BUILDING THE DOUBLE SIZE G5RV ANTENNA

AN ARTICLE BY 2E0DBD

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PARTS LIST

70 Metres of 16 gauge PVC coated stranded wire. [to make top section]
Source: Find a scrap dealer. [Expect to pay around £5]

Plastic for centre insulator and end insulators. [check it in a microwave for RF properties]
Source: Find a sign-writing company [Perspex]

Stainless or Brass 6mm Nuts, Bolts, and washers x 2
Source: Hardware shop

21 metres of 300Ohm slotted ribbon feeder [to make matching section]
OR make your own open wire section.
Source: Henry Westlake

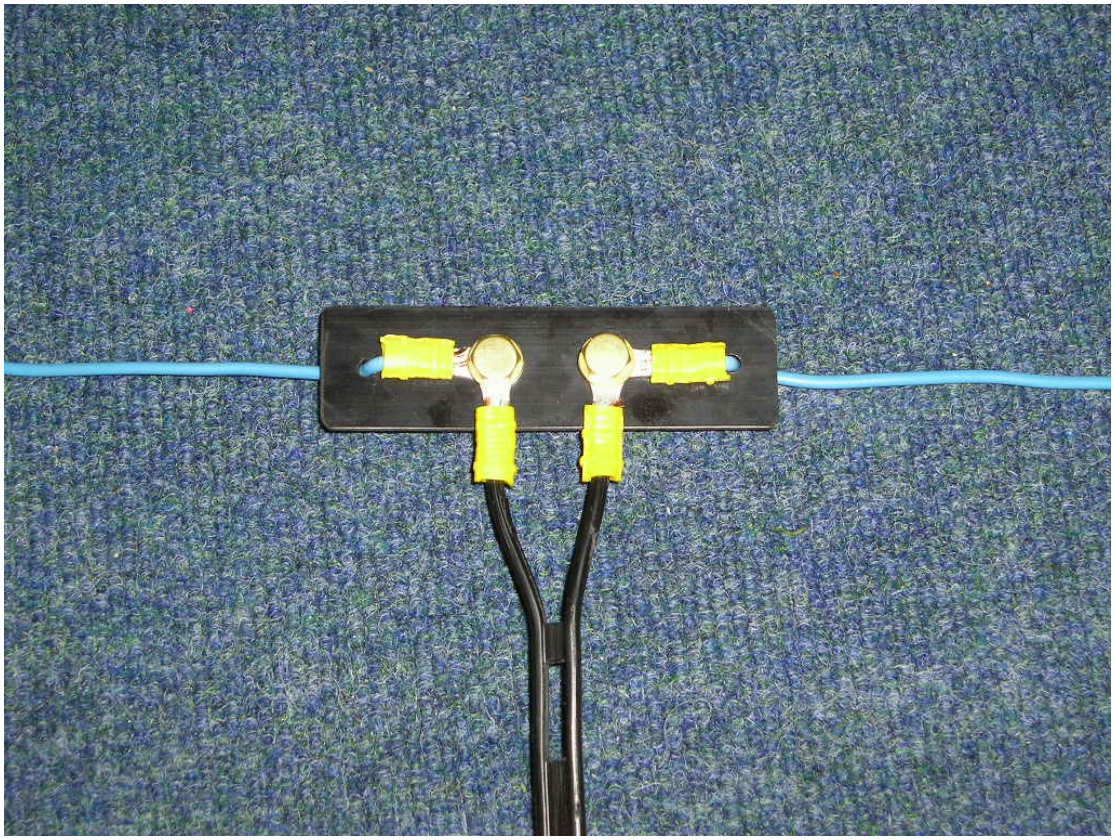
Plastic washing line [to make antenna supports]
Source: Hardware shop

ASSEMBLY OF PARTS

Top section assembly

I started by cutting 2 lengths of wire each 31.05 Metres [102 feet] long.
You may wish to add 10cm or so to allow for tuning [not very noticeable on 80M but noticeable on 10M]

