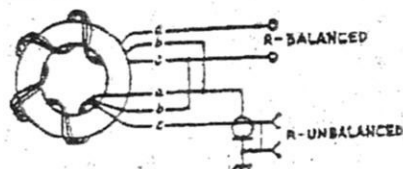


Antenna Balun

The 1:1 balun is ideal for use between a coaxial feedline and a balanced antenna. The balun reduces coax radiation and properly balances the energy for application to the antenna's feedpoint. The Amidon balun also acts as an isolation device and removes the capacity of the coax from the antenna which extends the low SWR frequency range of the array. Baluns made from this kit can be used to advantage on these antenna types: Dipole, Quad, Beam, Inverted Vee, Windom and Folded Dipole.

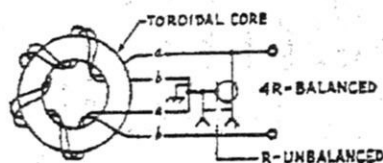
To make a broad band 1:1 impedance ratio balun: Wind 10 or more Trifilar turns on the core and connect as shown in Figure 1. This balun will work from 80 thru 6 Meters and makes a coaxial cable a more suitable feedline for a balanced driven element. The balun will reduce coaxial feedline radiation which is often a strong contributing cause of TVI. The inductive qualities of this balun may make the antenna seem "long" by about 1%. It is usually not necessary that the antenna be retuned or shortened because the balun will extend the low SWR spectral usefulness of the array. The spectral use increase appears to be because the balun isolates the antenna from the large capacitive value exhibited by a long coaxial cable. This balun will handle 1 KW. power.



1:1 BALANCED TO UNBALANCED

Figure 1: The 1:1 Balun

To make a 4:1 impedance ratio balun: Wind 10 or more Bifilar turns on the core and connect as shown in Figure 2. The 4:1 balun will match a variety of hook up configurations - such as: a Pi-Network directly into 300 ohm Twin-Lead; a 75 ohm coax into 300 ohm Twin-Lead; a 75 ohm coax to a Folded Dipole or to a 300 ohm Windom.



4:1 BALANCED TO UNBALANCED

Figure 2: The 4:1 Balun

To protect the balun from the weather, enclose it in a box or apply protective coating as follows. After the wires have been cleaned, tinned and connected with soldered joints: dip the balun assembly into a container of Epoxy. This can be simply done by using an Epoxy Cement kit and mixing the contents in a foil lined ash tray or other container. Follow Epoxy Cement instructions for mixing. The balun can be coated or it can be encapsulated in a solid block. Such a solid block can be used as a dipole center strain insulator.

NOTES:

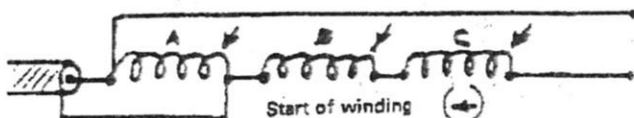
1. The voltage ratio is the same as the turns ratio.
2. The impedance ratio is the square of the turns ratio.
3. Voltage/Current relationships are somewhat altered to permit the use of smaller wire size in the Balun.

MATCHING TO A 36 OHM VERTICAL

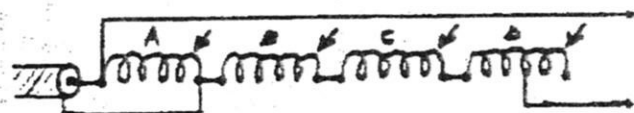
To match a 52 ohm (or other) coax to a 36 ohm vertical, make a Toroidal auto-transformer using the core and all of the wire. Connect one end of the winding to the inner conductor of the coax and the other end of the winding to the braid. Tap the winding for 36 ohms (or less) and feed the antenna from the tap and the braid. The formula is the same as for other transformer types. The impedance ratio is equal to the square of the turns ratio. If you tap the winding at the exact center, a 52 ohm coax will match 13 ohms. Example: $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ ($\frac{1}{4}$ of 52 ohms = 13 ohms.)

MATCHING TO 800 OHMS

WITH RG-11-U COAX (72 ohms). Make a trifilar wound balun of ten turns. When the windings are connected as shown below it becomes an auto-transformer with a 1 to 8 ratio ($9 \times 72 = 648$ ohms). (or 50 ohms to 450 ohms)



WITH RG-8-U COAX (52 ohms). Make a quadfil wound balun of ten turns. When the windings are connected as shown below it becomes an auto-transformer with a 1 to 16 ratio. By tapping back six turns on winding 'D' we can achieve a ratio of 1 to 11.6 ($11.6 \times 52 = 603$ ohms).



The builder is at liberty to experiment with the turns ratio in order to achieve the best SWR in cases where the exact load impedance is unknown.

SUGGESTIONS:

1. When working with higher than 4 to 1 ratio with kilowatt power, voltages become too high for Formvar wire. Teflon sleeving, OR a higher voltage rated wire, such as the new 'ML' wire is recommended. We have both.
2. Cut three or four lengths of wire (as needed) prior to winding.
3. Tape each end of the wires with masking tape, making sort of a 'multiwire ribbon.'
4. Clamp one end of the 'ribbon' in a vice and HAND wind.
5. DO NOT CLAMP THE CORE IN A VICE.
6. Insert the wire 'ribbon' through the window of the core and wind until you have completed ten turns.
7. Connect windings per above instructions.
8. The completed balun should be encapsulated for protection against moisture.