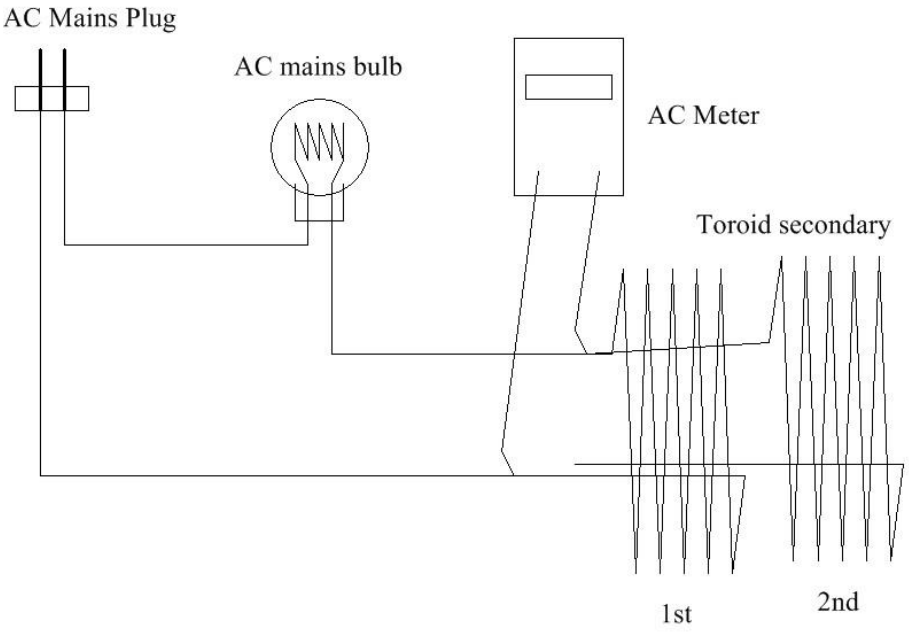


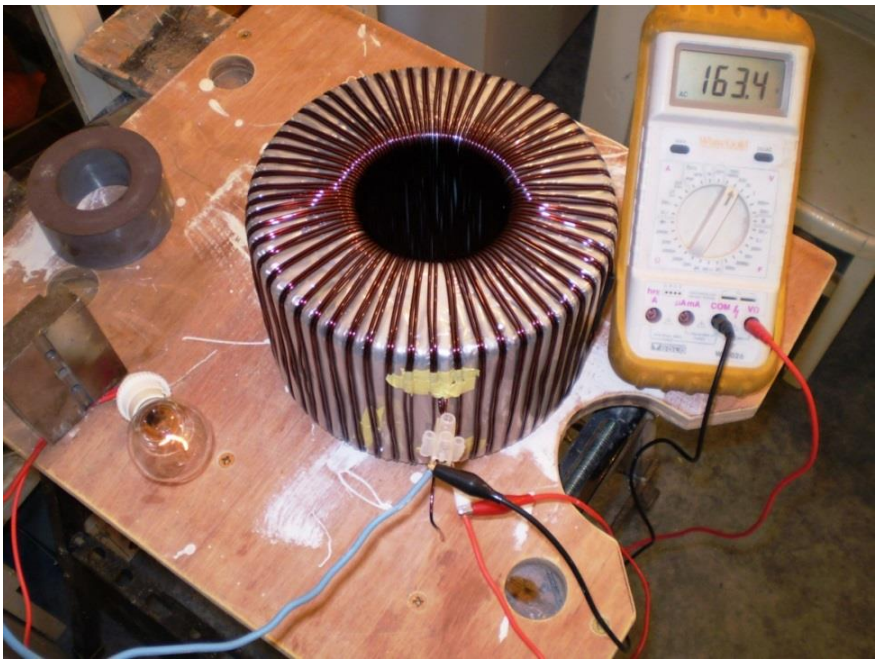
The secondary basic test circuit.

WARNING THIS IS HIGH VOLTAGE

Here I am using a 20 watt 230vac light bulb and fitting.
Test the first secondary winding, switch off the mains leave the first connected as is, but now connect one of the test meter croc clips/connectors to the second wire that is sticking out from your second secondary winding. Reconnect the mains again and because the transformer is working the second will now have an induced circuit, and this should read the same voltage. If not, then remove or add a turn on the winding.

Do this test with each of the four secondary's you are adding, all should read the same voltage.

