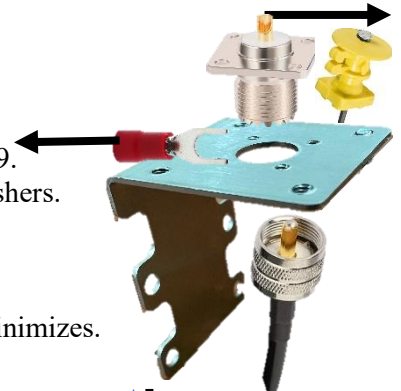


Ham 122 – Antenna Build

Dr. Marc & Rosemary © 230711

1. The first thing most hams build is an antenna. This build will be a dipole and a quarter-wave counterpoise.
 - a. For entry level, we provide specs, parts list, design, and guidance for 2-meter.
 - b. For more advanced, you can build HF. At the pinnacle, use EzNEC modeling to create your own system.
2. Builds are a dipole with SO-239, counterpoise with SO-239 for quarter wave or with NMO for COMPACTenna.
 - a. Brett bracket is a stainless steel mount used for all builds.
 - b. Normal radiator and return are one-quarter wave. Length should be optimized.
3. **Dipole** is simple and very powerful with gain over 7 dBi. Directional, hi-gain, long.
 - a. From EzNEC model, the acceptable length is 19.2” for radiator and for return.
 - b. Cut two lengths of #14 insulated wire. Solder end of radiator to center of SO-239.
 - c. Crimp fork to end of return. Attach connector to bracket with 10/32 bolt and washers.
 - d. Attached SO-239 to bracket with 6/32 bolts. Mount bracket as high as practical.
 - e. Stretch return horizontal to earth. Route radiator horizontal or vertical.
 - f. Keep wire from touching wood or metal with electric fence insulators.
 - g. Test with meter. If minimum SWR is at low frequency, fold ends back until it minimizes.
 - h. For HF, the only change is to adjust length of radiator and return.
4. **Counterpoise** is a bracket with four radials for balanced performance.
 - a. Radial material can be tubing, #6 solid copper wire, steel rod, or coat-hanger.
 - b. Get four fork connectors to fit the rod material. Spread opening if necessary.
 - c. Cut four rods to 18.75”. Crimp fork to one end of each rod. Solder the crimp.
 - d. Hold connector with pliers. Bend rod down to 45 degrees (Increases Z to lower SWR.)
 - e. Attach to bracket with four 10/32 bolts and four washers.
5. **Vertical** one-quarter wave antenna mounts on SO-239 connector. Omni, low gain, tall.
 - a. For dual band, use metal rod / wire. Bend to length. Solder rod to SO-239 terminal.
 - b. One-quarter length (a) is 20.22”. UHF 440 MHz length (b) is 6.7”, (c) is about 10 mm.
 - c. To tune, cut each rod to length for minimum SWR. EzNEC shows 19.0”
 - d. By increasing the radiator to 0.31 wavelength, the radials can shorten to 1/12 λ .
 - e. Mount SO-239 assembly to bracket through hole. Use 6/32 bolts.
6. **COMPACTenna 9”** is the Near-Line-of-Sight hi-performance, omni antenna.
 - a. Mount ‘NMO to SO-239’ connector on bracket. Attach gasket & antenna.
 - b. In metal sheathed attic, mount COMPACTenna near floor for NLOS.
 - c. COMPACTenna makes an excellent counterpoise, if you prefer to buy.
7. **Mount bracket** to support using screws, U-bolts, or hose clamps.
 - a. Use pipe flange with PVC or EMT conduit for support in attic.
8. See Ham 54, Ham 56, and Ham 67 for more illustrations on website.
9. Life is good. Enjoy!



#	Device	Vendor
1	Bracket	Brett
2	Hose clamps 1-1/2”	Hardware
4	10/32 -1/2” bolt	“
4	Flat washer	“
4	Lock washer	“
4	6/32-1/2” bolt	“
1	Fork terminal #14	“
4	Fork Terminal #10	“
4	19” rods	“
1	27” rod	“
40”	#14 insulated wire	“
1	1” pipe- flange mount	“
1	NMO to SO-239 connect	Amazon
1	SO-239 panel mount	DxE/ HRO
1	COMPACTenna 9”	DxE/ HRO
4	Fence insulator	Tractor Sup

