

Vertical Antennas for Field Day

Cushcraft R5 for 20/15/10 meters

33 foot fiberglass-whip with impedance matching box for 80/40 meters

The Cushcraft R5 vertical with self contained counterpoise covers 20, 17, 15, 12, and 10 meters, and is a good antenna for 20/15/10 meters for Field Day. It is heavy duty structurally and supports the legal power limit. It is no longer in production, but similar antennas are still available. The R5 is easily and rapidly installed on a metal post. For storage and transport, it can be disassembled in the middle resulting in 2 sections about 10 feet long each. Also, the 4 bottom counterpoise wires and the cross-hat are easily removed and reinstalled.

I discovered that the cross-hat was lost for my R5. Unfortunately the R5 is no longer in production, but similar antennas are still produced by Cushcraft such as the R8. I was able to use the 40 inch cross-hat components for the R8 to restore my R5.

SWR measurements on the R5 were very close to the published results in the manual. Here are key measured results for the 20/15/10 meters CW bands:

Freq	SWR
14.0	1.61
14.1	1.14
14.2	1.38
21.0	1.4
21.1	1.18
21.2	1.14
28.0	1.10
28.5	1.14



Cushcraft R5 20/17/15/12/10 Meters Vertical Antenna

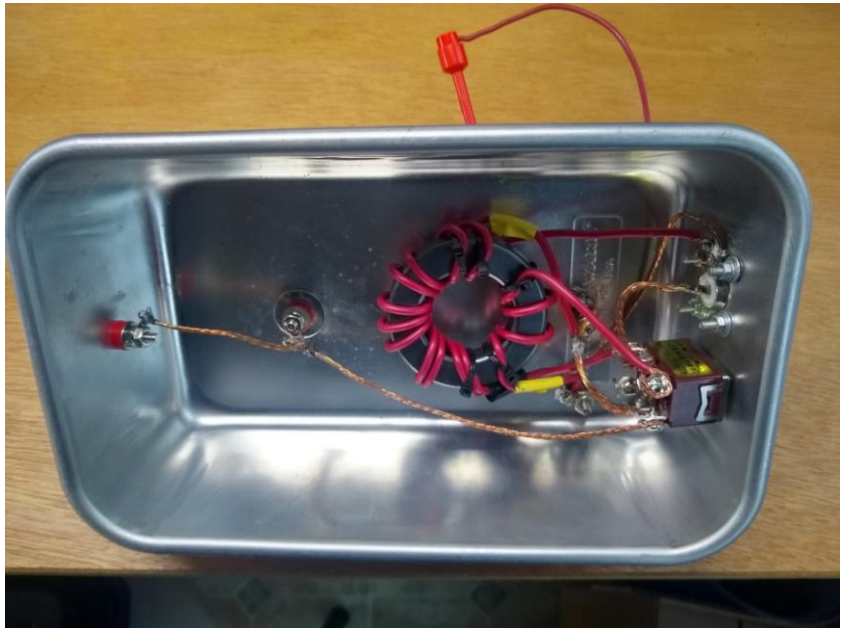
For 80 and 40 meters, a 33 foot fiberglass whip supports a full size 1/4 –wave vertical on 40 meters. One 33 foot wire is taped to the fiberglass whip, and 8x 33 foot wires are evenly spaced around the 33 foot whip laid on the ground for radials. This is driven directly on 40 meters. For 80 meters, a loading coil of about 24 microHenries is needed to achieve resonance. A 2 inch diameter coil with 36 turns or 4.5 inches at 8 TPI provides this requirement.





The Loading Coil and Impedance Match Box for 80 Meters

A toggle switch changes operation from 40 to 80 meters.



The Impedance Match Transformer with a 2.4" Toroid and 8 to 5 Turns

SWR measurements on the 80/40 vertical for the CW bands:

Freq	SWR
3.5	2.0
3.52	1.65
3.54	1.13
3.56	1.05
3.58	1.33
3.60	1.75
7.00	1.09
7.10	1.21
7.20	1.55

For Field Day operation, the intent is to erect the 2 verticals with about 100 feet of separation, and then locate an operating trailer offset from the center of the antennas with about 80 feet to the base of each antenna. This allows the use of 100 foot coaxes to connect the verticals to the CW operating trailer, and the CW operating trailer will not be directly in the line between the antenna clusters for phone, digital and CW operations. The 20/15/10 meters vertical will be located closer to the phone inverted vees with the 80/40 meters located further away. Light guy ropes will be used to set and hold the verticals securely in vertical positions to help achieve good polarization isolation with the multiband inverted vee for phone operations and the multiband trap dipole for digital operations.

Setup and storage

R5 20/15/10 meters Cushcraft vertical

- While laying on the ground, attach bottom and top section and tighten clamp
- Install the cross-hat
- Attach 3 guy ropes at the cross-hat
- Mount of a 5 foot steel post driven about 1 foot into the ground
- Install 4 counterpoise elements near the base
- To remove for storage – perform this in reverse – tape 4 counterpoise elements to the main bottom section & tape cross-hat elements to the main top section

80/40 meters vertical

- Drive a 3 foot steel post into ground at the base location
- Extend 33' fiberglass pole and tighten each section
- Uncoil 9x 33' wires (1 driven and 8 radials)
- Tape driven wire to pole in 4 or 5 places with about 1 foot of excess at base

- Mount the fiberglass mast
- Spread out the 8 radials
- Install the base impedance match box & tune the radial placement