

1:1 Homebrew Air Core Balun – SM2YER Goran

I made this 'Air Core' balun for use with a [single band portable 80M dipole](#). The manufacturing is quite simple and the result is a nice and very 'Heavy Duty' balun.

This type of balun is normally used with broad-band or multi-band wire antennas, - where gamma-match or other narrow-band matching is not suitable. The balun is also suitable for use with log-periodic or multi-band directional Yagi antennas.

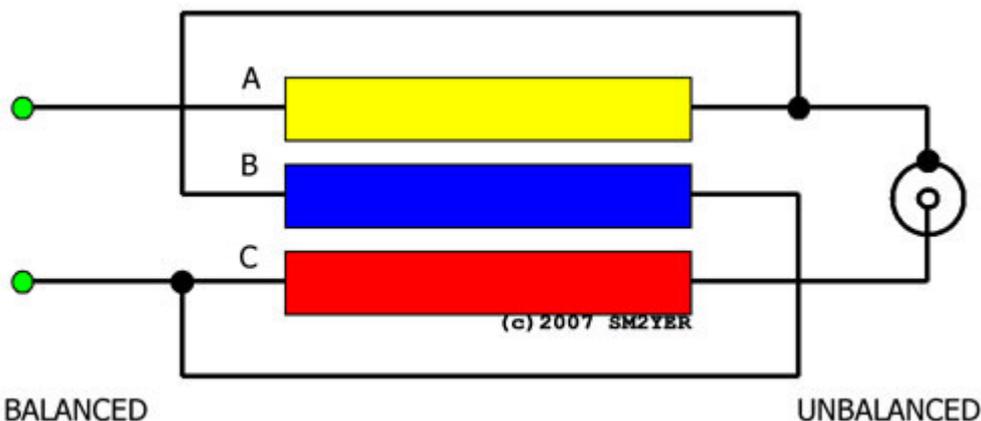


- Technical data - SPECIFICATIONS

=====

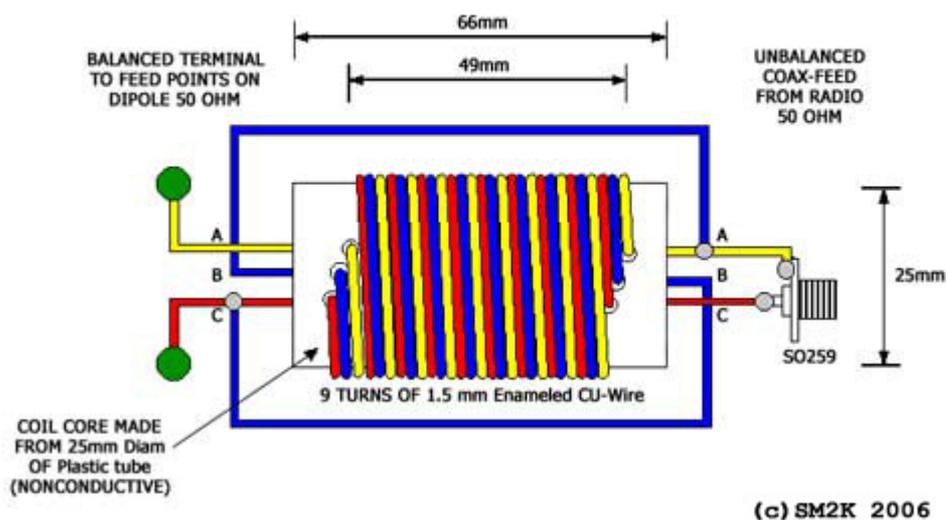
Frequency response ... 3-30 MHz
Maximum Input Power .. At least 1 KW
Input Impedance 50ohm unbalanced
Impedance ratio 1:1 (In/Out)
Dimensions
Weight

