



## KV5R's OCF 2-Meter Sleeve Dipole Antenna

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### A Popular Project

Lots of people are building this antenna! One fellow even improved upon it by making the elements out of aluminum - inside a 3/4" PVC pipe -- see QST August 06.

Antennas just cost way too much! You can build this one for well under \$10. It's a:

- cheap,
- easy,
- stealthy,
- good performing,
- no ground plane,
- portable/mobile/marine/base,
- fun project antenna!

This is an off-center-fed sleeve dipole, made of 1/2-inch CPVC and aluminum foil tape. The elements are fed 3-1/4 inches below center, with the coax inside. Off-center feed is required because of the interaction of the lower element with the coax inside. Note: if you make it center-fed, the SWR will be about 2.5:1 across the band. Lowering the feedpoint by 3-1/4 inches lowers the SWR to under 1.5:1. It is very broadband, being useable from about 142 to 152, and all of the 440 band as a 3/2 dipole. Also works quite well as a VHF/UHF public service band scanner antenna.

Note: I do not claim origination of this general design. OFC sleeve dipoles have long been used as marine HF antennas, and more recently, are widely used in small UHF wireless consumer devices.



This dipole was constructed as follows.

1. Cut 7 feet of 1/2-inch CPVC.
2. Drill 7/32nds holes at 22-1/4 and 58 inches from the "top" of the CPVC pipe.
3. Cut upper element tape (2" wide aluminum duct tape) at 22-1/8th inches. Make two.
4. Cut lower element tape at 15-5/8ths inches. Make two.
5. Apply two overlapped layers of the tape to the upper and lower parts of the CPVC, leaving a 1/4 inch gap at the hole which is 22-1/4 from the top. The overall length of the two elements should be 38 inches.
6. Take 6-12 feet (or as needed) of RG-58 and apply the appropriate connector to one end.
7. Strip about an inch of the other end; fold the shield back. Bend a curl in the end of the center conductor.
8. Push the coax into the lower hole with the curl "up" and guide it into the pipe, pushing and twisting as needed, until it pops out of the upper hole, between the elements.
9. Strip out about 5/8ths inch of the center conductor. Apply a little Penetrox to both center and shield.
10. Pull the coax back until just the conductors exit the hole.
11. Lay the greased conductors on the elements and tape them down with a couple little strips of aluminum tape.
12. Tape the whole feed with several layers of tightly-stretched electrical tape (Scotch 33+). Secure the end of the tape with small cable ties.
13. Seal the ends to keep out water and bugs.

To make it look cool, spray paint it glossy white, dry, then spray every other six inches with flourescent orange (portable or bicycle); or olive drab ("covert" ops). I painted mine white because that's what I had handy. Don't use conductive (metallic) paint!

The same idea (CPVC and foil tape) may be employed to build small yagi antennas also.

Ignore the ruler -- it should read 22-1/4 (from the top), not 19 (photos taken on first try).



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The coax conductors are connected to the tape elements by being (1) greased, (2) sandwiched between aluminum tape, and (3) compressed with several layers of tightly-stretched electrical tape. Again, ignore the ruler -- it should read 22-1/4, not 19. Make sure to use conductive grease (Penetrox) and lots of pressure at the feedpoint, to ensure that it can handle moderate current.



The antenna can be stuck down the back of the shirt, carried, or easily mounted on bicycles, etc. With a little more weatherproofing, it will make a fine dual-band base station antenna of moderate gain (2.2 dbi) and stealthy appearance (paint it the same color as your roof then clamp it to a vent pipe).

### How Does it Work?

Fabulously! The 1/2-wave dipole, even quite near the body (which you can use as a reflector if needed), works so much better than the H-T's duck - there's just no comparison. With the six-watt H-T on a full 12.7 volt, 7AH lead-acid battery, and the dipole, it performs as well as a mobile of the same power. I can walk around with this rig and hit several repeaters 20-30 miles away with ease with 4 watts - and even get full quieting into a repeater 9 miles away on 1/2 watt!

### August 2006 Update

Since the QST article, many people have written emails to me regarding this design. Several are building variations of it, and we are compiling more data, which will be included in this article.

### Notes:

Many people asked me for a formula for the offset. I don't have one. The antenna described herein has the feed point about 8.5% below center. This will vary with the coax and PVC used.

How to determine the offset: Build one with the foil tape elements a few inches too short. Wrap aluminum foil around the ends, with rubber bands. Move the foil ends up and down till the SWR comes into line. Measure. Peel off the tapes and apply new ones, cut to the proper length. Test it a final time and if ok, seal the feed. That's how I did it.

Don't use gray PVC. It just won't work - something about the plastic.

--73, Harold Melton, KV5R

Please see my new articles on [KV5R.COM](http://KV5R.COM), too!



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