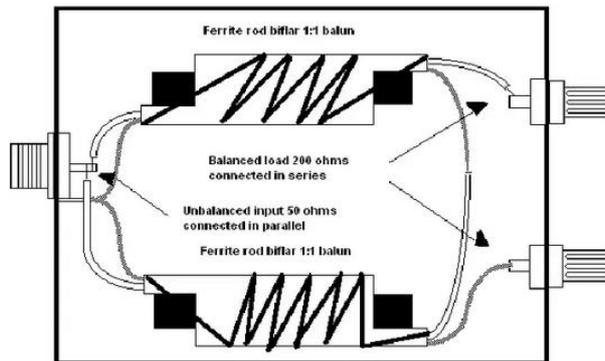
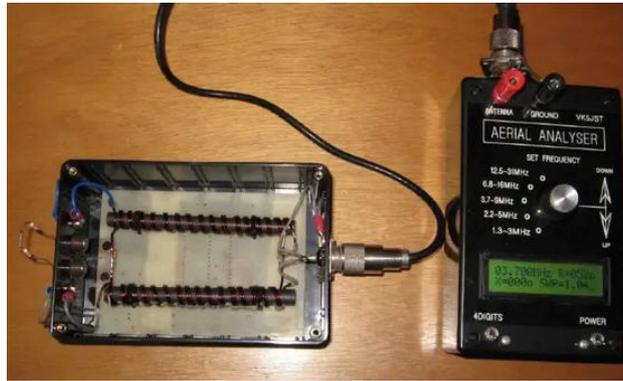


# Guanella 4:1

Most articles on building the Guanella 4:1 Current balun use one or two toroids. For the range 1.8 MHz to 28 MHz. The 61 ferrite mix seems to be the best for this application ( permeability 125). Due to the high cost locally of ferrite toroids and having successfully built a number of 4:1 Voltage Baluns using ferrite rods I decided to use two ferrite rods as the cores. How to select rods with 61 mix: If the rod still has its coils attached and there are two coils it is most likely the 61 mix as the second coil is for the low end of the short-wave band. Be careful if cutting ferrite rod as they break easily using the nick and tap method is not recommended, rather cut all the way through with a good hacksaw. I used 1mm formvar covered copper wire as bifilar windings which will give close to 100 ohms impedance. You will need about 3 meters of wire if using 12mm rods about 110mm long. Cut the wire into four equal pieces. Now taking two pieces of wire (bifilar) wind onto a ferrite rod keeping the two wires parallel and close coupled. Press onto the rod with your thumbs and wind on 15 turns spaced evenly over the ferrite rod. Check with a multimeter and mark one set of wires at each end with white paint or correction fluid. Now repeat for the second ferrite rod You should have two 1:1 current baluns wound onto ferrite rods. To arrive at a 4:1 balun you connect the unbalanced 50 ohm input end in parallel to a S0239 socket. The balanced 200 ohm end is connected in series and to binding posts for your twinlead . Don't forget to connect the earth wire winding (lets say the white point marked wire) which has been joined in parallel at the input 50 ohm end on to the mounting plate of the S0239 socket. I ran a small bead of hot melt glue down the sides of both coils to anchor the turns to the ferrite and mounted the rods on a piece of glass fibre board with small cable ties. The board is mounted to the box with our old friend foam double sided tape. If you have an Antenna Analyser or Noise Bridge you can test your balun with two 100 ohm resistors in series. You are looking for an impedance of close to 50 ohms and no reactance. In building my Voltage baluns I used insulating tape as insulation on the ferrite rod and on the copper formvar wires mainly to keep them closely bound together as I was using 1.8 mm copper wire which is more difficult to wind on the 12mm rod.



The Guanella 4:1 Current Balun tested with two 100 ohm resistors in series and an Antenna Analyser gave the following results

Freq MHz	SWR	R	X
1.85	1.3	48	12
3.70	1.0	52	0
7.10	1.0	53	0
14.10	1.1	55	0
21.20	1.15	57	0
28.50	1.2	60	0

The coax feedline was checked at 100 Watts for any common mode current using my homebrew balanced current probe and found to be clean.

A photo of the RF Current Probe is attached . Not those ferrite rods again! The pins are for a smaller slot insert RG58 and wire antennas.

