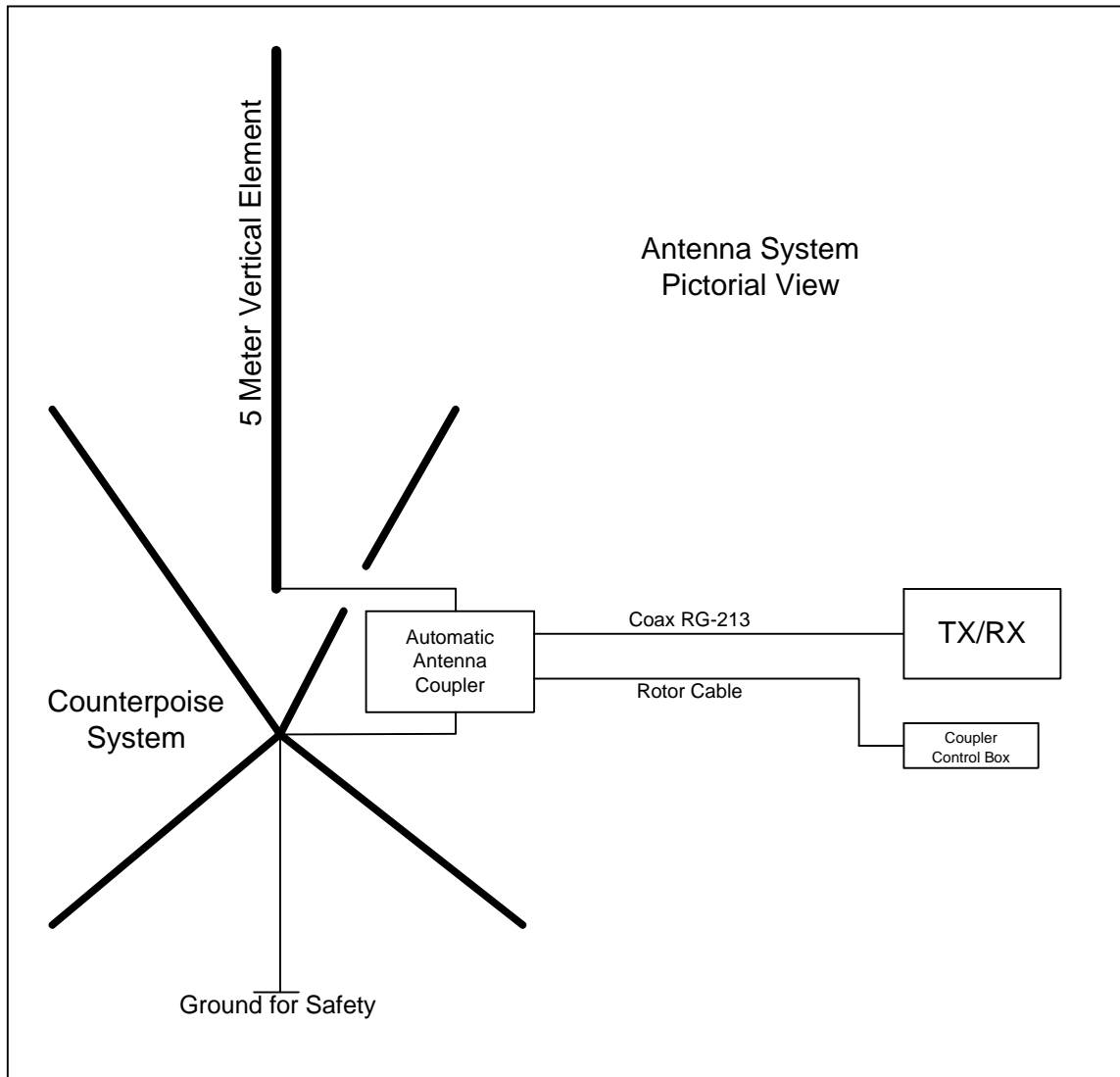