This photograph on the right shows what the voltage is reading on the multimeter.



Testing each secondary winding.

The below photograph shows the Blue cable coming from the mains plug is connected to both starts of the first and second winding of the secondary.

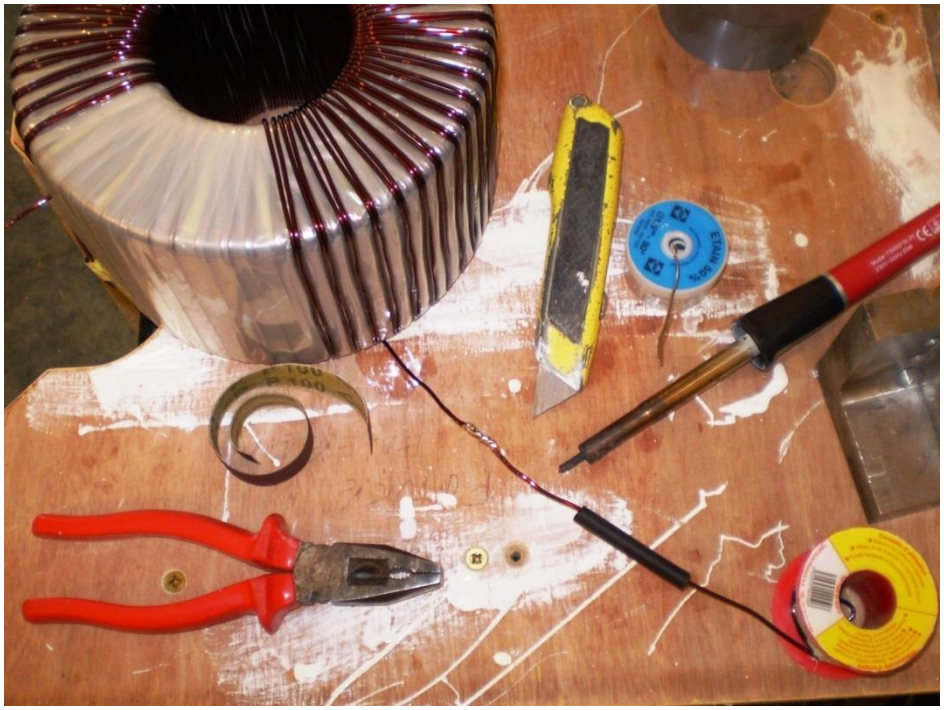
The Red cable in the below photograph is coming from the light bulb and is connected to the finish copper wire of the first secondary winding only.

In the photograph on the right the Red Croc clip of the multimeter is now connected to the finish copper wire of the second winding of the secondary.

With the light bulb On, The toroid is now working and inducing a AC voltage in the second winding of the secondary. The voltage should therefore be the same.

Winding the secondary, continued..

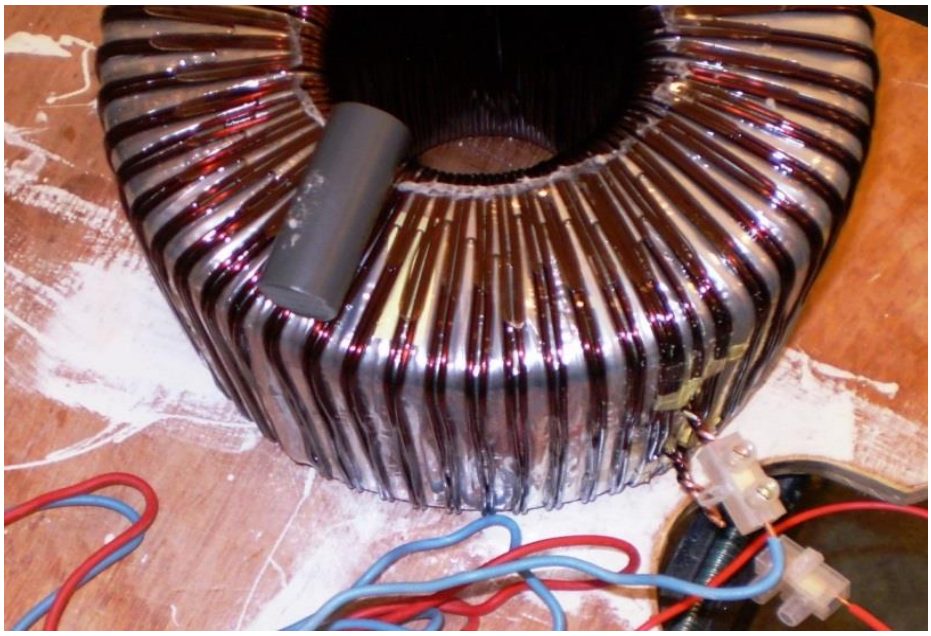
As the bobbin diameter is reduced you may have to do joints in the secondary windings, here is my method that gives a permanent strong insulated joint.