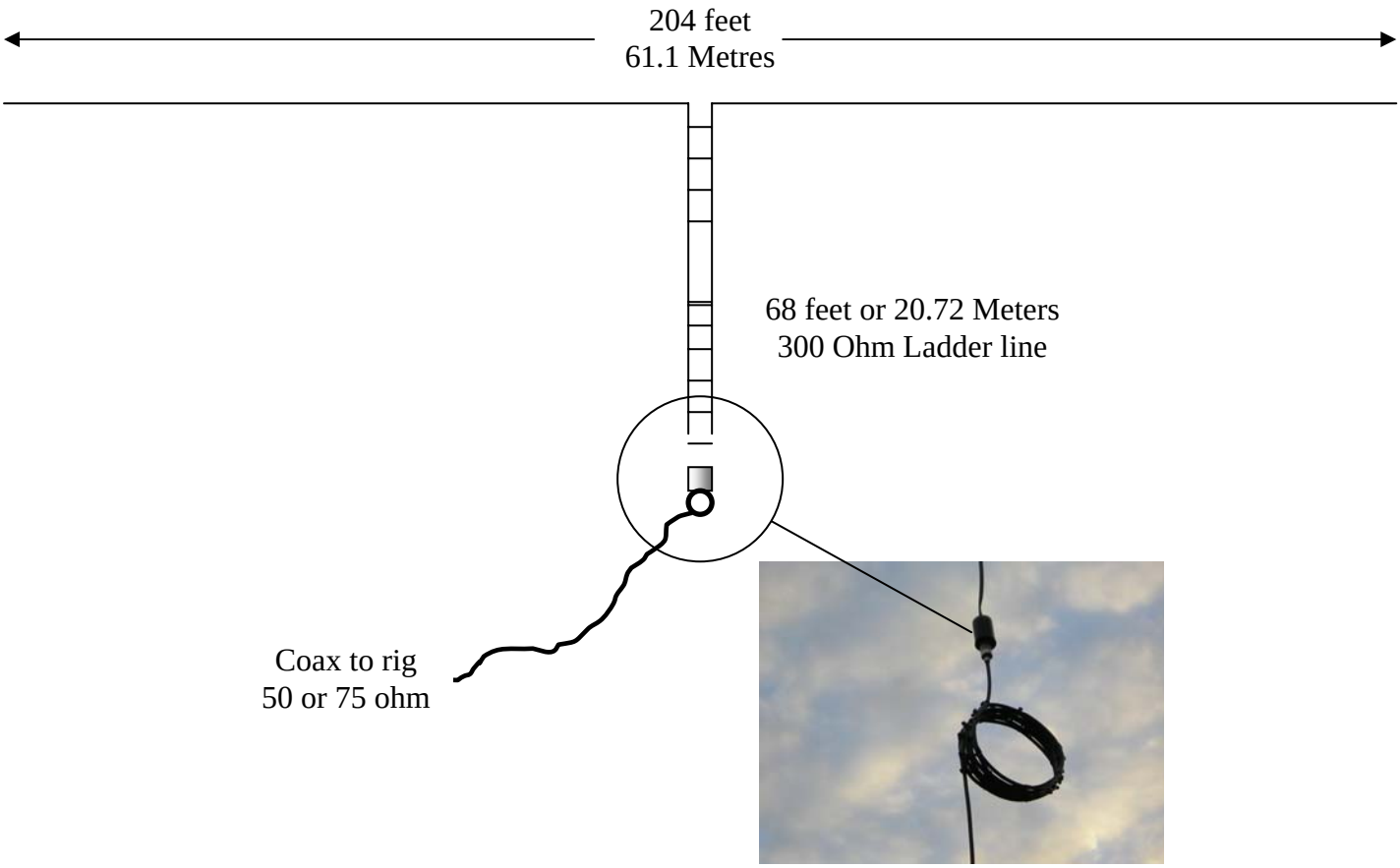
Centre insulator assembly



You will see from the above picture the assembly of the top section [blue wire]
Each 31.05 M [102 Feet] length of blue wire is terminated with a 6MM Yellow crimp. Make sure it is soldered as well as crimped on **AFTER** you have passed it through the centre insulator. The purists amongst you will undoubtedly have noticed a slight design flaw in that the wire passes through the insulator and may be a weak point in the wind as the antenna sways around.
This is not an issue if you plan to "hang" the antenna from some blue nylon rope or similar.
If you plan to "Pull up" the antenna from the ends, you may wish to add some kind of strain relief to the wires. This can be in the form of a loop, which passes over the top of the insulator, and down the back of it, and then the far end of the wire is passed through the loop.

The ladder section 21.72 Metres [71.3 Feet] is assembled in the same fashion. Strain relief in the form of a cable tie is passed under one of the "slots" in the ladder section

Dimensions of double size G5RV



8 – 10 turns of coaxial cable about 6” diameter. Plugs into SO239 socket fitted in 35mm film canister.

The purists amongst you will probably scowl at the mere mention of coaxial cable feeding a G5RV, however, at the time James M1DST and I made this antenna, I did not possess a balanced ATU. So we used the RG58 as a means of getting on the air. Now that I possess a balanced tuner, I will almost certainly run the ladder line straight to the open wire balanced terminals.

