

BALUN construction

This is based on the info from: <http://www.iw5edi.com/technical-articles/homebrewing-a-balun>

This site is in French, so a Google translation was used.

Building a Balun

50/300 Ohms

Operating from 3 to 30 MHz

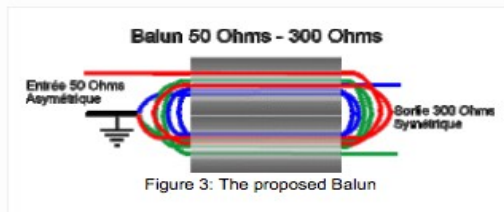
Building a Balun is a relatively simple job. You are offered here the realization of a Balun 50 Ohms asymmetrical / 300 Ohms symmetrical. The transformer uses two ferrite tubes, material 43. The size of the tubes will depend on the power to pass. The tubes offered here are, for example, two Fair-Rite, with an outside diameter of 19mm, an inside diameter of 10.5mm and a length of 50mm.



The realization of a Balun requires several windings, 3 in our case. To define what a winding is, it is easier to illustrate it by Figure 2.



The Balun 50/300



We start by making 2.5 turns (blue), starting from the side 300 Ohms. The other end is connected to ground, at the level of the input socket. This will also be the common point of mass. Starting from the ground, we rewind again 2.5 turns of wire (green) which will end at 300 ohms. Always from the ground point, we rewind again 2 turns (red) which will lead

to the input socket (PL).

The diameter of the wire will be chosen so as to occupy the entire tube.

By keeping the same principle, we can make different adaptations while respecting the number of turns given by the following table:

Adaptation Blue Green Red

| | | | |
|--------|-----|-----|---|
| 50/50 | 1 | 1 | 2 |
| 50/110 | 1.5 | 1.5 | 2 |
| 50/200 | 2 | 2 | 2 |
| 50/300 | 2.5 | 2.5 | 2 |
| 50/450 | 3 | 3 | 2 |
| 50/600 | 3.5 | 3.5 | 2 |
| 50/800 | 4 | 4 | 2 |

On a fictitious load, the TOS that can be raised does not exceed 1.5. The measured losses are 0.4 dB.

The wire may be, depending on the size of either mesh wire, rigid domestic wiring wire, flexible industrial wiring wire.

Example of making a WINDOM type antenna balun



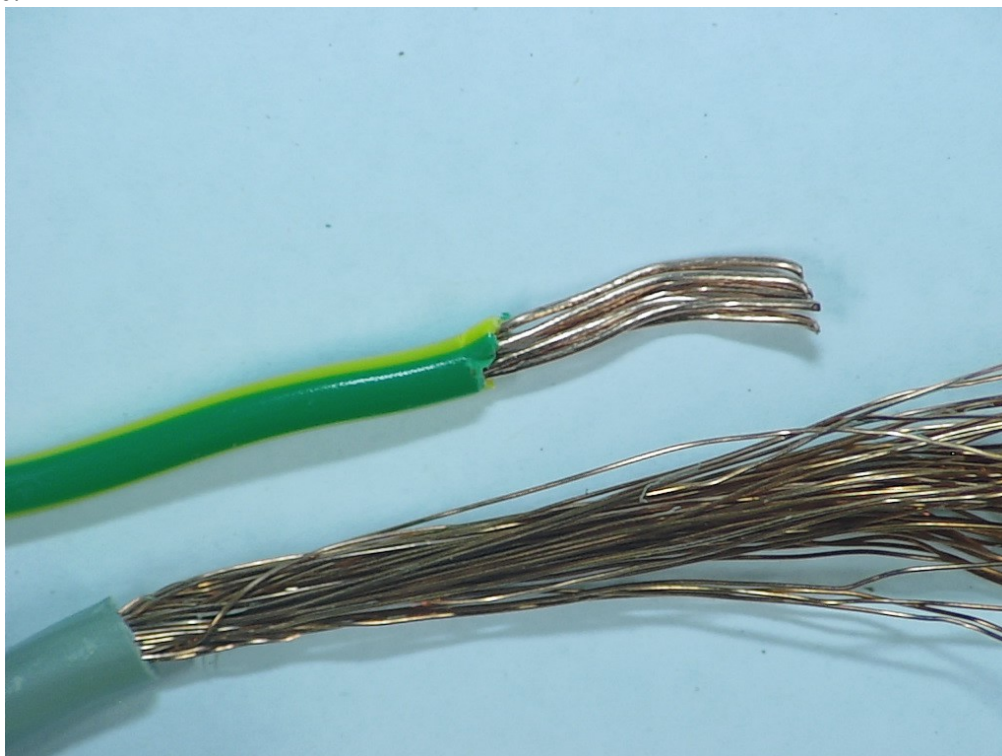
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This is the construction of the 50:300 ohm version. There are 2 windings of 2.5 turns and one off 2 turns.