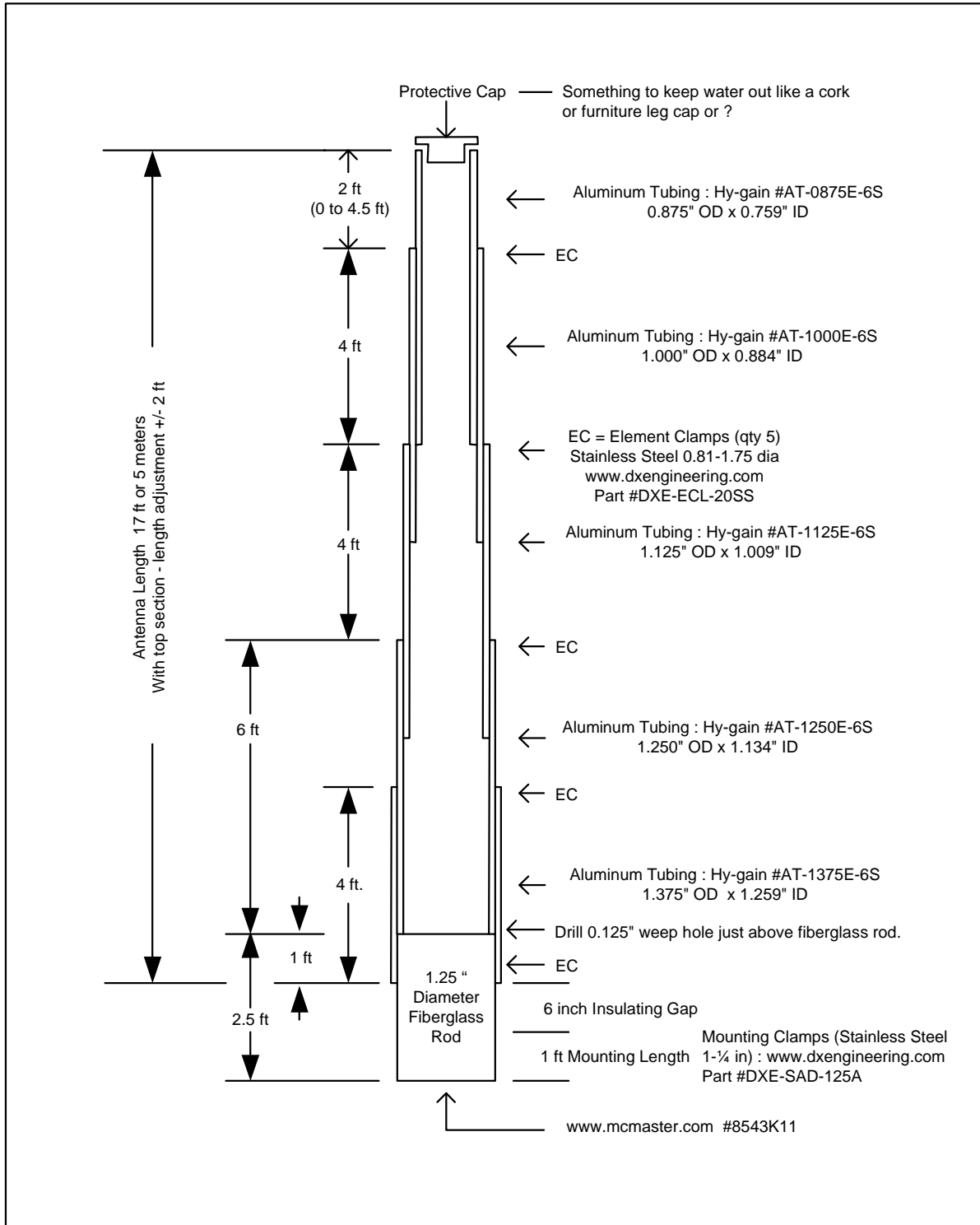


