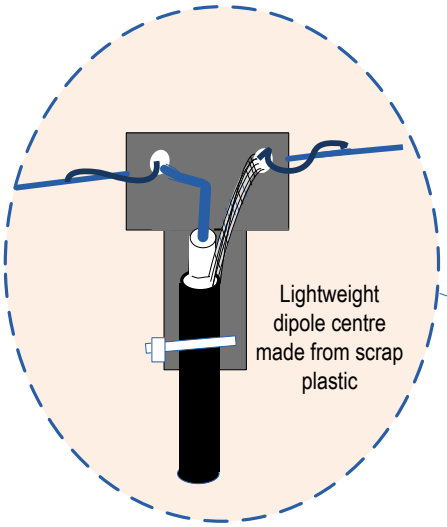
# "SAFARI" INVERTED Vee ANTENNA - G3RWF




For clarity only one set of links has been shown i.e. this is two band antenna. Extra pairs of links will be required for each additional band the antenna is intended to used. Each leg of the dipole is cut using the formula

L = (234/F MHz) x 0.95.

The 5% reduction is necessary to correct the impedance of the antenna for matching to 50 ohms.

Angle must be > 120 degrees

Band Changing Links
1" plastic curtain rings &
miniature karabiner clips

Top thin section replaced with a sturdier rod section
Pole then happily supports RG8U coax 25 feet without bending.

Plastic coated 1.0 -1.5mm multi-strand wire

Plastic tie wrap

To Tent pegs

Red plastic covered car cable connectors
See photos

3 Guys made from strong nylon or polypropylene builders string

Taped over joints to stop pole collapsing in winds

To Tent pegs

29ft fibreglass fishing pole 4ft when collapsed and weighs under 2kg

RG 8U
50 Ohm Coax

To Transceiver

Notes:

Using the insulators are 1" ( 25mm) plastic curtain rings and the miniature karabiner clips, enables the antenna sections to be disconnected just by pulling on a spring catch. This is used to detach the wire for 7.0MHz and 3.5MHz to make the antenna even lighter for the higher bands. A 1:1 balun was not used with this antenna design, and no RF feedback were experienced, but one can be used if required. It is very easy to adjust wire lengths to get a low SWR on all the bands. Some very simple lightweight guys about 9ft up the pole ensured it could be free standing. Accurate cutting for frequencies above 10MHz will provide a good match, while for 7MHz and 3.5MHz two different lengths of wire will be required to ensure a good match on both CW and SSB sectors.

Graphic Design - G8ODE 17 Feb 2009 iss 1

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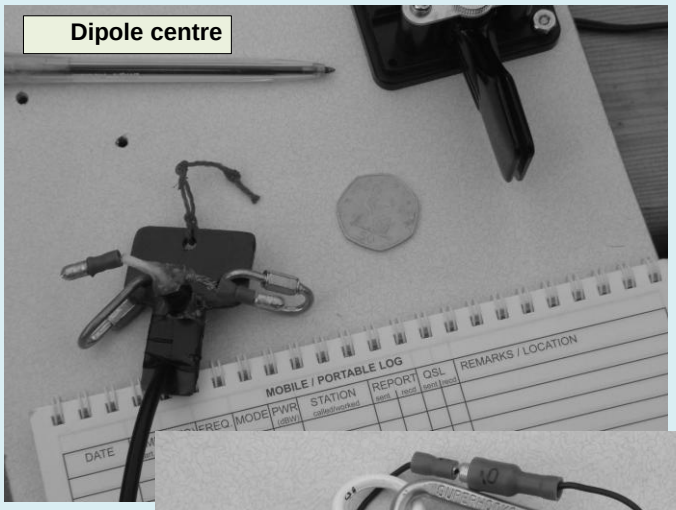
I found that I could easily raise the antenna on my own because it is so light. A halyard would put too much weight on the top and so to change bands you just take the whole pole down. On 10MHz and below, it is possible to reach the clips without dropping the antenna.

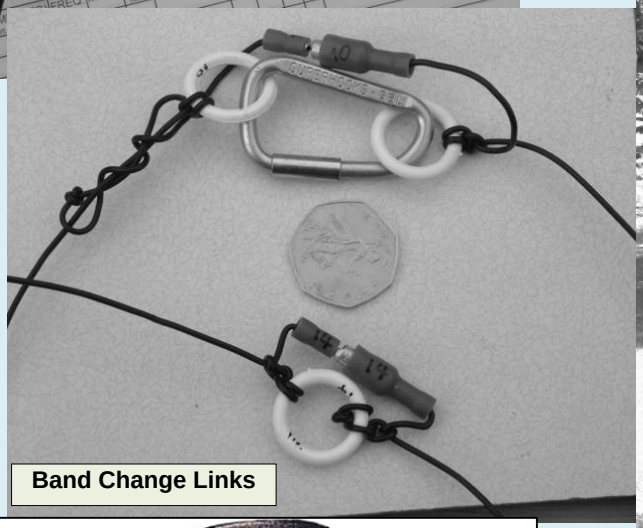
Final test ..with done with a £30 day trip to France, with the aim of setting up shop for RSARS members on Cap Blanc Nez (CBN). This proved the antenna design, and it even operated on the 80m net in the evening with a relatively low height (25ft).

I am very positive about my new antenna support and plan to take it with me abroad in future so I am free from reliance on trees. My new dipole is certainly light but I have yet to discover whether it is sufficiently robust – recalling Army advice years ago about not soldering antennas because they snap – a reef knot is better.

Nick Henwood G3RWF



Dipole centre


Band Change Links

FT-857

# "SAFARI" INVERTED Vee ANTENNA - G3RWF

Text summarised from Mercury No.142 article

## "Can you hear me Mother?" : a portable dipole for all seasons.

The "Inverted Vee dipole" strung up a tree has since been to Portugal, Namibia, South Africa, and Guernsey and twice to Cyprus. It has worked well but has always been dependent on the availability of a useful tree. So the challenge was to produce a lightweight mast which can be taken by air.

The "roach pole" – a fibreglass fishing pole is 29ft in length and collapses to less than 4ft. and weighs under 2kg and is increasingly used by UK portable operators. The inverted vee dipole does not need an earth system or an ATU. I generally dislike ATUs because they are used to match compromise antennas; tend to waste RF and require earth systems which are difficult to install when portable – hence the inverted vee. An important exception is the use of a vertical antenna immediately over water and

The little task that I set myself was to produce a dipole so light that it could be supported on a roach pole but fed directly with 50ohm low loss coax, thus providing a good match to my FT857's 100W without an ATU.

For the new antenna uses lightweight 50ohm coax, but even with short lengths losses can be significant. So RG8U cable was tried, but it bent over like the fishing rod with the coax was taped right up to the thinnest section. However, by not using the very whippy top section, the pole happily supported RG8U at 25 feet without bending. The friction-fit sections also needed taping when erected to prevent the chance of the pole collapsing into itself.

The dipole design is simply a multi-band dipole with insulators and links to adjust it for individual bands. To reduce weight car cable connectors are used, being simple and light. Insulators are one inch plastic curtain rings and some miniature karabiner clips, which mean that sections can be disconnected just by pulling on a spring catch, and are used to detach the wire for 7 and 3.5MHz to make the antenna even lighter for the higher bands.

The dipole centre piece is made from a small piece of lightweight discarded rainwater pipe with the coax hard-wired. Purists say that a balun is needed, but it was used without one, with no RF feedback problems being experienced after adjusting wire lengths to get a low SWR,.

Tests confirmed that the pole was strong enough to take the weight imposed at its highest point, and it would stay in the air vertically provided that the ends were not pulled too tight. Some very simple lightweight guys about 9ft up the pole ensured it could be free standing. The antenna is set up with an angle greater than 120 degrees at the apex (to get the impedance match about right).

It is a simple matter of making some adjustments to ensure the best match on each band. I determined the antenna length by using usual dipole formula less 5% (because of the inverted Vee configuration). Accurate cutting for frequencies above 10MHz provided a good match almost immediately. Below that frequency some adjustment in length was needed (usually further shortening) 7 MHz and 3.5MHz really need two different lengths to ensure a good match on both CW and SSB sectors and I left plenty of spare wire connected for adjustment.

The Final test culminated with a £30 day trip to France, with the aim of getting contacts with other RSARS members on Cap Blanc Nez (CBN). I found that the antenna worked excellently. The relatively low height (25ft) more than compensated by the good location I was able to secure because I did not have to rely on finding a tree. I am very positive about my new antenna support and plan to take it with me abroad in future so I am free from reliance on trees. My new dipole is certainly light but I have yet to discover whether it is sufficiently robust

– recalling Army advice years ago about not soldering antennas because they snap – a reef knot is better.

NICK HENWOOD G3RWF

A Useful Web link for designing the inverted vee is provided here

http://www.k7mem.150m.com/Electronic_Notebook/antennas/inverted_vee.html#Page_Top

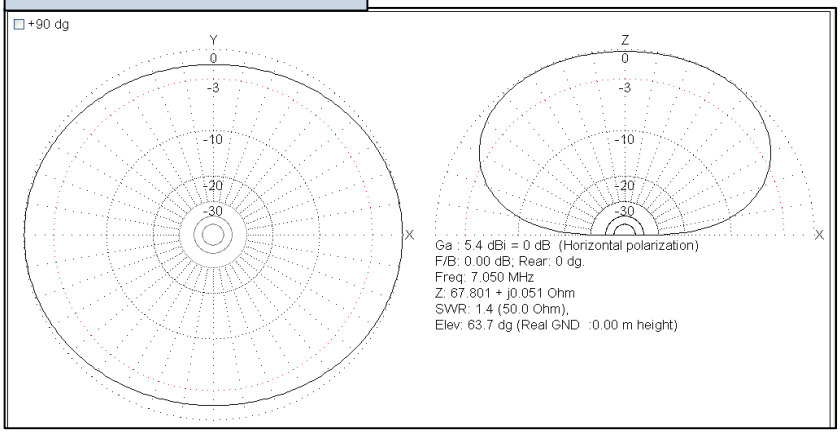
Sample values from the program shown below

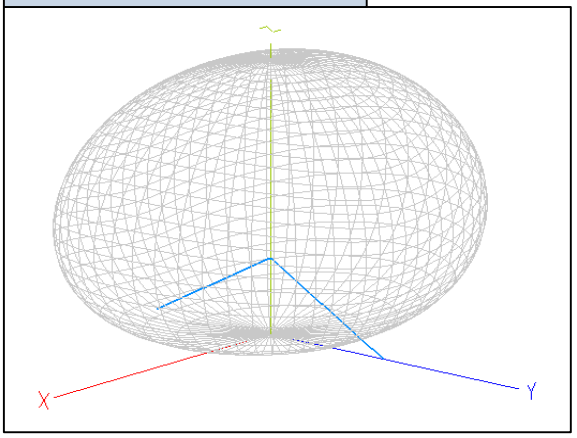
| Inverted Vee Dipole dimensions - 10m mast & Antenna Apex Angle 120 degrees | | | | | | | |
|---|---|---|---|---|---|---|---|
| MHz | 7.05 | 10.12 | 14.05 | 14.2 | 18.12 | 21.2 | 24.9 |
| One side of the dipole (feet) | 31.5 | 22 | 15.8 | 15.7 | 12.3 | 10.5 | 8.9 |

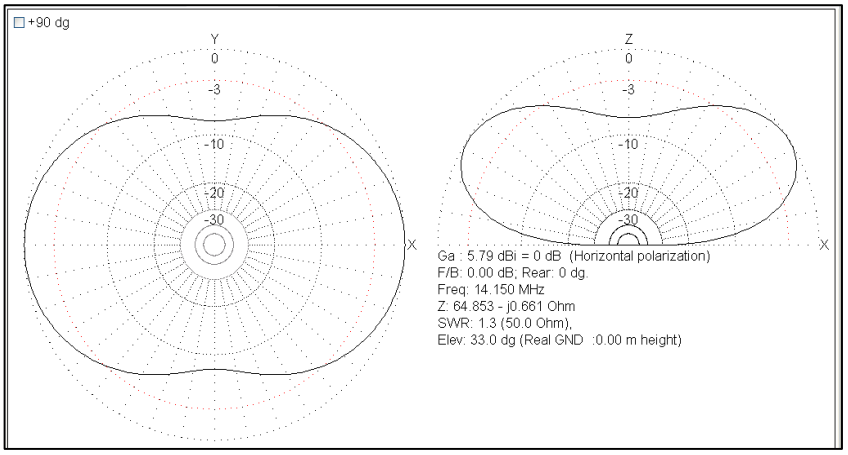
# “SAFARI” INVERTED Vee ANTENNA - G3RWF

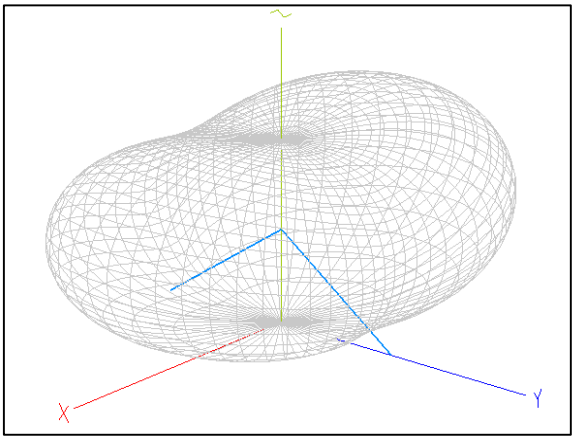
## Far Field Total Radiation Patterns

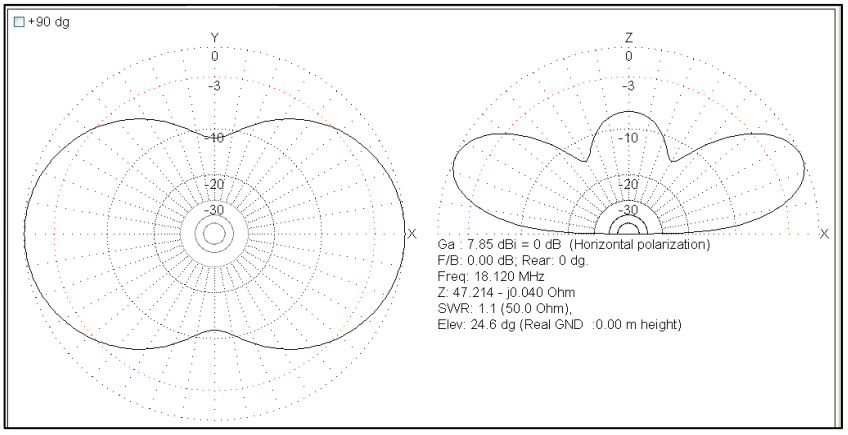
## 3D Far Field Total Radiation Patterns

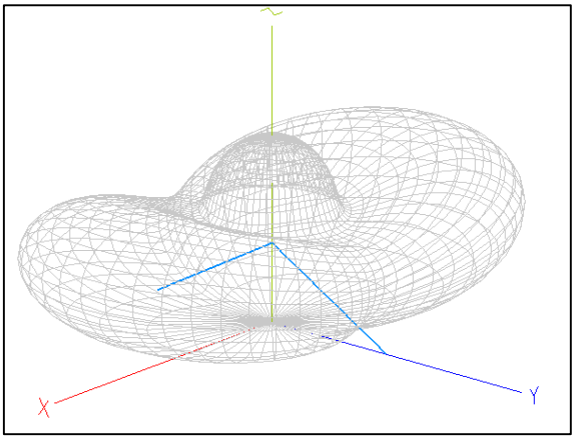


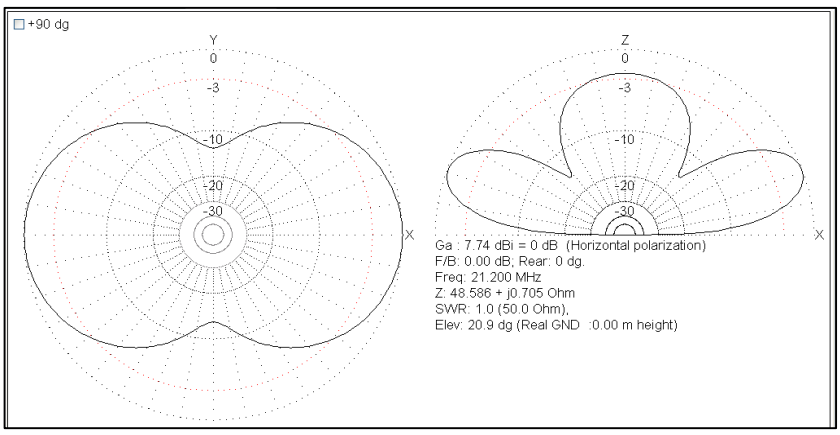



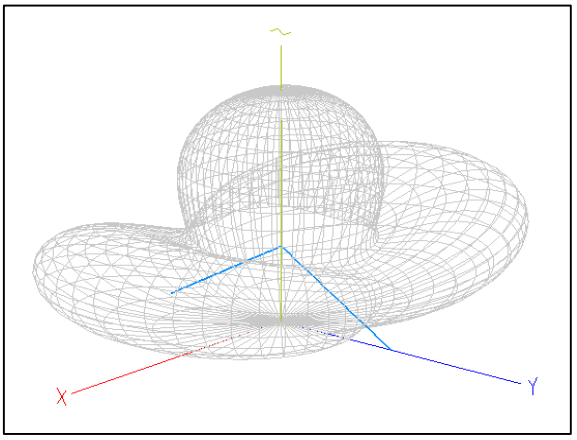




**Antenna all modelled with the apex at 10m, over “real” ground = 5mS/m & dielectric =13 the apex angle set to approx 120 degrees.**