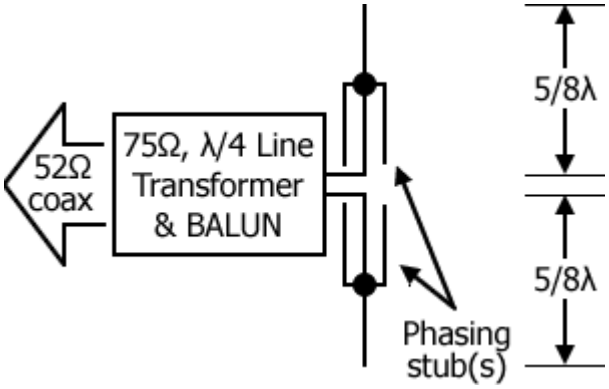
Double 5/8 Flower Pot Antenna

The Double 5/8 is a natural extension of the Single 5/8 and uses a 5/8λ element for both the top and bottom radiators.

The double 5/8 is a co-axially fed variation of the 1¼ wave (vertical) dipole shown in the adjacent diagram.

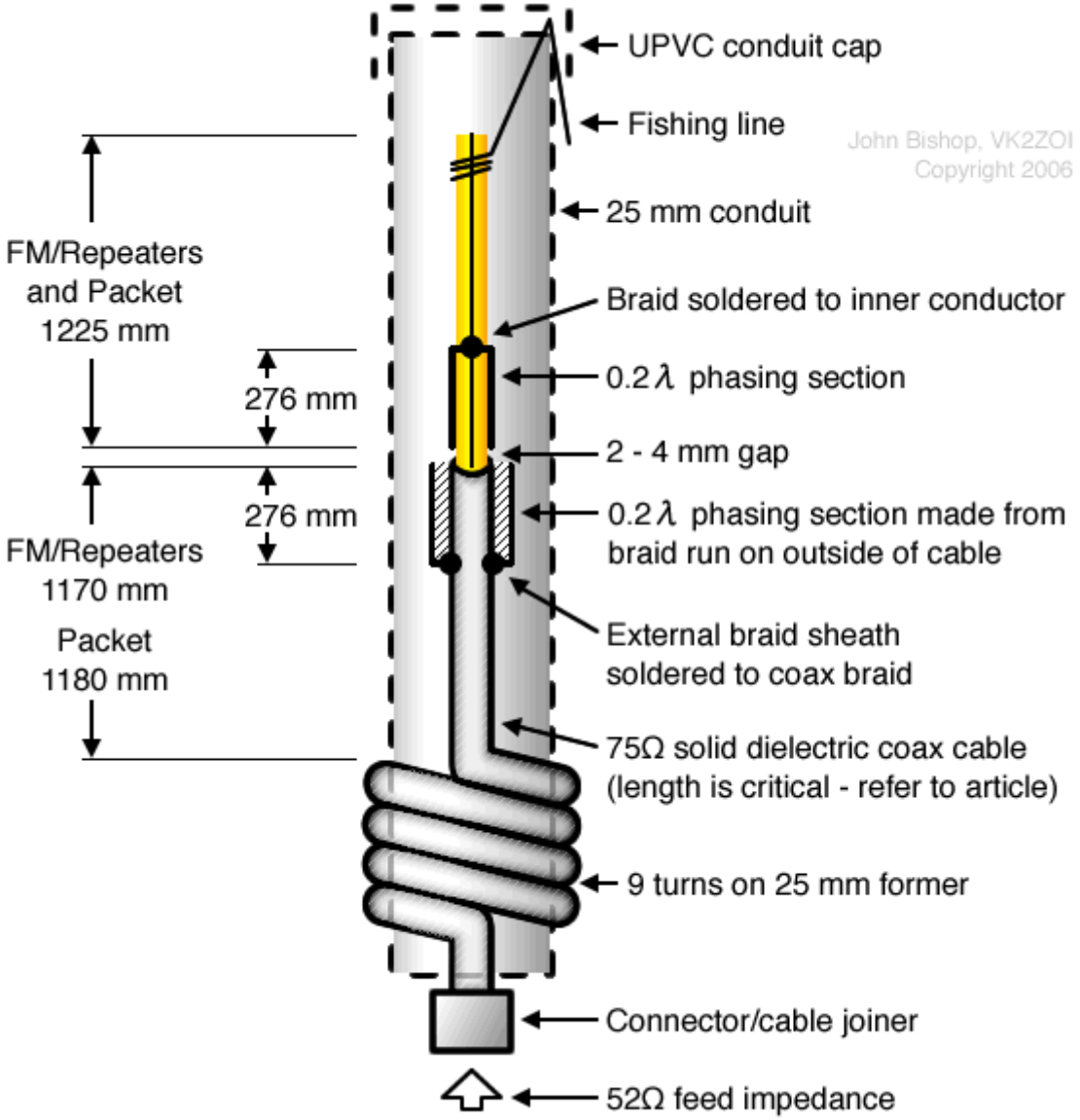


The double 5/8 is a co-axially fed variation of the 1¼ wave (vertical) dipole

This antenna should not be confused with an in-phase 5/8λ over 5/8λ collinear. If it was horizontal, made of wire and cut for HF, an old-timer might call it an extended double Zep. However, in addition to having gain over a half wave dipole, it has a predictable 100 Ohm feedpoint impedance which is transformed close to 52 Ohms by a 75 Ohm quarter wave line transformer. About half of the line transformer is formed into a choke to act as a current BALUN to allow co-axial cable feed.

2m Double 5/8

We fashion this antenna into the Flower Pot co-axial design by constructing the antenna using RG59 75 OHM (solid dielectric) cable and bringing the feed co-axially down through the bottom element as shown in the diagram below.



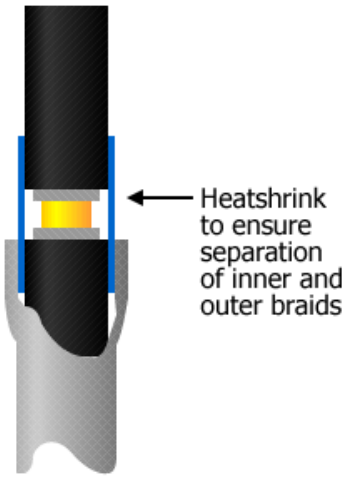
2m Double 5/8

The choke performs the dual role of providing isolation of the high impedance at the end of the bottom element and acting as a BALUN. Seven quarter waves of 75 Ohm cable are required for the bottom 5/8λ element and the coil winding. Seven 1/4 wavelengths of solid dielectric cable at 2m is 2.36m, to this add the 1.225m length needed for the top element to give a total length of 3.585m of 75 Ohm cable to construct a 2m antenna.

There are two ‘fiddly’ parts in making this antenna