- Making the balun -



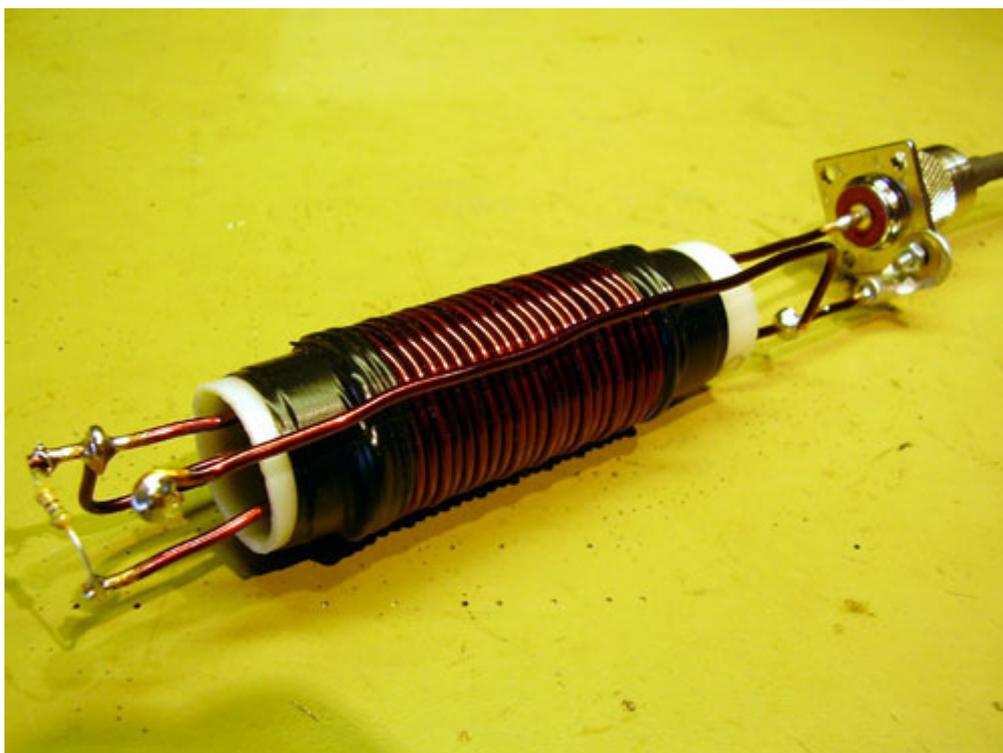
Principle - The coils on an air balun is not different from a Ferrite-balun, in the layout above you see the principle. Two coils (Yellow & red) is used as straight thru-feed, one for center conductor and the other for the shield conductor, they are

connected directly to each dipole half, The blue coil is used for reversed 'pick-up' and balances the dipole connections.



The Air-balun is made on a plastic 'No conducting' core,- Use a piece of plastic tubing about 25mm in diameter and about 66mm long. Drill three 2mm holes, - slightly in diagonal in one end, with about 5mm distance. drill three 2mm holes in the same manner in the other end of the tube,- distance between the two hole-rows is 49mm.

(On the images below i use 2mm Cu wire, the measurements given in this text is calculated using 1,5mm cu-wire)



