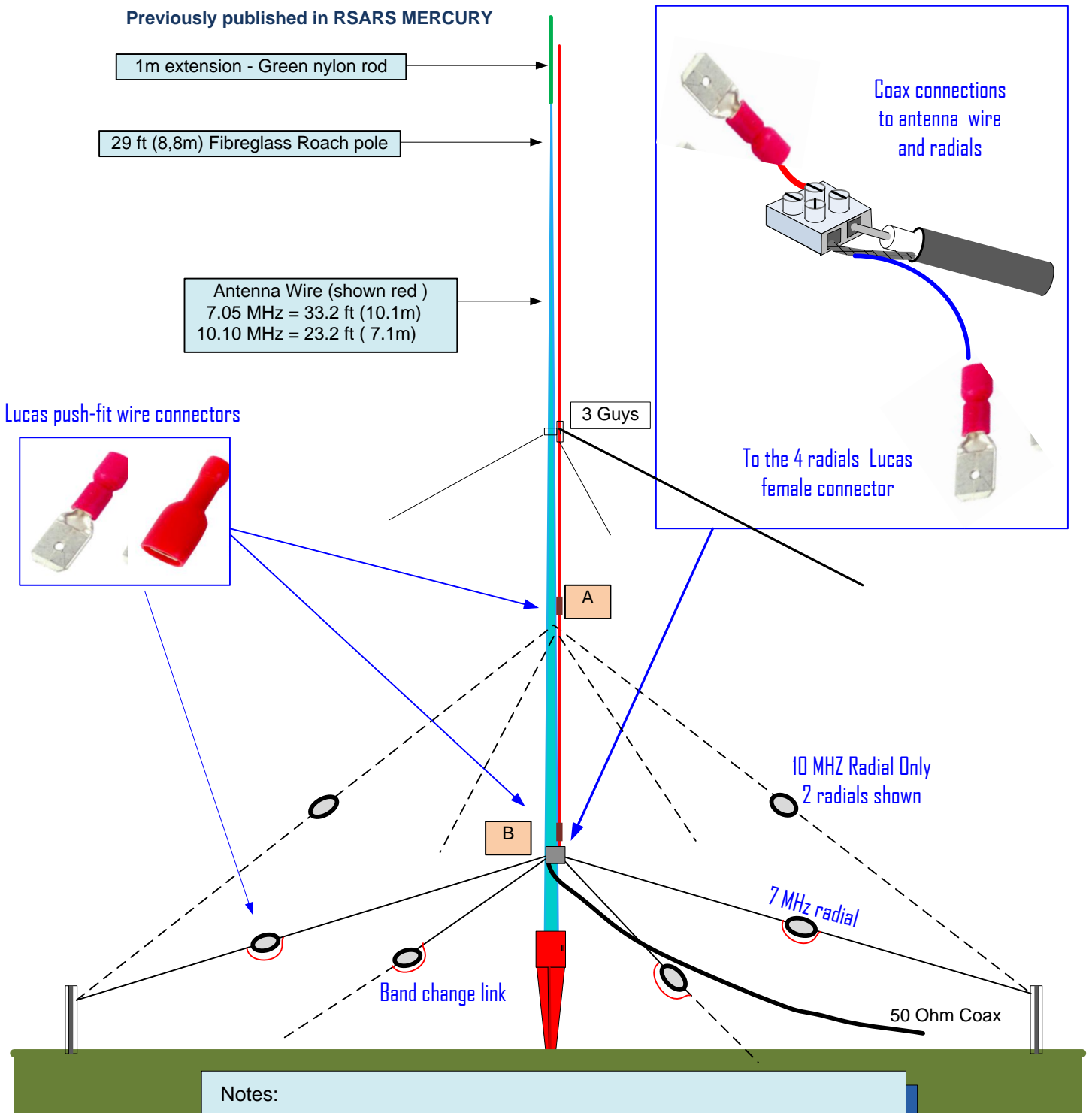


“SAFARI” 40-30m ROACH POLE VERTICAL ANTENNA - G3RWF

<http://www.rsars.org.uk/ELIBRARY/docsants.htm>



Notes:

1. 50 ohm coax connection is made at “A” for 10 MHz and “B” for 7 MHz
2. Note that only two radials are shown – but four are used with this antenna
3. To change bands, slide the radials into the position A or B, leaving the links open for 10 MHz, & snap open the push fit connector and screw the spade end into the electrical block connector to reattach the coax.
4. The roach pole is very light allowing the 4 radials and the 3 light nylon guys to be secured with tent pegs
5. The antenna & radials are all cut slightly longer than a quarter wave measured in feet using the $234/F\text{MHz}$ formula & trimmed for minimum SWR.



Fishing Pole Ground Plane

There is nothing new in this short article but it may stir a few practical ideas. My efforts are all about minimum weight since I need to get it on a plane. I have quite a few roach poles but only take one on my foreign jaunts. It goes in a carrying case which SOTA beams <http://www.sotabeams.co.uk/> sell from time to time.

For the 40M antenna I have a 1metre long thin nylon whip section -bought from B&Q DIY Store - not sure why they sell such stuff. It is strong enough to hold the thin wire I tape up the roach pole . I tried a capacitance hat but managed to snap off the top section doing that - hence the extra whippy section at the top!

Working portable from overseas I had doubts whether an inverted v dipole suspended on my 29' fibre glass fishing pole (or thrown up a tree) at 29 feet was effective for real DX (more than 4000 kms) on the lower frequencies – which are so useful when sun spots are scarce. The height above ground is low and the take off angle is high. That led me to consider making the fishing pole into a ground plane for the 10 and 7 MHz bands – particularly since the feed impedances of an inverted v and a ground plane are both around 50 ohms and so I could use the same feeder – all part of the struggle to keep weight down for air travel.

I made a very simple ground plane for both bands, with a link to switch between them. It has 4 radials – also a quarter wave length long with a link to change bands. It would be very simple to add as many as desired. So far it has only been used at ground level. It was first adjusted for resonance. For some reason (ideas, please?) it resonates lower than the design frequency and the vertical element was reduced by about 10% for each band. I did not bother to shorten the radials. That produced a good SWR on both bands – or so it appears. Adding a further 50' of coax does not alter the SWR which suggests the line is reasonably flat.

Reading the text books (as usual) leads to confusion. It is not clear why the vertical section needs to be shortened for it to resonate (I use very thin (2mm) wire) taped to the fibreglass mast. Is that a factor?) However, the resonant point is quite clear and it is very easy to keep trimming until it does so at the right frequency. The ARRL antenna book (which has the most on vertical antennas) suggests that four radials at ground level (on 7 MHz) are unlikely to provide an effective earth (because of the ground effect). However the match seems OK and the antenna produces results. Obviously there is no time when portable to bury 30 or so radials! I don't have sufficient test equipment to test further – but it has a good SWR - which is important to ensure the FT 857 goes not “fold back” its power output.

Its first test was in the CQWW Phone contest in October 2005. It behaved in text book fashion, compared with my inverted v dipole at 55 feet. European stations were weaker on the vertical but US stations were at least 2 S points stronger. I worked a number of USA stations with 100W of SSB without difficulty. I then moved the whole antenna to another part of the garden to see whether it was affected by locality, trees etc. It was virtually unaffected.

In November I took the fishing pole to Kenya (5Z4LS) both to support my portable inverted v and as a ground plane. It worked well as a ground plane on both bands with an excellent SWR. I worked all continents on both. I have no specific evidence about signal strengths (because everyone lies and gives you 599!) but with 100W I created pile-ups with ease (!) and was usually able to control them – suggesting at least a reasonable signal strength). From an aesthetic point of view, it looked OK – important in a quite smart hotel. It takes about 10 minutes to convert the fishing pole from being a support for an inverted v.

Currently (January 2006) it is on the roof of my house (about 25 feet up) and it matched as easily as it does on the ground. I am considering painting it light grey so it “disappears”. My first QSO was with VA5DX in Western Canada (first call) so I remain hopeful. This is a very cheap and simple antenna – you may like to give it a try.

Finally , the only snag I find with verticals in the UK is that they tend to pick up a lot of local noise on receive.

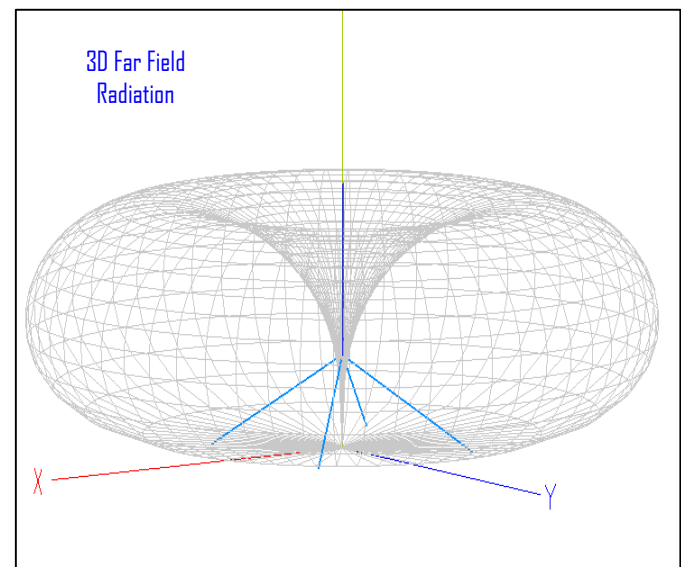
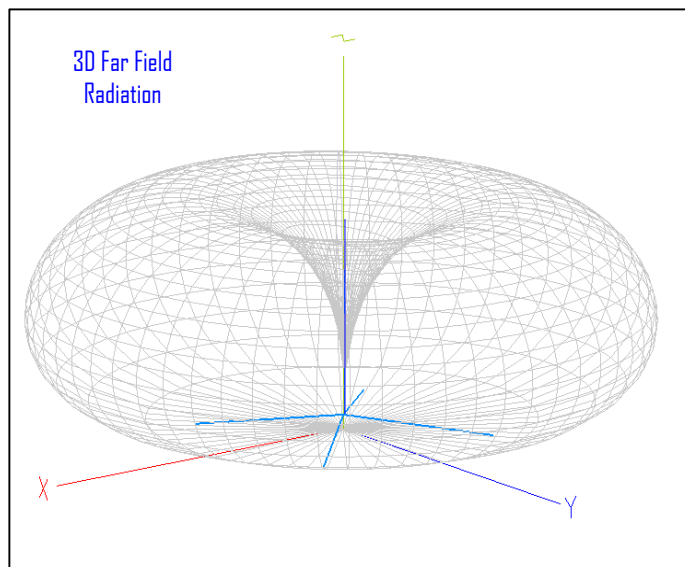
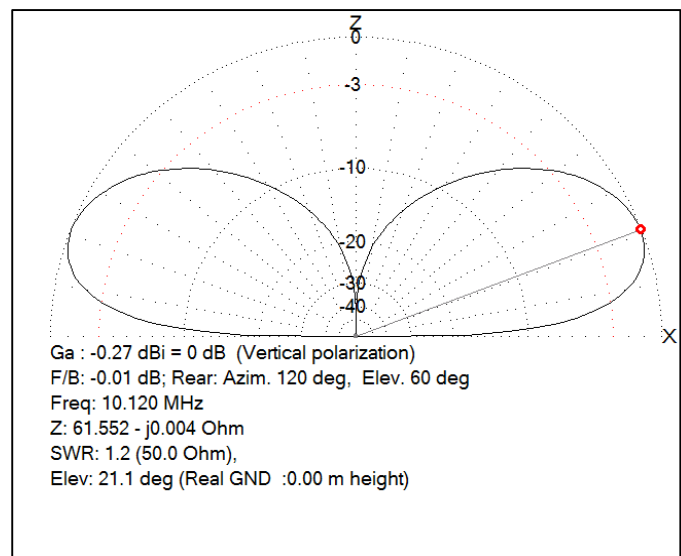
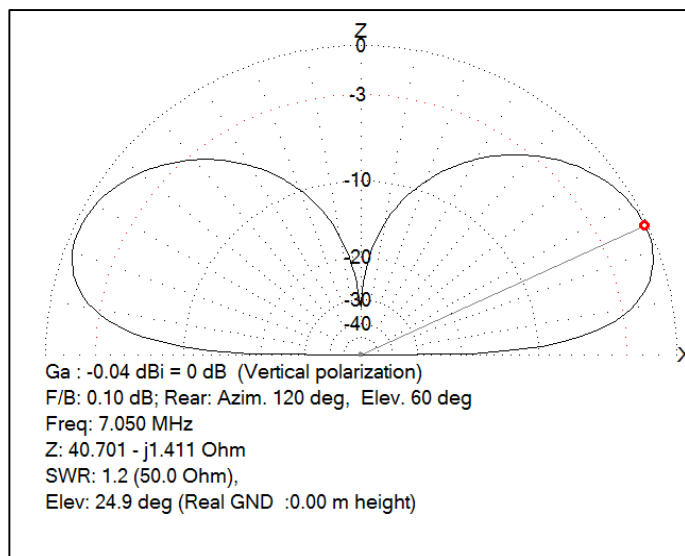
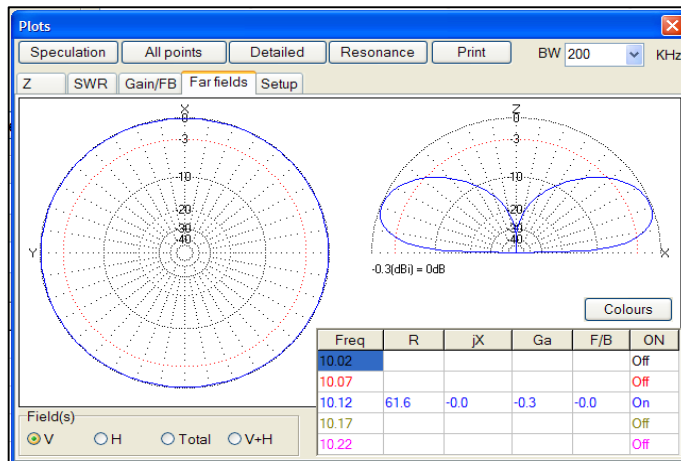
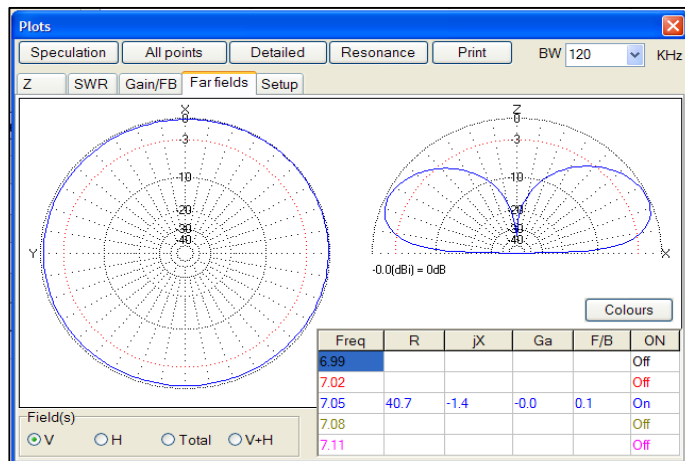
Nick Henwood G3RWF

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MMANA-GAL models for the 40m & 30 m antenna configurations for comparison of :- Impedance ref 50 Ω, Elevation Angle where max radiation is produced and Far Field.



40m Model base :-Radiating element 10.4m long & 1.4 m above ground. The 4 radials 10.62m long & ends 0.4 m above ground.
 30m Model base :-Radiating element 7.03 m long & 4.5 m above ground. The 4 radials 7.03 m long & ends 0.7 m above ground.
 Ground modelled as “REAL” 5ms/m and 13.0 dielectric – i.e. average ground

See also Study of 20m quarterwave vert - elevated groundplane 1.3.pdf in the e-Library