The BALUN is constructed using 8 x Jaycar LO1238 toroids. They come in a 2 pack for around \$5.00. The case is the HB6127. And a socket of your choice.



The wire used in the original pair was PCV covered Earth wire, and the next versions uses much bigger wire.



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The cores are first super glued together in 2 stacks of 4 cores. I used an old CD drive case to hold them in position.



Then, a length of large heat shrink tube was used to hold the stacks together.



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Sitting the cores on a couple of thick washers to lift them up a bit from the wood block allows the heat shrink tube to wrap around the ends a bit.



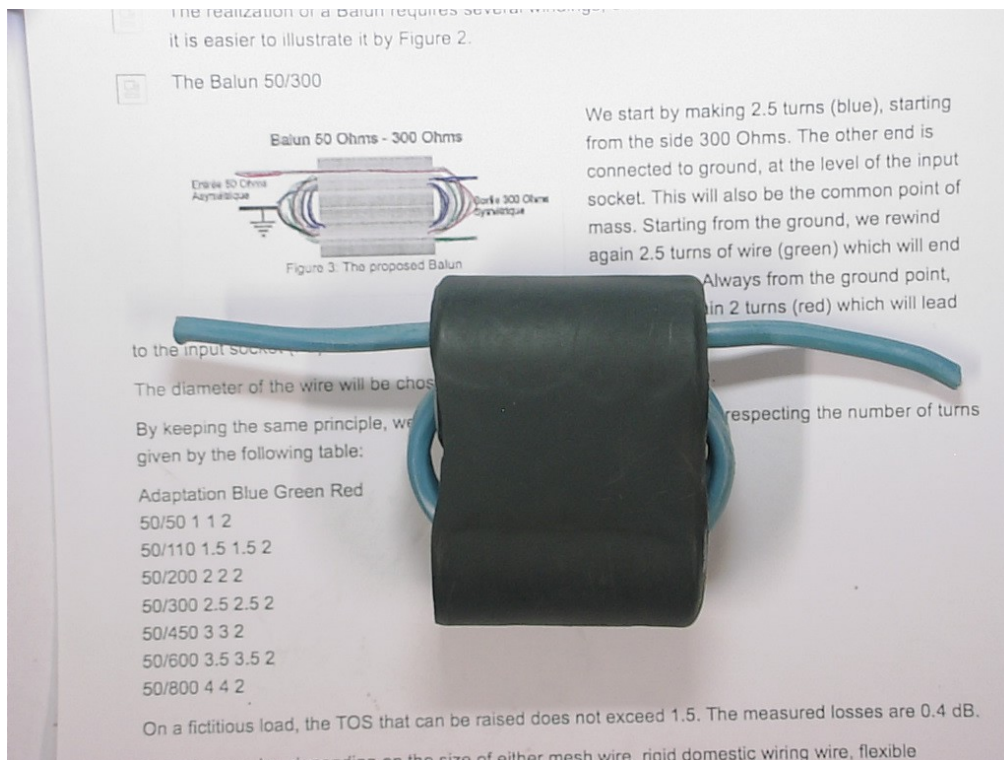
A paint stripper heat gun (on low) shrinks the tube quite well.



