Feedline Verticals for 2m & 6m

By Rolf Brevig, LA1IC *

DURING DECADES of portable operation on the 2m and 6m bands I have met amateurs who needed antennas that were efficient, simple to construct and also easy to hang up almost anywhere. The feedline vertical antennas described here provide an excellent match to a transceiver, without a separate antenna tuner. They can be easily coiled-up and stored in your luggage or even stuck in your pocket, as they are made from only one piece of flexible coax cable. The basic design is extendable to any frequency segment between 50 and 150MHz.

The point of departure is the coaxial sleeve antenna (**Fig 1**), which was popular until the advent of modern SWR analysers. A true resonance will always be found, but I have never achieved a better SWR than 2:1 in such antennas, probably due to stray capacitance. The lesson learned, however, was that the RF current had no trouble in travelling up the inside of the coax and then making a 180° turn to travel back down the outer sleeve.

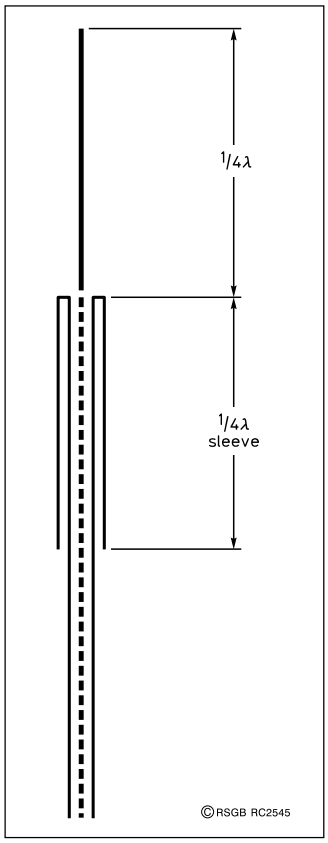


Fig 1: The coaxial sleeve antenna. The best SWR that could be obtained was 2:1.

Because of this, perhaps we don't need the sleeve. Why not just use the braid of the coax itself? If we do this, however, how do we let the RF 'know' when it should stop flowing and reflect back towards the centre of the dipole, as it did when it came to end of the braid in the coaxial sleeve antenna?

After trying different wideband devices, I found that a coaxial cable choke resonating within the band segment in question was the best solution to meet my requirement. Very low SWR, broad- bandedness, and the possibility of working out reliable dimensions from the formulas in **Fig 2**.

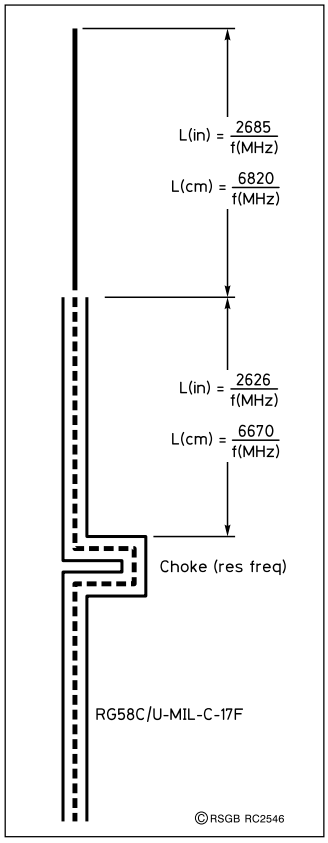
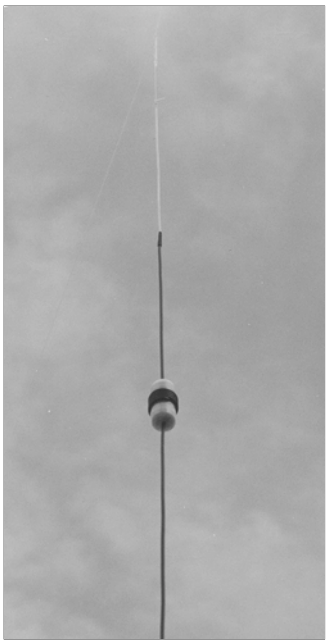


Fig 2: The feedline vertical. The best SWR that could be obtained was 1.1:1.

2M ANTENNA

IN THE PHOTOS you can see the 144MHz version of this antenna. It is made from a 387cm (152¼in) long piece of RG58CU coaxial cable, of which a quarter wavelength (use the formula) of sheath and braid is stripped off, this forming the upper part of the dipole. Next, measure the lower part of the antenna (use the formula) and mark the starting-point of the choke. For the choke, wind 4.6 turns of the coaxial cable onto a piece of 32mm (1¼in) diameter PVC tube. The caps on each end are not essential, but they are useful to centre the cable and lock the turns.

A ring terminal or tag needs to be soldered to the tip of the dipole, bearing in mind that this will lower the resonant frequency a bit. Trimming, if necessary, should be done at the tip, outdoors, well away from objects that might affect the resonance. Don't cut more than 6mm (¼in) at a time. The SWR should be less than 1.3:1 and the impedance very close to 50Ω across the entire band. Observant readers will see that I have used exactly 5 electrical halfwaves (340cm) of feeder. It is a good idea to make any additional feeder a multiple of 68cm (26½in).



The feedline vertical can be suspended by nylon line from a tree limb or any other convenient support. It should dramatically extend your maximum communication range when operating portable, in comparison with a whip or 'rubber duck' antenna.

Rolled-up and ready to go, the 2m version of the feedline vertical.

6M ANTENNA

FOR A 50MHz vertical dipole you start with a 728cm (286½in) length of RG58CU. Using the formulae, follow the same constructional procedure as previously. In this instance the choke consists of 11.8 turns on 50mm (2in) diameter PVC tube.

Although not critical, you can centre the antenna to your favourite 6m frequency by cutting the tip little by little, and still enjoy a 1.3:1 SWR across the band. Adding feeder to this antenna should be in multiples of 198cm (78in). ♦

What Do You Know?

Last month's answers:
1d, 2b, 3c, 4a, 5b, 6b, 7c, 8a, 9a, 10c, 11a, 12c.

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