WICEN (Vic) Inc

VK2ZOI Flower Pot Antennas for 6 & 2 metres

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Many vertically polarised, omni-directional VHF antennas for portable operation are less satisfactory than desired. Base station antennas often have radials (fragile, fiddly to assemble, and snag on objects – and people) and very often, the performance of a mobile whip mounted on a mast is disappointing and somewhat unpredictable.

A few desirable attributes for /P operation:

- lightweight and robust
- simple and fast to erect, no fiddly assembly
- cheap, readily obtainable components
- easy to construct
- easy to pack and transport
- no radials
- good performance (low SWR, good bandwidth, low angle of radiation)

Gain over a dipole is not on this list. An omni-directional gain antenna is only really useful over flat ground. In hilly country it will just exacerbate problems with multipath, which is much better controlled with a small beam. Even a small beam will have higher gain, too.

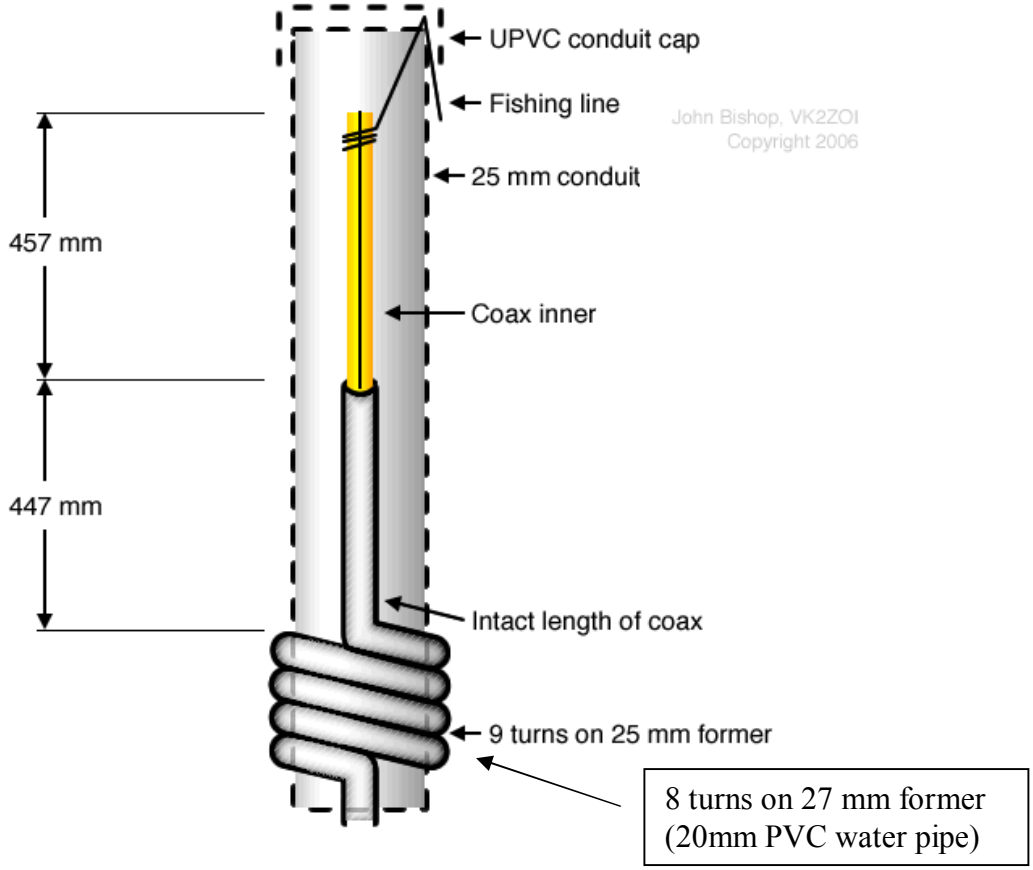
An antenna which fills all the requirements very well is the "flower pot" antenna described by John Bishop VK2ZOI. See http://vk2zoi.com/articles/half-wave-flower-pot/ See the article for how it got its name!

It is a centre fed vertical half wave dipole, with the feedline coming into the antenna coaxially via a resonant choke at the bottom of the antenna. Pat Hawker G3VA in his book Antenna Topics refers to the same design as an "end fed resonant feedline dipole", in reference to the resonant choke, although strictly speaking the antenna is actually a centre fed dipole. At HF the choke will have a resonating capacitor across it, but at VHF the flower pot uses self-resonant chokes.

VK2ZOI's design for the 2m version of the flower pot is shown on the next page.