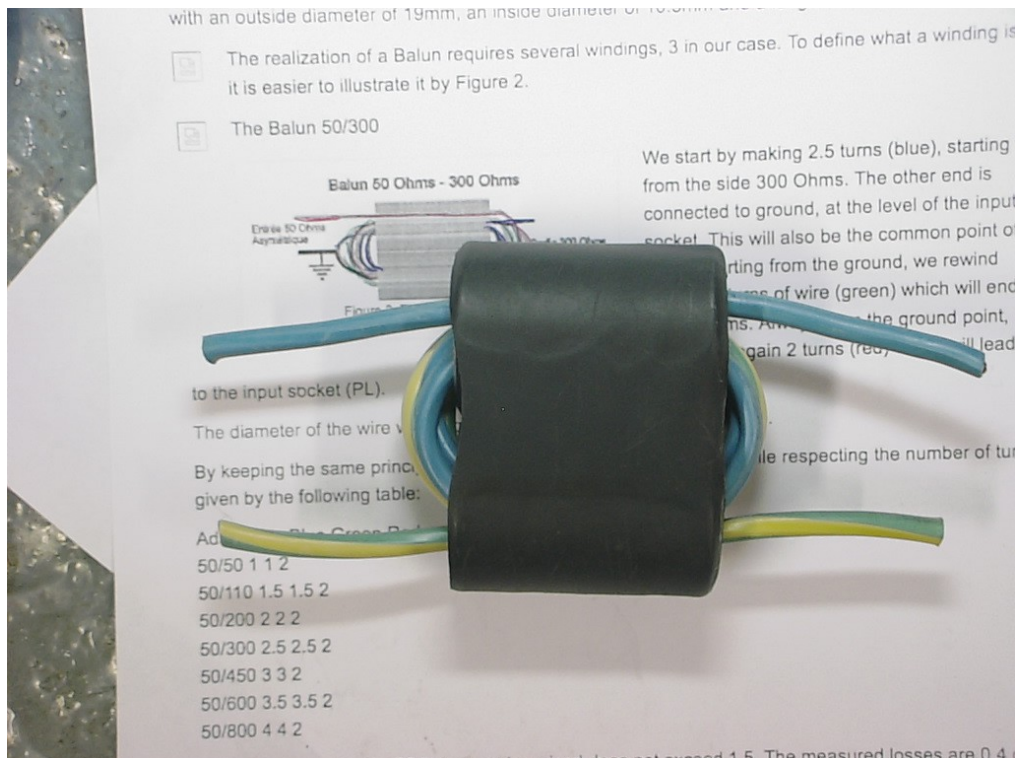
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Following the instructions for the 50:300 ohm version...

First, wind the Blue wire, 2.5 turns, starting from the 300 ohm end.

