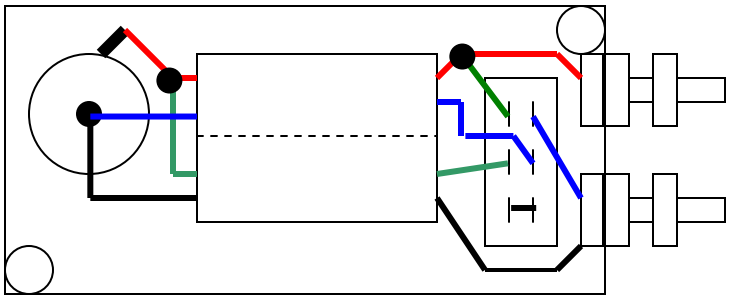
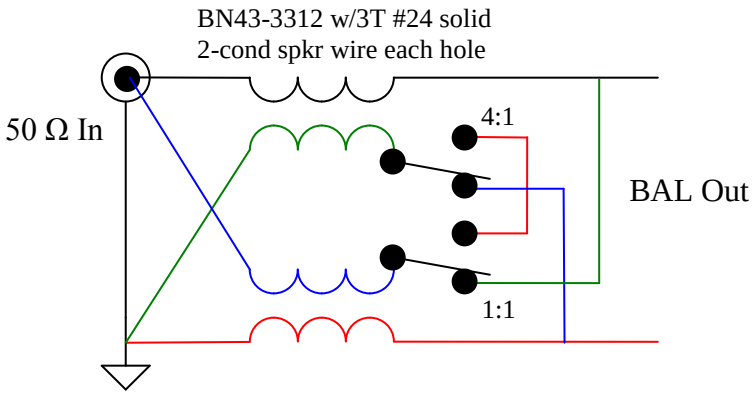
K5OOR Balun as built by AD5X
Phil Salas AD5X

Virgil K5OOR designed a broadband 4:1 and 1:1 balun based on a BN43-3312 binocular core (www.CWSbytemark.com B3312-43) used in the HF Packer Amp. These cores are just $2.25 each, and can handle a 100-watt transmitter. I built two baluns – one as a 4:1 balun only, and one switch-able as either a 4:1 or 1:1 balun. For each winding, Virgil used two pieces of 20 gauge Teflon coated wire, but I substituted 24 gauge 2-conductor solid speaker wire from Radio Shack.

Wind three turns (about 8" total length) of the 2-conductor speaker wire through each hole. I built the switch-able balun into a 2.38x1.38x0.8" plastic box (All Electronics 1551-HBK $1.20), and the 4:1-only balun was built into 1.97x1.38x0.8" box (All Electronics 1551-GBK). The switch is the All Electronics SSW-37. For an RF input connector, I used a single-hole SO-239 connector (Radio Works #409) to maximize the internal space. The balanced outputs are on #6 screws with thumb nuts. The wiring diagram and schematic for the switchable 1:1/4:1 balun are shown below. For the non-switchable units, just eliminate the switch and hard wire for either 1:1 or 4:1.

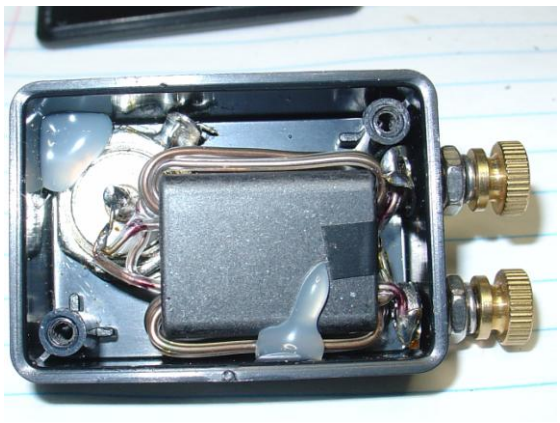


4:1/1:1 Balun Wiring Diagram



Schematic: 4:1 & 1:1 Switchable Balun

The photos below show the 1:4 hard wired, and switchable 1:1/4:1 balun insides respectively.



4:1 hard-wired balun

1:1/4:1 switchable balun

Measured performance is quite good. I connected the two baluns back-to-back in the 4:1 mode. Using my Array Solutions VNA2180, I measured a 1:1 VSWR from 1.8-25 MHz, a 1.1:1 VSWR at 29 MHz, and a 1.5:1 VSWR at 55 MHz. Insertion loss was measured at 0.26dB total, or 0.13 dB loss for each balun!

Back-to-back Measuring Set-up

Final baluns ready for use