Ready made coil and the test setup

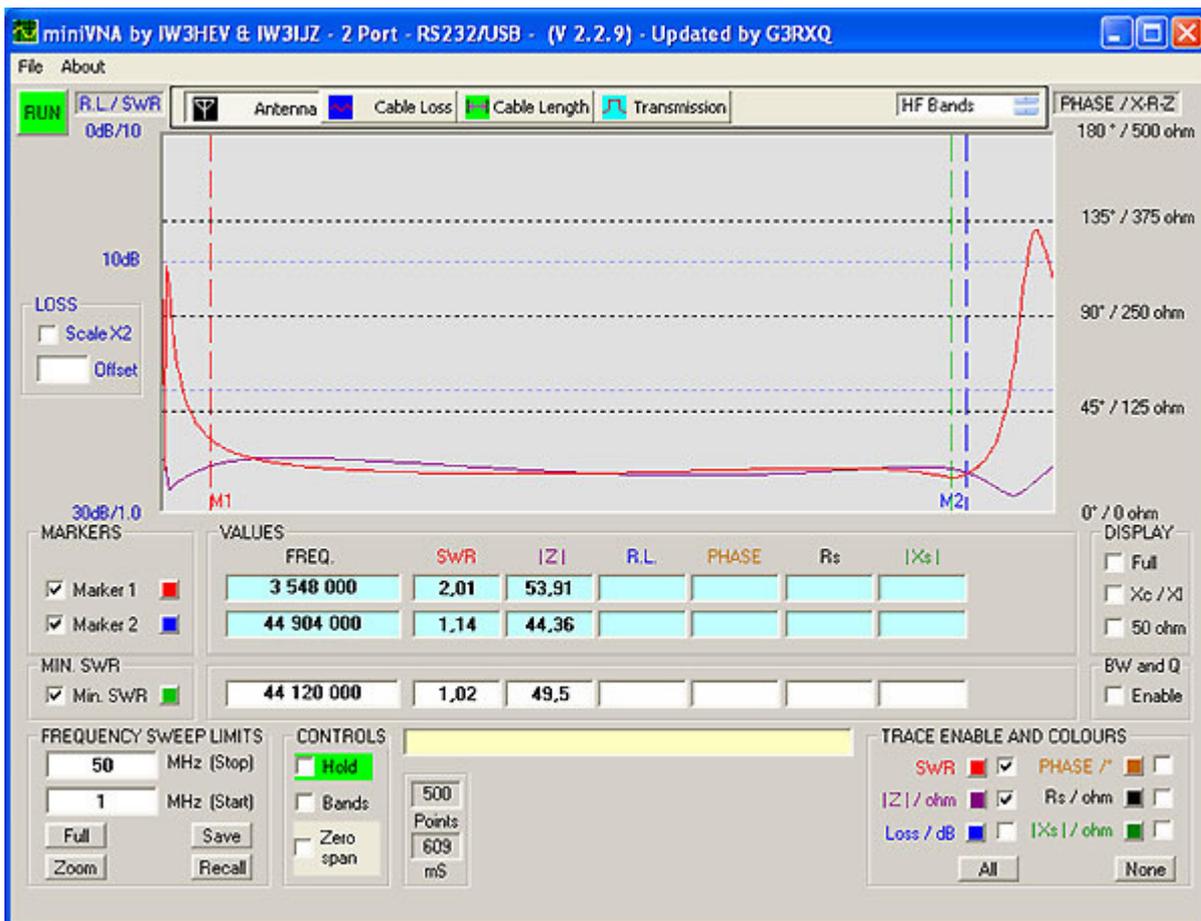
Hint! It is best to make one coil at the time, don't try to put all three on the core at once.

- Testing the balun -

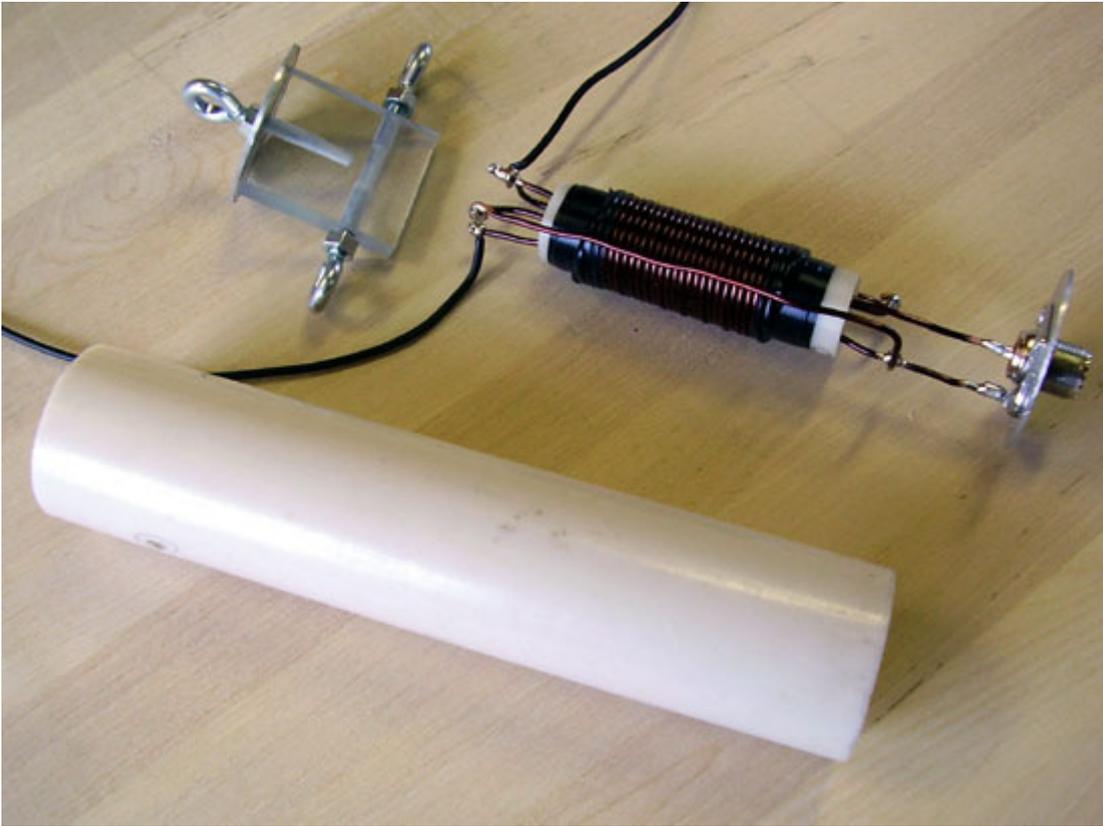
To this moment my only test is the frequency response shown here. I also need to make some loss/return loss measurements.



