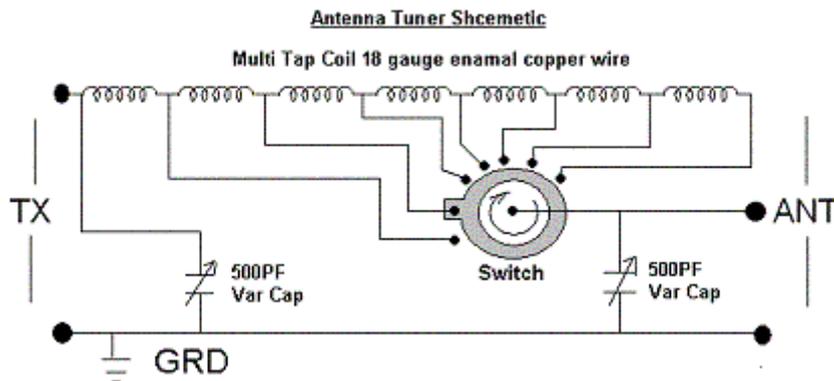


## Aerial Tuner Basics

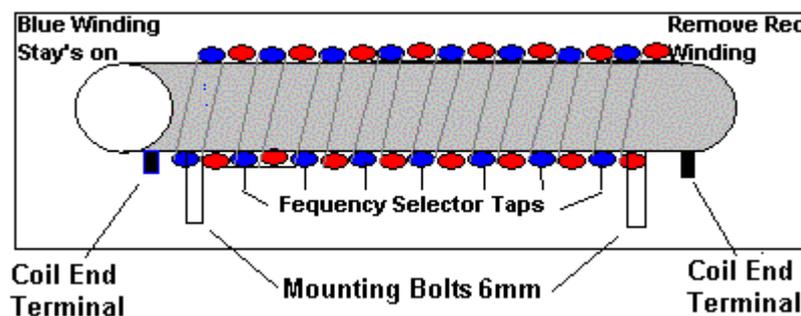
If you plan working all the HF (for beginners that's High Frequency) Bands 1.8 to 30 MHz with a long wire or dipole antenna you will almost certainly need to use an aerial tuner unit to get a good SWR on each band, this is also a good piece of equipment to use for short wave listeners as it will ensure your antenna is resonant at the frequency your listening on increasing signal strength's 3 or 4 points.

Below is a basic tuner that can easily be built using a hand full of components and a few very basic engineering skills.



Left is a schematic of a Basic antenna tuner that will work well on all bands 1.8 to 30 Mhz, all you need for this project is an aluminium box with dimensions of 10 inches wide x 4 inches high x 8 inches deep, a roll of 18 gauge enamel copper wire, 2 var capacitors 500pf wide air spacing, a 10 way rotary switch, 2 PL259 sockets, and a piece of 1 1/2 inch plastic piping, sink waste pipe is ideal for this.

Below are the details of construction, including the winding of the coil, (Most Important) take care with this and take your time on it.



Lets start with winding the coil then, this is wound spaced 1 x 18 gauge and we do this by winding 2 coils side by side and removing 1 of the windings when the coil winding is complete, this gives even spacing over the whole length of the coil and gives a professional finish.

Now cut the piece of plastic piping to fit in the aluminium box leaving a 1 inch gap at each end, drill a whole at each end of the tube about 1/2 an inch in and put two 6mm mounting bolts into the tube making sure they both point equally downward, now leaving a suitable gap of 1/8 of an inch from the mounting bolts wind the coil as follows:

Take two length's of copper wire equal in length and mark one as the spacer to be removed later, fix one end of the wire's to the left hand coil end terminal, and then carefully wind the 2 wire's round the tube, every 10 turns make a loop for the frequency selector tapping in the turn to be left on, remove the coating to leave bare copper for soldering too, and twist three or four times, continue to the end repeating these steps, at the end fix the coil with the taps on to the other end terminal, now carefully remove the spacer coil, this will leave you with a 1 turn spaced coil with tapings fixed to a terminal at

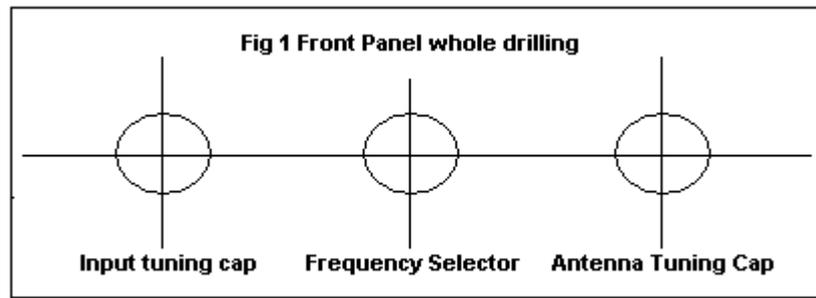
seal and hold The coil in place on the plastic tube, you

each end, now we will use some clear spray on varnish to

will need to protect the tapings from the varnishing

process so they can be soldered without having to clean them again, the coil is complete.

Now mark the rear wall of the aluminium case to take the coil mounting bolts, do this by offering the coil into position and making a mark where the coil mounting bolts need to be, now drill the box but do not fix the coil to the box at this time.



Now Mark the Front wall of the box to mount the rotary frequency selector switch and the two tuning capacitors as shown in fig 1 (below)

Left is the whole drilling for the aluminium box, once this is complete there are only two more wholes to drill, these are for the PL259 input and outputs, you can have these mounted either on the rear of the case or on either end of the case to suit your own needs, but remember if you choose to mount them on the rear of the case leave enough room for the coil mountings and coil on the inside of the case.

OK so all wholes drilled time to make the final assembly, first mount the rotary switch and tuning capacitors on the front panel, next mount the two PL259 sockets in your chosen place on the case, then mount the coil assembly to the rear wall of the case.

Now its time to wire it all up, first connect a wire from the input PL259 socket to the left hand coil connector, now connect another wire from the output (antenna) PL259 to the centre of the rotary frequency selector switch, a wire now needs to be run from both PL259's to the respective tuning capacitor (input to left output to right), now to connect the coil taps to the rotary switch, run a wire from each coil tap to a switch gang, if you have chosen a rotary switch with enough gangs on it to connect every tap on the coil then all the better, if not miss out every odd tap on the coil and connect the next one (But the more taps you can connect the better), so ideally use a 1 way 12 gang switch, you should then be able to connect all the coil taps, remember to connect them in order moving along the coil and round the switch gangs. that's it your done.

Testing: connect an SWR Meter to the antenna socket on the tuner and connect a 50ohm dummy load to the antenna socket on the SWR meter.

Now connect a transceiver to the input side of the tuner, and set the transceiver to its lowest power setting to avoid damage from high SWR, select a band say 80 meters first, key the radio in FM mode and note the SWR, now rotate the frequency selector switch on the tuner until the lowest SWR reading is obtained, on 80 meters this will be towards the end of the tuners coil (Most Windings), now turn each tuning capacitor until a dip in the remaining SWR is found (Best Match).

Now do the same for each band, noting the switch location and capacitor setting, make a note of these and using a template marker, mark the tuner front panel accordingly, that's it all done.