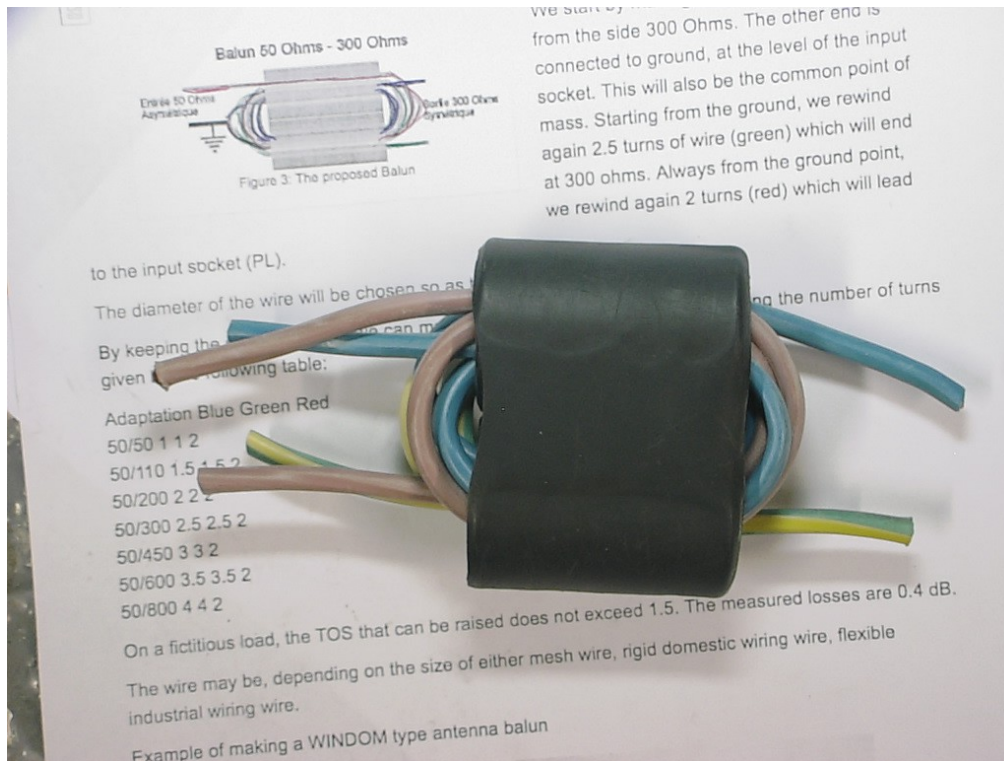


Next, the green wire, 2.5 turns, starting from the Earth end.



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Lastly, the red wire, 2 turns, starting from the Earth end.



Add lugs to the leads for the brass bolts used as the 300 ohm connections.



Those I chose were the Jaycar PT4934 to suit M6 bolts. The core is done for now.

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Now, mark the case for the input socket...




Drill a hole to suit your selected socket type. I used a small hole saw to suit the SO239 panel mount socket



UHF SO239 PANEL Socket SQUARE MOUNT

CAT.NO: **PS0686**

SO239 PANEL SOCKET SQUARE
MOUNT...

 [ADD TO WISHLIST](#)

Then drill out the screw holes. M3 screws work well.

M3 machine screws of various sizes, shake proof washers and nuts are available at Jaycar too.

BALUN construction

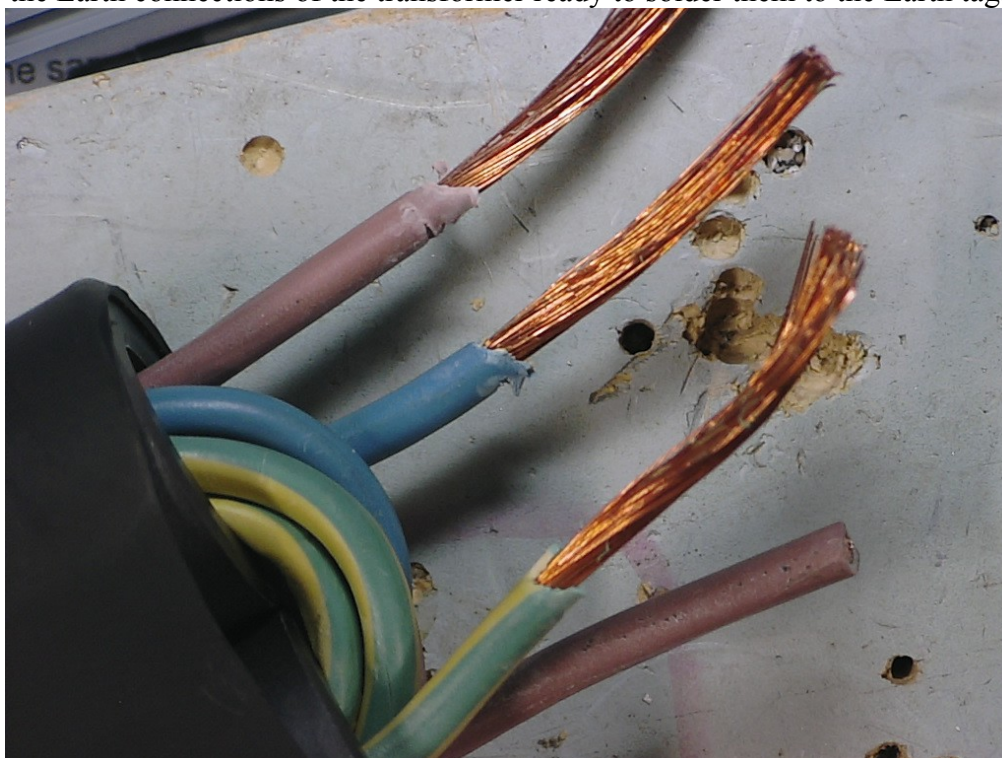
As I have a sheet or two around, I made an Earth tag from tin plate. Solder lugs work ok too.



