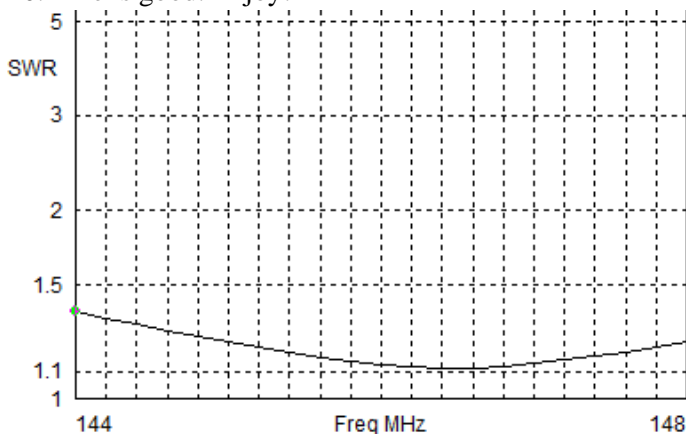


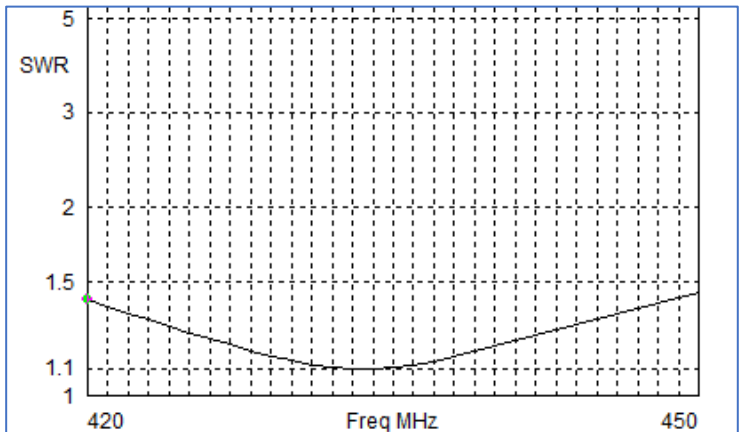
## Ham 67 – Short Counterpoise, VHF

Dr. Marc & Rosemary © 221012

1. Creating and making antennas is one of the things that maker-hams often practice. Computers and modelling let us try myriad things before we build. The software used is EzNEC by Roy Lewallan, W7EL, who has released it to the public.
2. Conventional vertical antennas consist of a quarter-wave (0.25) radiator (VHF = 20.22"). Whether used as a counterpoise or ground plane, determines how many radials stick out. Their length is also quarter-wave. Some makers tweak lengths.
3. This design is intriguing, since it is considerably smaller than conventional antennas. I am still tinkering.
4. This VHF short counterpoise has 0.3 wave radiator (24.1"), with four radials bent down at 45 degrees and a length from antenna of 6.75". The EzNEC plot shows performance. It is resonant (X~0) near 146 MHz and has SWR of 1.16, with 1.21 on band edges. Would you use that antenna? Absolutely!
5. The UHF version has the same 7.5" radials. This is longer than a quarter-wave length, so the antenna radiator must be near a quarter wave at resonance. The antenna height is 6.0". SWR is 1.1 at 435 MHz and 1.41 on the band edges, also a very respectable performer.
6. Mounting height of 10" or 10' makes little significant difference. The counterpoise radial length is not critical. But one-half inch difference in the vertical element doubles the SWR, but that is still good.
7. The vertical component of a downturned counterpoise creates a dipole opposite the antenna. With four radials, the equivalent counterpoise effect is near 20". Does that look familiar? It is one-quarter wavelength for VHF, a perfect match.
8. Undoubtedly, improvements can be made to the model, but this is a good first cut for reduced length radials.
9. The design illustrates a common saying, every installation is unique. Do not assume any part is sacrosanct. It may be good, just not for this installation. Do real research, not opinion forums. Ask an experienced Elmer for help.
10. Life is good. Enjoy!



Freq	144 MHz	Source #	1
SWR	1.36	Z0	50 ohms
Z	44.34 at -16.04 deg. = 42.61 - j12.25 ohms		
Refl Coeff	0.1532 at -113.56 deg. = -0.06122 - j0.1404		
Ret Loss	16.3 dB		



Freq	420 MHz	Source #	1
SWR	1.41	Z0	50 ohms
Z	53.15 at -18.84 deg. = 50.3 - j17.16 ohms		
Refl Coeff	0.1687 at -79.29 deg. = 0.03136 - j0.1657		
Ret Loss	15.5 dB		

