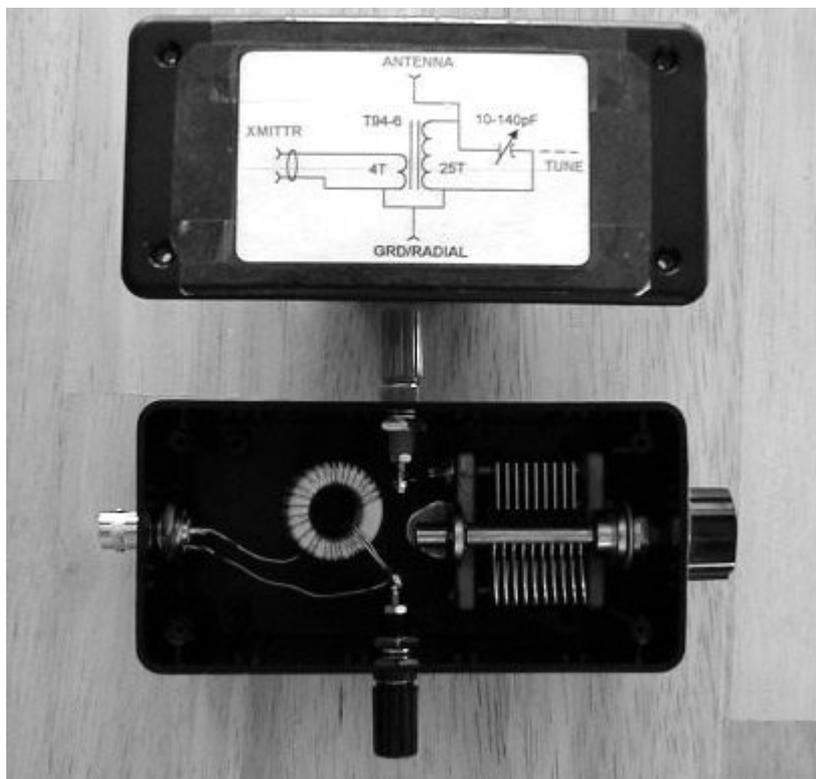


End Fed Half Wave Antenna Tuner



The End Fed Half Wave Antenna (EFHWA) is a popular antenna for portable use. There are very few simpler antennas. The EFHWA is nothing more than a 1/2 wave length wire radiator and a single 1/4 wave length wire radial. It can be put up in several different configurations. Some of these are: vertical, inverted vee, inverted L, half square, sloper, and many more ([see Figure 1](#)). The main advantage of the EFHWA is that it does not have any feedline. No feedline means no feedline loss. It also means one less thing to carry to the field. The EFHWA presents a very high input impedance - usually in the 4-6K Ohm range. This high impedance has to be transformed to something closer to 50 Ohms in order for a typical transmitter to load it. That is where this antenna tuner comes in. The picture above shows my tuner. This unit tunes the antenna directly and is not a transmatch. The design consists of a simple parallel resonant circuit with a coupling link and will tune from below 7 MHz to above 21 MHz. The capacitor is a surplus unit I paid \$1 for at the 2001 Ft Tuthill Hamfest and appears to be an old Hammarlund unit. It has a range of 10-140pF. I chose an inductor of 4.5 uHy. This inductance allows the antenna tuner to be useful on both 40/20 meters to match my 40/20 meter dual band transceiver (currently under construction). I chose a T94-6 core to wind the inductor on. 25 turns of #22 wire on this core produces approximately 4.5 uHy. Other cores could have been used just as well. The link for the transmitter was found experimentally. I started with a 5 turn link, tried 6 and 7 turns, but settled on 4 turns. This link is wound over the "cold" or ground end of the 4.5 uHy coil. The ground side of the link is connected to the cold end of the 4.5 uHy coil and to the shaft of the variable capacitor. The ground side of the BNC connector is also connected to this point. The other end of the 4 turn link connects to the center of the BNC connector.

Using The Tuner

The 1/2 wave antenna wire should be erected in your favorite configuration. I like inverted L's because I get both vertical and horizontal radiation. Connect the 1/2 wave wire to the top of the parallel resonant circuit using the red colored binding post. A 1/4 wave radial is connected to the ground side of the resonant circuit, using the black binding post. This radial can be laid on the ground and will decouple any RF on the outside of the coax which connects the transmitter and the tuner. A small amount of RF is applied to the tuner/antenna and the variable capacitor is adjusted to achieve resonance and lowest SWR.

Performance

Using a 5K dummy load (five 1K Ohm resistors in series) connected between the binding posts, this tuner produced an SWR of less than 1.3:1 from 7 to 21.45 MHz. I did not measure the lowest frequency obtainable but it may go down to as low as 5 MHz or so (I'll be ready for 60 meters when it opens up!). I estimate the tuner can handle maybe 25 watts or so. The spacing on the variable capacitor is the main power limiting factor.