The first is forming the 0.2λ section at the feed point of the bottom element. I ran a piece of braid on the outside of the cable sheath, carefully soldering this to the coax braid at the 0.2λ point and used heatshrink to hold it tight against the sheath. I assumed a velocity factor of 0.66 for this section. Care is needed when soldering to the coax braid (and this dictates the use of solid dielectric cable as foam or aircell dielectric will collapse away with the heat of soldering).

The second is ensuring that the braids don’t short at the feed point and I found a piece of heatshrink solved this. The sketch opposite also shows the detail at the radiator feedpoint and the piece of heatshrink acting as a separator.



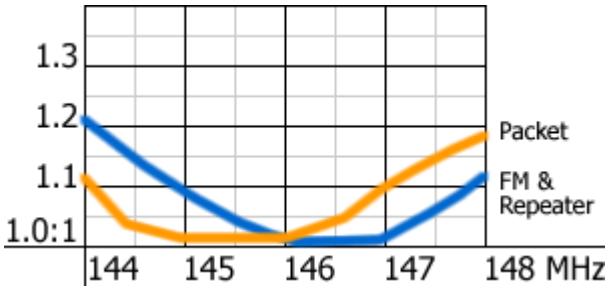
Piece of heatshrink acting as a separator at the radiator feedpoint

Otherwise, building the antenna uses the same techniques as used in the basic half wave and single 5/8 versions.

Bandwidth

The antenna provides a low VSWR (less than 1.2:1) across the 2m band. But, if you like operating close to 1:1, a small variation in the bottom radiator length gives favour to either the high or low end of the band.

The VSWR plots are shown below.



VSWR plot for the Double 5/8

Other frequencies

The Double 5/8 will scale to other frequencies, however the physical size and the mechanical properties of the conduit suggest that the design is more suited to the high VHF band.

Relative gain measurements between the designs

I do not have a means of accurately measuring antenna gain but set up each antenna with a switched attenuator in the feedline to a receiver. The attenuator was not ideal for this purpose, it had only 3,6 10 and 20 dB steps. However, using a local 2m beacon as a signal source and the basic l/2 Flower Pot as a reference and, within the limits of available accuracy and resolution of the steps of an S meter, I determined that the Single 5/8 had about 2dB gain over the l/2 antenna and the Double 5/8 was discernibly in excess of 3dBd gain (but, of course, much less than 6dBd).