I clean the ends of the copper wire to remove the enamel by using the knife blade, ***(Note some enamel coating is very hard to remove, some its easy)*** , then remove any residual coating and clean with some emery paper. On the new wire I insert a piece of glue lined heat shrink insulation tube , sufficient to cover the joint. I place each wire end alongside each other and twist them, then do a good solder joint so the solder flows.

Allow to cool then slide the glue lined

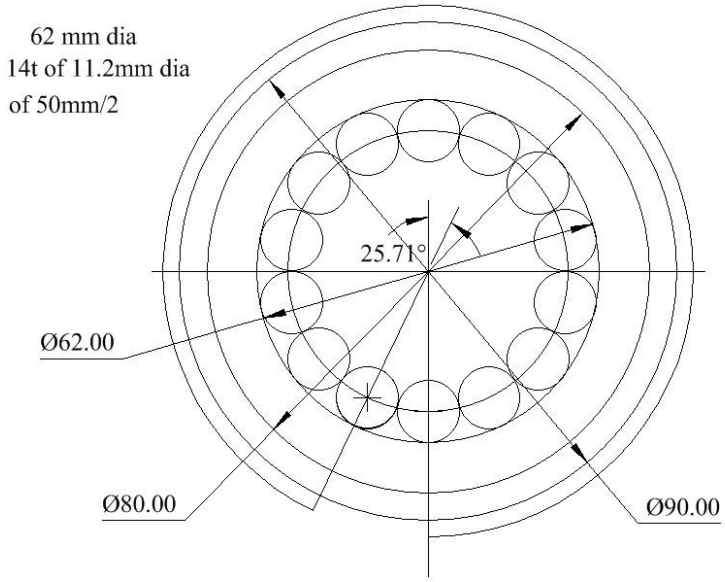
heat shrink tube up and covering the joint, and gently use the heat gun with



hot air and the tubing will shrink and the internal glue will melt.

Above Right, here is the fourth secondary winding on and the appropriate epoxy went on the previous evening. Using a nylon roller to run round and push any epoxy flashings into the windings gaps. This photograph also shows the In and Out of all 4 secondary windings temporarily twisted together for testing purposes. Those 4 pieces of copper wire represent each of the four secondary windings, and each has got longer as the toroid diameter increases. These I use for getting the approximate length of wire for each secondary onto the spool/bobbin.

My spools/bobbins are now getting smaller as that centre hole diameter decreases with copper wire going through the centre.



Here is a card template drawing with an original core hole diameter of 90mm, to check to see if I can get the 14 turns off 50mm2 cable Primary neatly in the centre hole. As you can see 90mm hole ends up very tight.

The above photograph shows the first of the final Mylar wrapping Insulation tape going on, after the final epoxy covering. I use that USA Mylar thick tape as the final Mylar wrap.
The secondary windings are now joined in parallel, so each of the four start secondary's are joined together and the ends of the secondary's are joined together. Just do a quick check with the multimeter set for resistance for any shorts, we do not want shorts.

Winding the Primary

We are using 14 turns of 50mm/2, 11.2mm outside diameter, 6m long, insulated stiff, copper wire. This type of cable is generally used as a hook up cable within trunking etc. It's the stranded stiff copper wire as it will bend and take a set around the toroid.

My trusty work bench is now attached with clamps to a car trailer.

I start at half the cable length, for this OzInverter it was 6 meters long but 6.5m would have given me a little more room. If it was 7 meters, then I could have another turn to 15. But 14 is still okay.

I use wood wedges and shaped wood blocks to keep the inside tight. But care must be taken to avoid damaging the Mylar and the secondary winding, and the primary cable insulation.

Using each end to pass through the centre and then pull tight on every corner, gently tapping with a wooden mallet so each turn stays in place. I use sash cramps to keep each new turn in place then start the next.