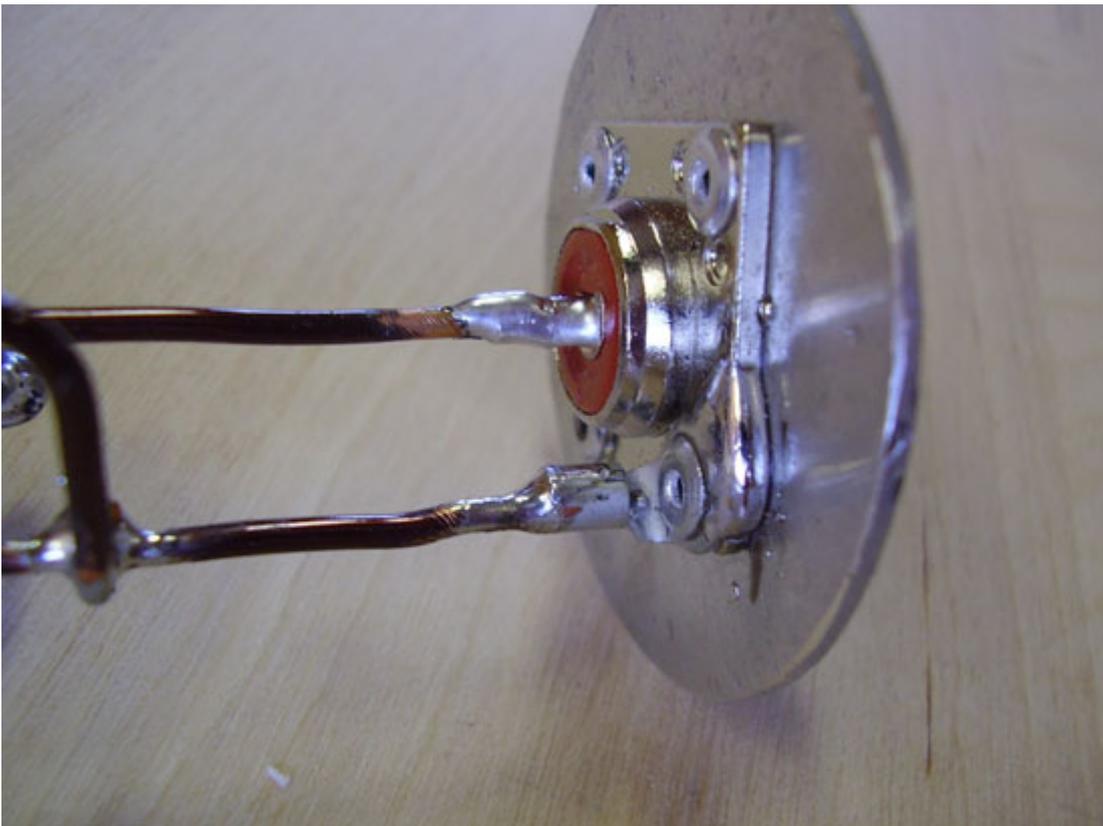
Test setup



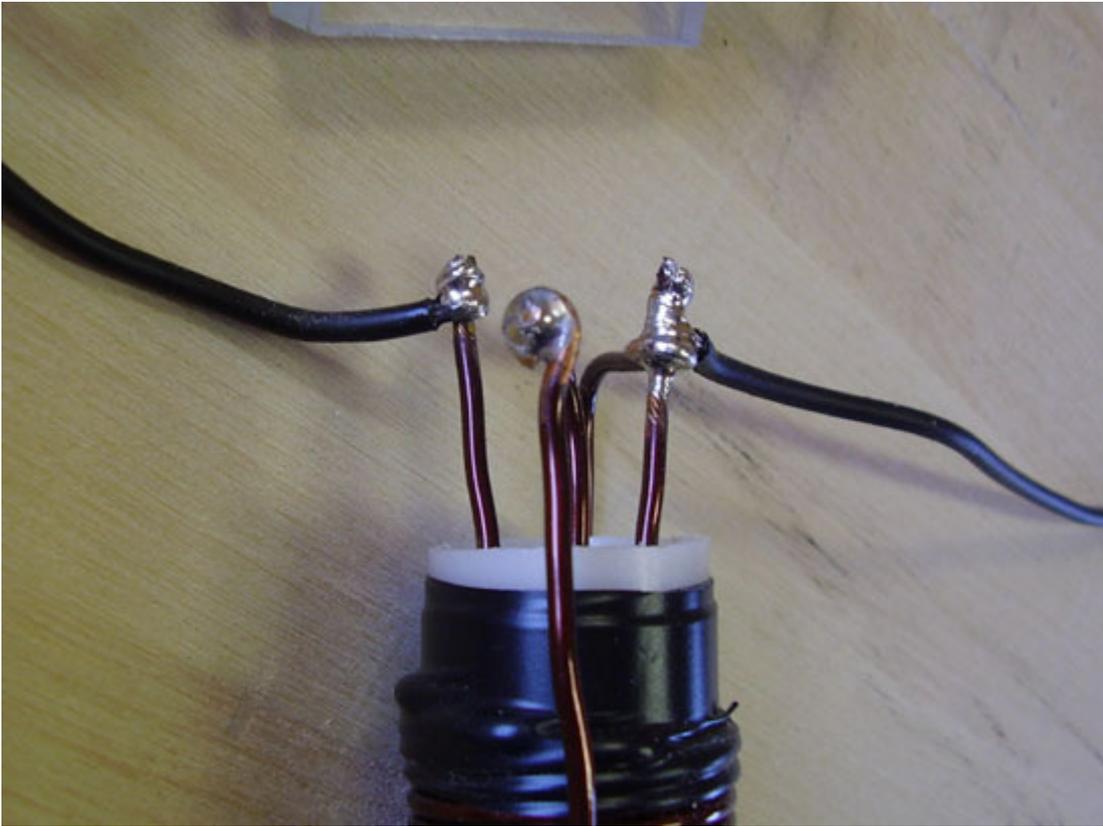
Frequency response using mini-vna



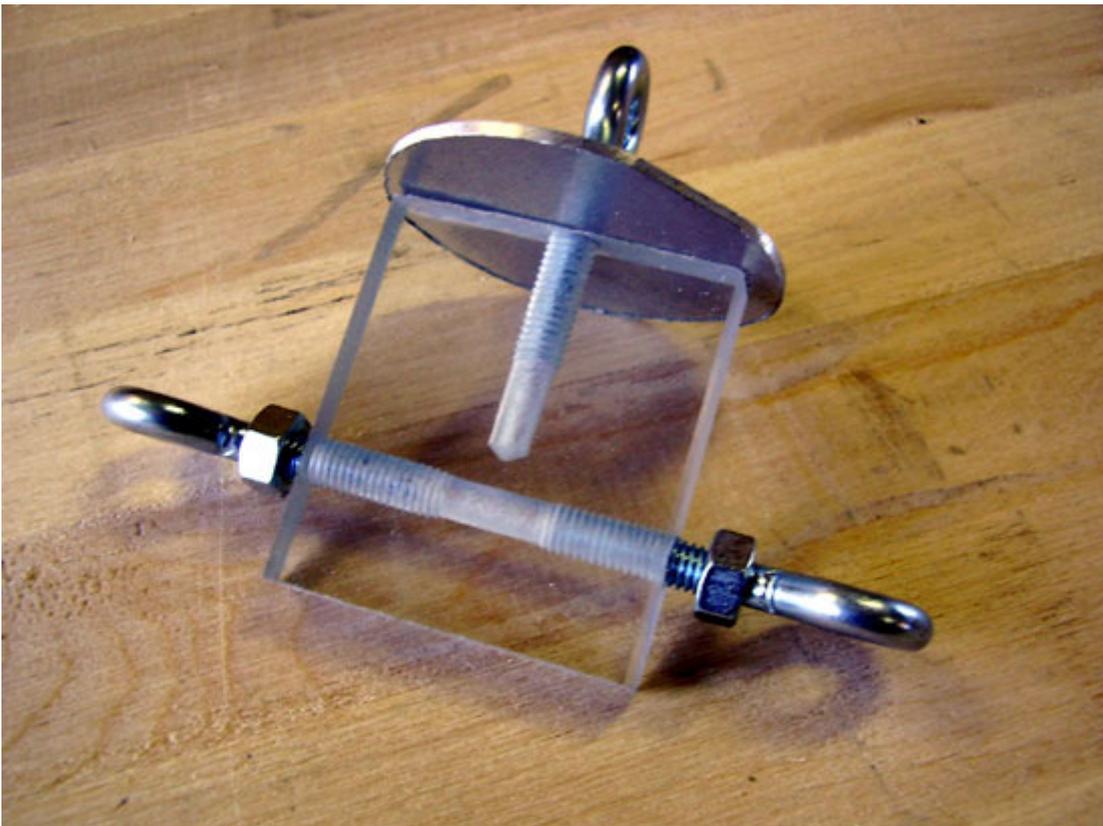