Some minor changes to the antenna are needed to suit other available materials. The original uses PVC electrical conduit, you may prefer PVC pressure pipe which is somewhat different diameter. This required changes to the choke design as shown on the next page.

To improve appearance, use 20mm PVC waterpipe for the choke section, then a 20x15mm PVC reducer above the choke with the top section from 15mm PVC waterpipe. This improves appearance and makes the antenna lighter.



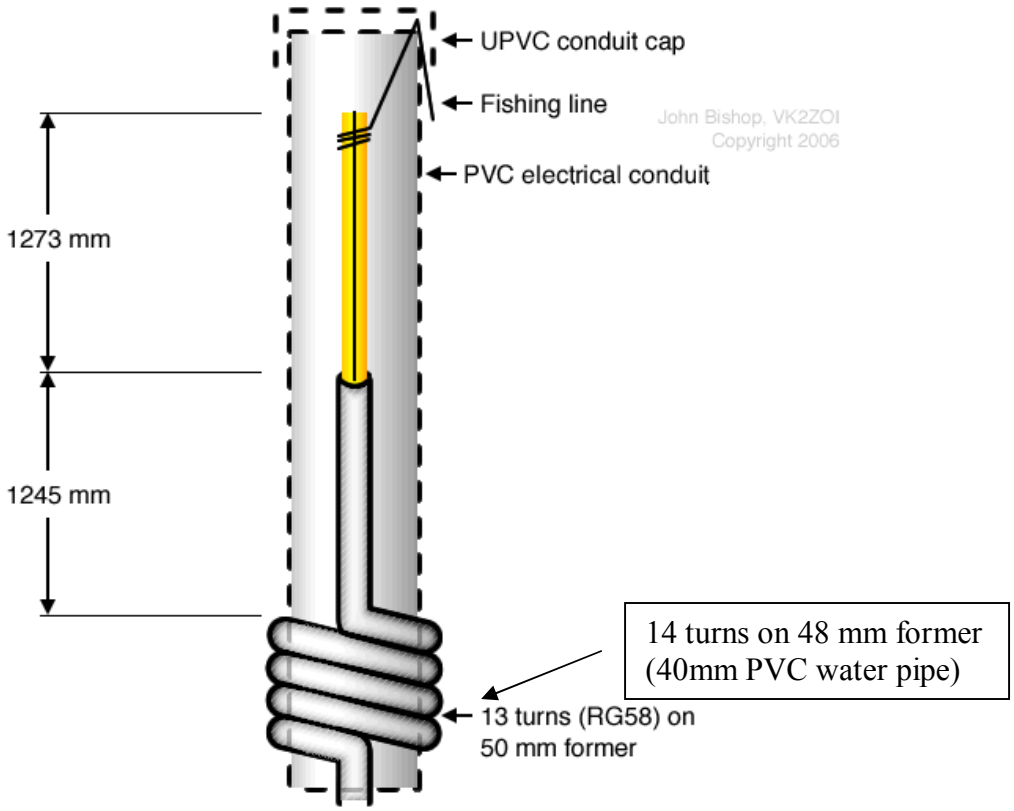
A version for 6m is also shown on the next page. Again, a modified choke is needed for water pipe instead of conduit.

To reduce the amount of coax used, the top section can be a piece of stranded wire of similar gauge to the coax inner conductor.

For portable use, a slimmer antenna is desirable. The antenna can be made from a combination of 25mm, 20mm, and 15mm PVC waterpipe with suitable reducers between each, and a section of 40mm waterpipe (which is 48mm OD) for the choke.

Another method is to shorten the PVC support pipe to just above the end of the coax shield, and mount a PVC pipe cap on the pipe. A stud from a standard VHF whip antenna mount (5/16 inch, 26 tpi) can be mounted through the cap and a stainless steel whip used for the top section. The whip can be removed when desired, making the antenna much more convenient to transport.

Yet another option is a “naked flower pot”. This just consists of the active parts of the antenna hung from a squid pole, with no PVC pipe except for a short piece for the choke former. The naked flower pot will probably require a “heavy duty” squid pole, a standard pole will probably bend too much. A naked flower pot needs the top radiator section to be 1300mm, somewhat longer than is required inside PVC pipe.



Performance of the flower pot is very good, and compares very well with good commercial antennas. It is worth noting that ZCG-Scalar marketed a very similar antenna many years ago; it also performs well.

The web page for the antenna also includes some SWR plots, which show the antenna is reasonably broadband.

Flower pots have been built by a number of WICEN members with uniformly good results.

Overall, this antenna design ticks a lot of the boxes for portable operation, and is well worth a try.