the feedpoint directly to your coax feedline if you prefer.

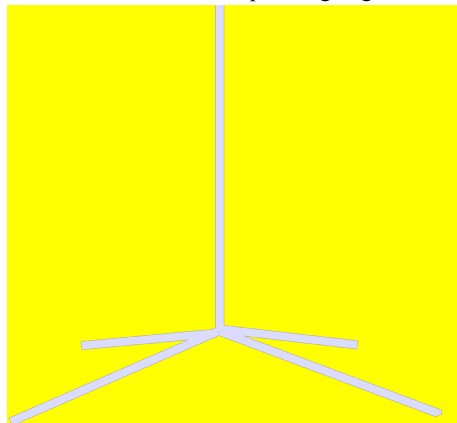
The frequency range for this antenna is quite remarkable; its cluster of three elements provides excellent signal response from the medium-wave AM broadcast band clear through 1000 MHz or more. While untested at 2400 MHz Wi-Fi frequencies, I suspect it will pick up signals there as well.

In a previous issue (March 2006), we showed how you can build the new Grove Flex-Tenna; this is a variant on that antenna with consideration of indoor suspension requirements. Ideally, the Hidden Flex-Tenna should be mounted in an attic or crawl space, along the apex of the roof line to keep it high and away from electrical lines, and up above metalized-Mylar insulation.

It can be fed to the radio by any gauge of coaxial cable. Keep in mind, however, that small-diameter coax like RG-174/U is very lossy in long lengths and at VHF/UHF frequencies. A much better choice would be RG-59/U (indoor TV coax) or RG-6/U (outdoor TV coax).

The Theory

Several elements operating together on



A ground-plane vertical, simply one vertical tubular element with four drooping tubular elements at its base.

different frequencies is known simply as a cluster; in this case, we have a horizontal wire for under-30 MHz reception, and two vertical elements of different lengths for continuous, 30-1000 MHz reception. No ground wire or counterpoise connection is necessary.

Sharp-eyed readers will note the similarities between these wire lengths and those of the previously-mentioned Flex-Tenna. Purists may wish to add a second horizontal wire 19 feet in length alongside the 24-foot wire for a minor (but barely perceptible) improvement in shortwave signals, as is done in the Flex-Tenna.

Construction

Using any convenient wire (thick or thin, insulated or uninsulated), cut it into three lengths: 24 feet (any length from 20-40 feet is fine), 48 inches, and 18 inches. Twist together one common, bared end of each of the three wires and solder them, leaving the three far ends unconnected. You may wish to solder the three joined wires to the center pin of an RF connector like a TV-style F connector or UHF (SO-239) so that the mating coax cable can be easily connected and disconnected.

Note that there is no connection at the antenna feedpoint to the coax shield; only the center conductor is attached to the antenna. The coax shield is, however, attached at the receiver end in the normal manner by the antenna connector.

Run the 24-foot wire along the underside of the roof, the higher toward the apex the better. You can pass it through spaces in the roof joists, or even staple it or tack it at intervals to the wood.

At the feedpoint, let the two shorter wire elements dangle down, as straight as practical. Run the coax cable at least 2 feet away from the vertical wires before turning it down toward the radio room.

That's it! For listeners who don't have the time or tools to build the Hidden Flex-Tenna, it is available ready-made from Grove Enterprises (ANT49 \$19.95; call 800-438-8155 or email order@grove-ent.com).



A 25-foot horizontal wire with two short wires (18" and 48") dangling from the left end. The center wire of a coax cable is soldered at that mutual point.

FlexTenna Follow-up

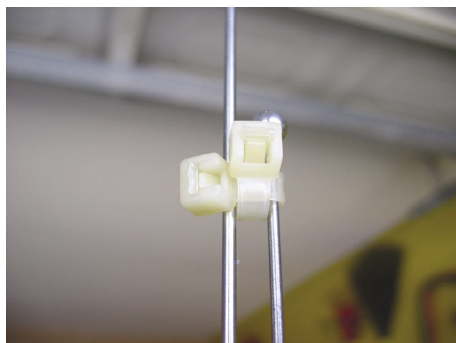
Dear Bob,

"I read your (March 2006) article with much enthusiasm as I have been wondering what to use for my Uniden 780XLT in my car. I used your design in the 'Build the FlexTenna...' article and came up with this.

"Using the whip from my mag mount 2-meter 5/8 Larsen, and the whip from my mag mount 2-meter 1/4 wave, I fashioned a mobile FlexTenna after your design (not so flex). See attached photos.

"I simply secured the 19-inch whip next to the ~49-inch whip with six non-conductive cable tie-wraps. The distance between the two rods is 3/16-inch, essentially, the width of the 'vertical' tie-wrap. The base of the short rod makes electrical contact with the base (i.e., the





metal collar containing the retaining set screw) of the larger rod merely by compression made with a few wraps of fusing electrical tape (tape stretches and fuses to itself when wrapped over) stretched very tightly around the base of the larger whip collar."

Questions:

- 1) [off-topic, but I want to know]: Where/how can I find a ball for the longer whip. Do I need it?
- 2) The lengths of the whips are 48-1/4" (including the metal receptacle for the longer whip) and 19" (the shorter one). Your design calls for 48" and 18". Will my lengths make a significant difference from yours? It will be easy for me to shorten the heights if need be. And does the separation between the rods need to be smaller like in the electrical zip cord version? If yes, I can use a smaller width tie-wrap for the vertical wraps.
- 3) I listen to all bands: from aircraft (120 - 135 MHz) to trunked police (800 - 900 MHz). I seem to hear more activity, a few more in the

UHF milair band. I do not have any equipment to check things out quantitatively. Do you think that I need to adjust the separation and the heights?"

Thank you, Peter Leong, KE5YE

The description sounds like you've done everything right. I can't think of a thing to tell you to make it better since you have electri-

cally duplicated everything from the original FlexTenna.

Incidentally, I've never tried transmitting on any VHF/UHF frequency with the antenna; all measurements were made referencing received signal strengths as shown on a spectrum analyzer. If you do any two-way comparison, please let me know! Good luck and....

73, Bob

94-Cent Hand-Held Radio Pouch!

By Bob Grove

While perusing the camera department at Wal-Mart recently, I came across a bargain: a canvas camera pouch with belt strap and Velcro lid for \$.94! Happily, it was a perfect fit for my Radio Shack PRO-83 and Uniden BR330T. Even my trusty, old Uniden BC3000XLT slipped into it as well, although it was pretty darn tall!

The newer, compact scanners and hand-held transceivers nestle into these camera cases neatly, but the older, taller radios stick out the top. This is an advantage, however, for Velcro-sticking it to a dash where you can see the display.

Whether you plan to wear the pouch on your belt or stick it to your automobile dash, bring your hand-held radio next time you're going to a super store, and check out the low-cost camera cases. The one shown for \$.94 at Wal-Mart is branded *Targus*, and measures 3-1/2"W x 4-1/2"H x 1-3/4"D.



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