Parts before final assembly



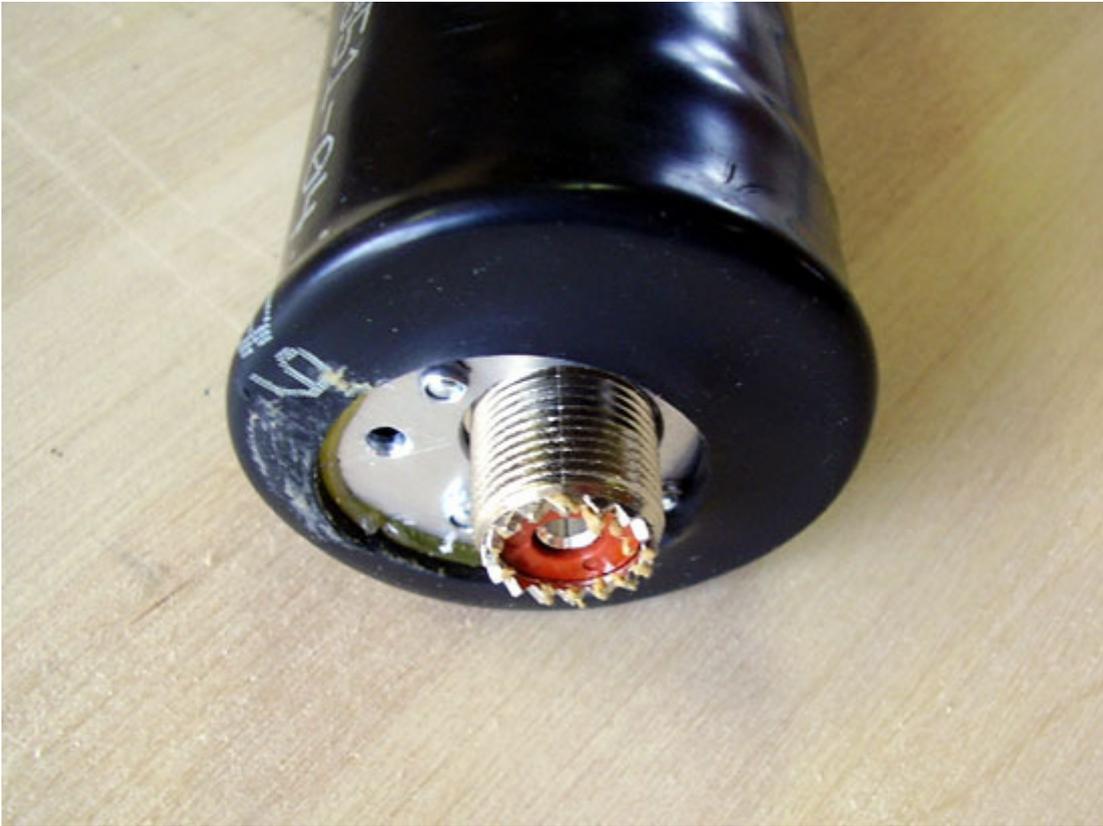
Inside of so-239 connector at balun bottom



Connection cable to balun core connections



Internal assembly for the antenna Wire attachment and hanger pulley



Drain hole at balun bottom



Antenna Wire attachment and connections