You will see from the diagram, and the photograph above, that I made a “Choke Balun” from RG58 cable consisting of 8 – 10 turns approximately 6” in diameter. This I am reliably informed helps reduce current flow on the outside of the cable.

Using the double size G5RV

The antenna had been installed on a Mobile Tower with a 21-foot aluminium scaffolding pole in the top. Attached to this 21 foot pole was a gibbet assembly with a pulley on it. The idea was to make a halyard system for ease of installation.
The ends of the antenna were suspended up in the top of nearby trees.
To get the rope into the trees, I threw a light duty bracket tied to the thin support rope over the highest point possible [takes a few tries!!] The average adult should be able to make 30 or so feet without too much difficulty. I, after several **miserable** attempts, made 45 feet at either end, and the antenna was raised with the help of M3IIY [Gareth] M3GSF [Trevor] and 2E0GYZ [Will]
I plugged the antenna into the Radio and hit the tune button on an empty frequency on 40M. With a couple of whirrs from the auto-tuner, the radio showed 1.2:1. My previous full sized G5RV was perfect on 20M, and my line of thought was that this one shouldn't be too far out on 40M!!
I know a few will be horrified that I did not check the VSWR first on an analyser, but I had tried it previously and it seemed excellent on 7.060 so I thought I would just hit the tune button and note my results.
Now the auto-tuner in my particular radio will tune a VSWR of 3:1 or better, and so as I was able to tune on **ALL** bands including 160M, I assumed that it was not too far out on each band.
We had installed a Butternut 9 band vertical at ground level to give a secondary report to stations we worked. It must be noted here that the Butternut was installed at ground level, and not on top of the tower.

On 80 Metres, the double size G5RV worked superbly. It was on average 1 –2 s points up on the Butternut, sometimes as much as 5 s points up. People were very complimentary about the antenna performance on 80 M and our contacts included MM0XAU in the Shetland Islands, LA3HFA in Oslo, and DJ4ZF in Germany.

On 40 Metres, once again the double size G5RV worked very well, although it was only up one s point on the Butternut.

On 20 Metres, we were surprised that the Butternut outperformed the double size G5RV by an average of 2 s points.

On 17 Metres, we heard Trinidad and Tobago at 23.00 hours 5/9 although we were unable to break through the pileup. The double size G5RV was up 3 s points on the Butternut on this band.

On 10 Metres, we worked some Italian stations 5/9++ and some Spanish stations 5/9++. The butternut again came in second [but only just!!]

Even with Gareth and Trevor only using 10 watts, we had some super contacts. We were 5/9++ all over UK and some 5/9 into Europe.
With 50 watts however, there were comments made about how strong we were [some not so complimentary!!] G3RFX from Bristol was full of praise about our station, his audio has to be heard, and it is outstanding!! He reads the news on 80 M
We were Using a Yaesu FT1000MP MK 5 Field, an MD200A8X microphone, and anything between 5,and 50 watts of power [depending on who was operating and observing the power limitations of our license]
I hope to take the advanced exam at some stage and look forward to hearing the comments with more power applied to the antenna!!

Summary and acknowledgements

I would like to emphasise that the original antenna designed by the legendary Louis Varney worked extremely well, and the idea to make a double sized version was **not** a direct attempt to better it!!
I saw an article about the double sized G5RV on the internet, and having noted the size, realised it would fit superbly between two enormous trees on our testing site.
I know the experienced among you may think that feeding the antenna with coaxial cable is wrong, however as I previously said, at the time we made it, I did not have a balanced tuner. Now I have, I will almost certainly run 72 ohm twin wire right into it.
It performed superbly and astounded us all, not only did it tune on all bands, but also it received well on all bands. The bulk of our QSO's were on 80M, at which point I will say we worked 48 Counties in some 29 hours operating time **ALL ON 80!**
I can only say, if you have the space, try out the double size G5RV antenna for yourself. Be prepared though for the odd criticism as you tell others what you are using, and make sure you have a few empty pages in the log, as you will soon fill them up!!
At the end of the three days we spent testing and comparing the double size G5RV, we realised how simple and yet how effective wire antennae can be when installed at a good height. It was fairly simple and cheap to make, and provided us all with three full days of radio entertainment.

At this point I would like to thank the following people, without whom this project would not have been possible.

Mr Louis Varney G5RV [Designer of superb original antenna]
A. [Landowner]
M1DST [for helping make the antenna]
M3GSF [Testing/Security manager!]
M3IIY [Testing /Risk assessment!!]
2E0GYZ [Testing]
M0XUK [Web hosting this article]
My Wife Nicky [VERY understanding XYL!! /Waste disposal supervisor!!]