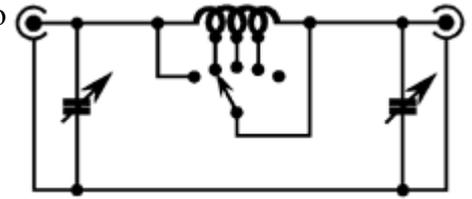


HF Aerial Matching Unit

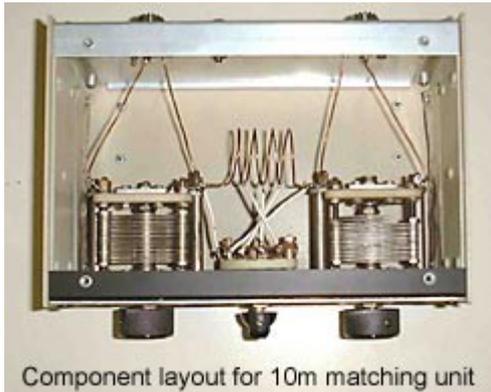
This will allow the aerial to be used right across the 10m band without the need to physically adjust the elements, and offers a virtual 1:1 VSWR at 50 ohms impedance to the transmitter. The unit is designed to be positioned in the shack adjacent to the VSWR meter and the transceiver.



10m matching unit

Construction

The unit is best constructed in an enclosed metal box. I used what was to hand, being a discarded aluminium alloy enclosure approximately 3" x 8" x 5" (h-w-d). The two variable capacitors can be "broadcast receiver" type with a maximum value of around 300 to 500 pF - these have a plate spacing which is usually good to about 100 Watts of RF in this configuration. If you want to run more power, then choose capacitors with a suitably wider plate spacing.



The switch should be a "Yaxley" type rotary switch. Again, if you are running less than 100 Watts, anything other than a real sub-miniature one will be sufficient. For full legal power limit I would suggest using a ceramic type rotary switch. The coil is self-supporting and consists of 4 turns of 18 swg copper wire, tapped at each turn, and wound to a diameter of 1", with the turns spaced 0.25" apart. Any kind of wire can be used, i.e. tinned, enamelled, etc. I used the earth wire from some offcuts of twin & earth mains cable.

Provide two suitable connecting sockets on the rear of the unit - I used SO-239s as these were to hand, and fitted in with my existing HF plug and socketry in the shack. BNCs would be fine if these are to hand. Use control knobs that have pointers, and apply a marked scale to the front panel for both

capacitors and the switch.

Adjustment and Use

Once the wiring inside the box is completed, close the lid. This will prevent anything from physically interfering with the wiring, and reduce any radiation of RF within the shack. If you have a grid dip oscillator or antenna analyser, this can be used to roughly set up the matching unit controls. Otherwise, connect up as per diagram 2, set all controls to mid-way, and tune to a convenient spot on the 10m band.

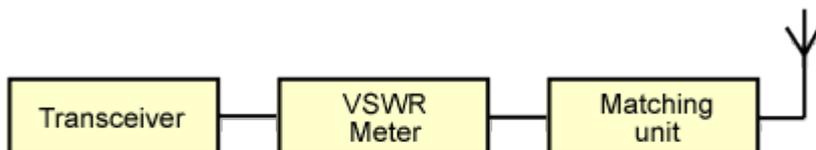


Diagram 2. Use 50 ohm coaxial cable to join transceiver to VSWR meter, and between VSWR meter and matching unit. Matching unit to aerial also uses the same type of cable.

Take a good long listen on the frequency to ensure that it is not in use by another station - you may only hear one side

of any QSO that might be taking place. Adjust the transmitter for minimum power output, key the transmitter with a continuous carrier for just a couple of seconds at a time whilst twiddling the matching unit controls. You are looking for a dip in the reflected power, i.e. to reduce the standing wave ratio to as near to 1:1 as possible.

If you cannot obtain a good low reading just by swinging either or both of the capacitors, switch to another coil tap setting and try again. Once you have found the best match, make a note of the frequency and the settings of all three controls. Do this at several intervals across the band, and you will see a pattern emerging of where the controls need to be set for a given frequency. The losses in this matching unit are pretty low, but it is nevertheless a compromise. However, it will enable you to go from one end of the band to the other without having to go and physically adjust the aerial. Although primarily designed for 10m, it can be used on other HF bands to good effect.