

# A Simple 160m Vertical Antenna

I cannot claim any originality for the design of this antenna nor am I certain from where the design originated, however I can confirm it is easy to build, and a great aerial in practise. For interest, I did not strictly adhere to the suggested design so a little 'flexibility' is quite in order. The basis of the antenna is a cheap 10 metre fibre glass fishing pole and a length of wire

## IN USE

When comparing this antenna with my 160m 1/2 wave doublet horizontal dipole which is at 50/60ft AGL, it has never failed to amaze me the difference in the two aerials when switching from one to the other and noting the difference, obviously it is the difference in polarity, refraction etc. so maybe a good idea to have the antenna available to work stations that you would not normally be able to work using your horizontal aerial.

Of course if you do not have the area to put up a large **horizontal** dipole for 160m this vertical is ideal and could be thought of as virtually 'unobtrusive'. It is also light enough to be easily erected, used, then removed and placed on your garage roof or other suitable location ready to use again.

In use it is amazing to hear long distance stations from the eastern block on the vertical and then switch to the horizontal only to barely hear them at all. However the reverse is also true and the horizontal wins over the vertical. I will not give a reason for this as I do not know sufficient about propagation, refraction and reflection etc, however now that I have both polarities I have less chance of missing a station. It is interesting that the first station I worked with the vertical on a TEST CQ was in the Ukraine at S5, however when I switched to the horizontal I could barely hear the station at all.

I think my consistent success in working **extremely** long distances on 160m is down to a combination of both the vertical **AND** an extremely large earth-mat that covers the entire garden area although I **will** add the garden is not large. I have heard the USA many times calling CQ but they have not heard me, is this the POWER thing?

## THE ANTENNA BUILD

To build this antenna needs the most basic of materials, I did buy the wire (15swg) however many of you will already have suitable wire in your bits box (gauge not over important). The wire I used I purchased from Brocott via eBay this being excellent quality and an excellent service. The fishing pole, a 10m glass fibre, again I bought via a seller on eBay and cost surprisingly little, I think it was £24.95 plus a few bob postage. The coil former was a length of standard 40mm PVC tube. It is interesting that reading different publications on the use of this basic pipe for coil formers that a few of the publications recommended the use of **WHITE** PVC. However I did not read this until I had finished the aerial though I did not find any problems whatsoever using **BLACK** PVC pipe. Apparently the black pipe is said to have a quantity of a metallic element in the plastic altering the characteristic when used as a coil former, I rest my case !

Clamping the antenna to a vertical aluminium pole could pose a problem as the wall of the roach pole is extremely thin and there is a danger of crushing. To overcome this difficulty it is recommended to insert a length of solid material, it basically could be wood although I have used a length of Delrin Rod, again purchased via eBay, thank goodness for eBay.

The worst thing to tackle is winding the former, but as long as the first turn is anchored (I used a glue gun) it is pretty straightforward and as the wire is reasonably thick if you lose count of the turns it is quite easy to re-count them, especially if you mark the turns (maybe every 20) with a felt tip pen. When the former turns are complete the last turn is again secured with the glue gun. The complete former then covered with a coat of varnish.

The joining of the wire from the bottom and top vertical lengths are secured to the coil using 10amp connectors stripped from a 10amp connector strip (chocolate block strip) a liberal application of solder finishes the joint which should remain electrically sound for many years.

My antenna is supported using Dacron cord, this is very thin, completely unobtrusive and immensely strong I think I remember it's 400lbs breaking strain, bought, would you believe, via eBay.

## TUNING THE ANTENNA

Using the lengths of the vertical as written I found the resonant frequency was approx 1.68Mhz however I quickly resonated it by cutting off approx 6" lengths until it resonated on my chosen frequency 1.885Mhz as my interest is in that portion of the band and long distance operating (DX).

It will be found that unfortunately the aerial has a **very** narrow window 'bandwidth' therefore, if you are interested in using the aerial for different parts of the 160m band it should be used with a good antenna tuner unit (ATU). I did experiment with matching the antenna to 50ohms and a picture of the matching coil is included with this article for anybody interested in 'having a bash' and see if they can get it to work better than I did. I have also shown details of an 'opposed' polarity wired and switched coil for experimentation. The idea of this coil was to add or reduce inductance by clicking the yaxley switch which was wired to short turns thereby adding or removing inductance increasing or decreasing the resonant frequency, again I gave it up as a bad job. Of course if anybody has a go at using this idea with success I would welcome hearing from you.

There is no matching of the aerial whatsoever provided, a bit crude for my liking, however it did not seem to deter from the result and of course has simplified the design no end, an important thing to do however is to make sure the outer of the coax is directly grounded at the base of the antenna.

If you 'have a go' please, **let me know how you get on. THANK YOU.....**

**If you arrived on this page via a search engine the full details i.e. materials, dimensions, build etc. can be found at the main website address:**

<http://petlyn.co.uk/vertical/index.html>

Peter G8CVF Wirral September 2009