It is good to see the Earth tag is Dolphin safe!

Mount the socket with the Earth tag or lugs to the end of the case.

Now, strip the Earth connections of the transformer ready to solder them to the Earth tag.



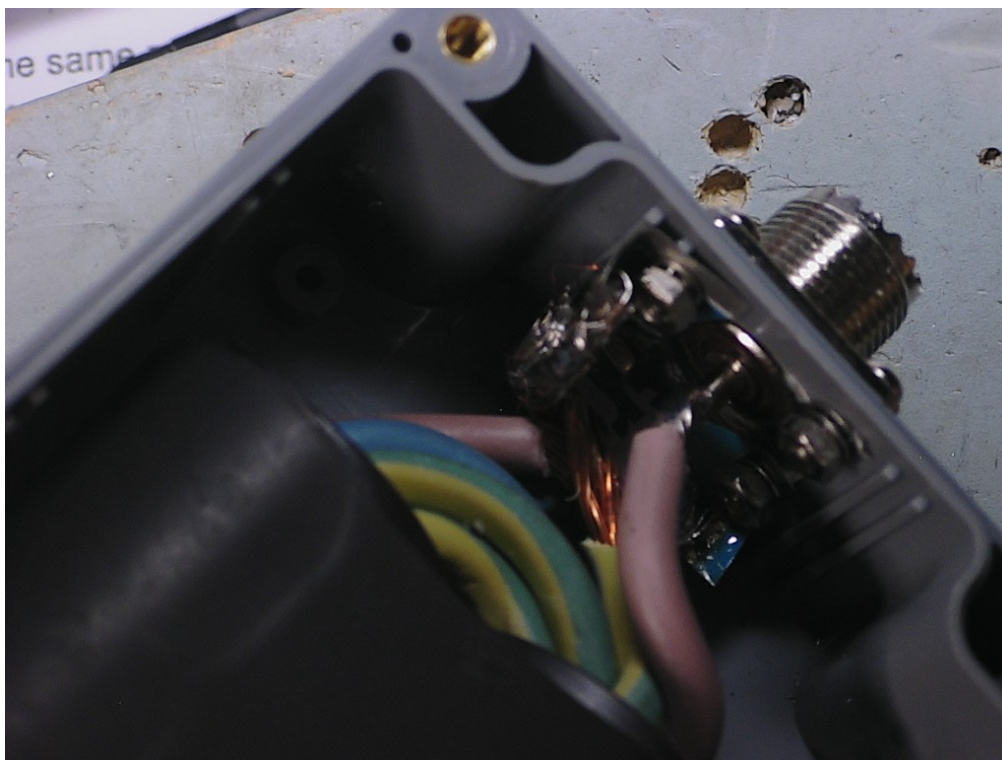
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The way I did it was to separate the 3 wires strands into thirds. Then twist them together so each new earth wire was made up of 1/3 of the strands of each original Earth wire. That may not be necessary if the wires are to be soldered to the manufactured earth tag.

The thicker wires are a bit harder to form into place that the thinner ones were.

After the earth wires are attach to the tag, then strip the hot wire and solder it to the socked centre pin.

It should look something like this...



All that is left is to drill out the mounting holes for the brass bolts and bolt the 300 ohm lugs to them.