A 5 meter vertical antenna that can be easily matched from 40 thru 10 meters. With a good counterpoise it will even work for 80 meters. With the 5 meter element, the basic antenna is a $\frac{1}{4}$ wave on 20 meters.

An updated version of a vertical that was connected to a trans-match with open wire transmission line and was common in the early years of amateur radio.



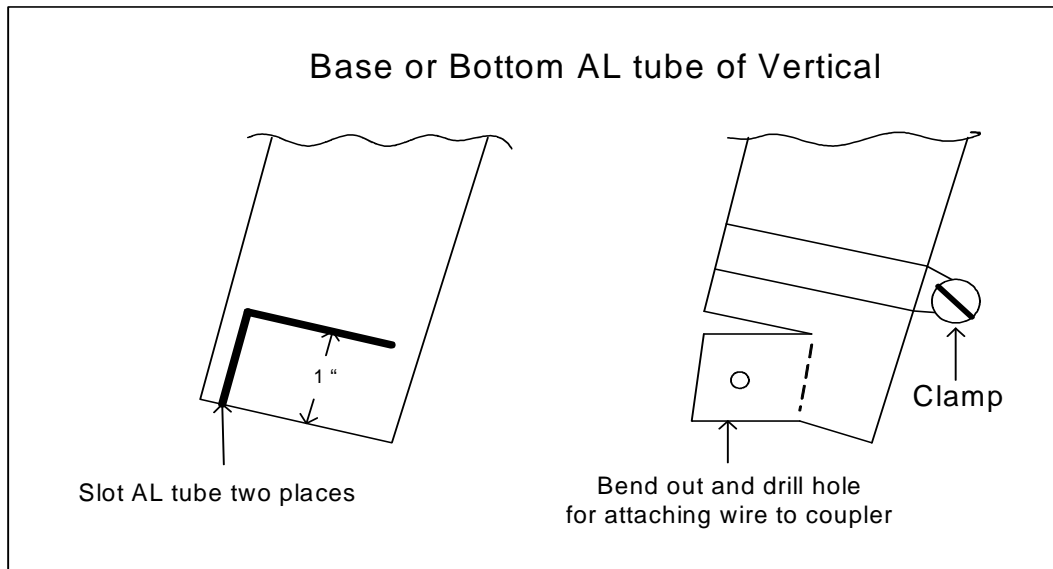
The 5 meter vertical element construction:



Additional Notes:

The suggested AL tubing is 6 foot long and has one slot at one end of the tubing. It is recommended that an additional slot be made on the opposite side to allow easier compression of the tubing by the clamps at each transition. Also note that the vertical will work just fine with whatever the material diameter or section lengths that may be available from other sources. Overall length should be the nominal 5 meters. The size and sections of tubing shown is strong enough to easily support a flag at top of vertical.

Connection to base or bottom of the vertical can be made by any means, however it should be a secure connection as the wide range of antenna impedance will also mean that the current to the antenna could be as high as 10 amps and the voltage to the antenna could be as high as 1000 volts. So use a large size wire with good insulation from the antenna coupler. A good choice is to use the center conductor (strip off the shield) of a piece of RG8 or RG213 coax. Below is an example of a secure connection to the AL tubing.



The counterpoise or radial system is an essential part of the vertical and it will determine the final effectiveness of the antenna. Since the counterpoise can be the hardest part of the vertical to implement, an actual counterpoise design will not be shown. In general the counterpoise is all the radials one can muster and can take the form of wires in the ground, metal fence, or elevated attached to a metal roof or with radial wires on the roof. Wires longer than the length of the vertical (5 meters) is likely to be of no value. There are many articles in amateur material about counterpoise or radial systems. The connection of the counterpoise to the antenna coupler should be secure with a large gauge of wire.

When using an automatic coupler like the SG-237, the length of the coax to the TX/RX will not be a significant factor for loss on the HF bands. If the antenna is close and the coax is not more than 30 feet, then an antenna tuner at the TX may work just fine. When using the automatic coupler, it is handy to have an SWR meter in line just to see that the automatic coupler is working. You can actually watch the auto process as it finds the match.

The cable to connect to the control box needs to have wires large enough to carry the power required to the automatic antenna coupler. Standard rotor cable that has two 18 gauge wires along with wires for the other function will work well.

If you have access to an antenna analyzer like the MJF-259B, measure the antenna impedance ($R \pm jX$) at the base of the vertical as a function of frequency just to see that the antenna is functioning as expected. The plot of my antenna is below:

