

[Back to Projects Page!](#)   [Home!](#)

## Homebrew A 4 To 1 Balun By N1HFX

Many modern HF transceivers come fully equipped with built in tuners. While these tuners are great for changing bands, the manufacturers left out a very important accessory; the 4 to 1 balun. With out a balun the transceiver can only feed an antenna which uses coaxial cable. While this may be satisfactory for some operators, this is a real problem for those of us who prefer the super low loss ladder line. The only other alternative is to buy an external tuner with a built-in balun which is really absurd after spending the additional money to have one built into the radio. Fortunately, a 4 to 1 balun can be easily home brewed as illustrated in Figures 1 and 2.

Figure 1 shows a bifilar winding on a toroid. The toroid should be type 2 (red) material and can be any of the following sizes but the number of bifilar turns should be adjusted accordingly:

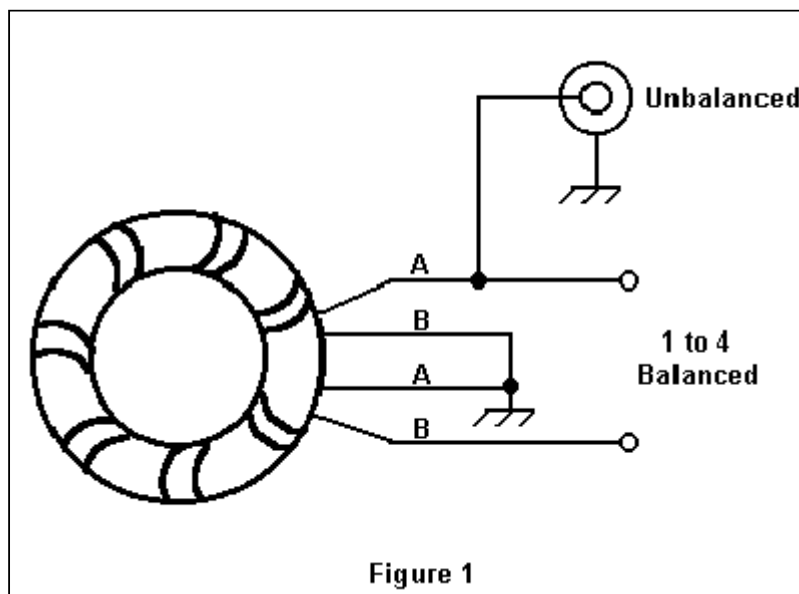
| TOROID  | NUMBER OF TURNS | POWER RATING |
|---------|-----------------|--------------|
| T80-2   | 25              | 60 Watts     |
| T106-2  | 16              | 100 Watts    |
| T130-2  | 18              | 150 Watts    |
| T157-2  | 16              | 250 Watts    |
| T200-2  | 17              | 400 Watts    |
| T200A-2 | 13              | 400 Watts    |
| T400-2  | 14              | 1000 Watts   |

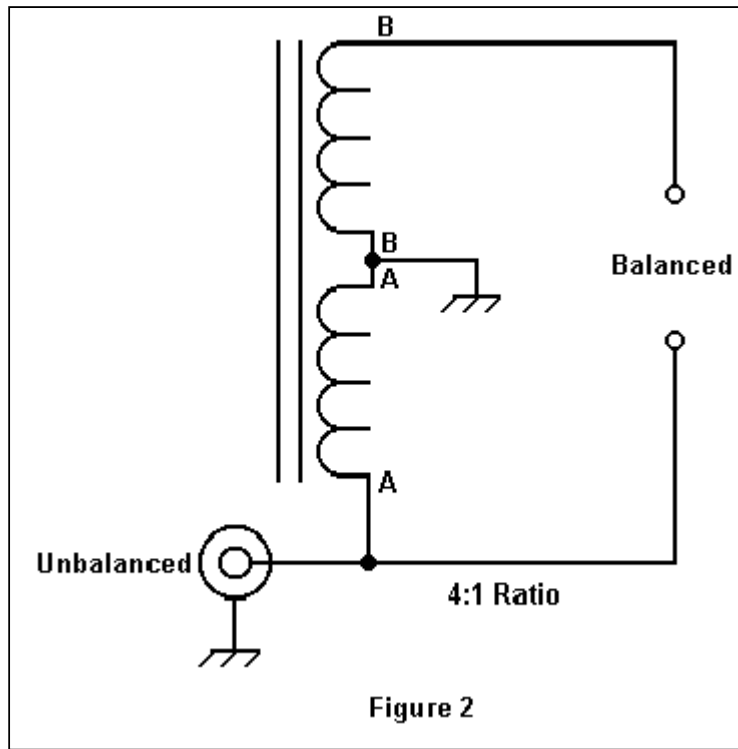
The exact number of turns is not critical but the numbers listed in the preceding table should yield optimum results. It is possible to exceed the power ratings listed above but the performance of the balun may be degraded during high SWR causing heating of the core.

Toroids of this type are available from Palomar Engineers, P.O. Box 462222, Escondido, CA 92046 (1-800-883-7020). If enough inquires are made, the author will make a limited number of toroids available at RASON meetings for those who hate mail order. The author will even wind the toroid for the faint of heart.

The balun should be housed in a suitable metal enclosure such as those available at Radio Shack. Use a SO239 or BNC connector for the unbalanced input. Nylon binding posts such as RS 274-662 work just fine for the balanced output.

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[Back to Projects Page!](#)   [Home!](#)