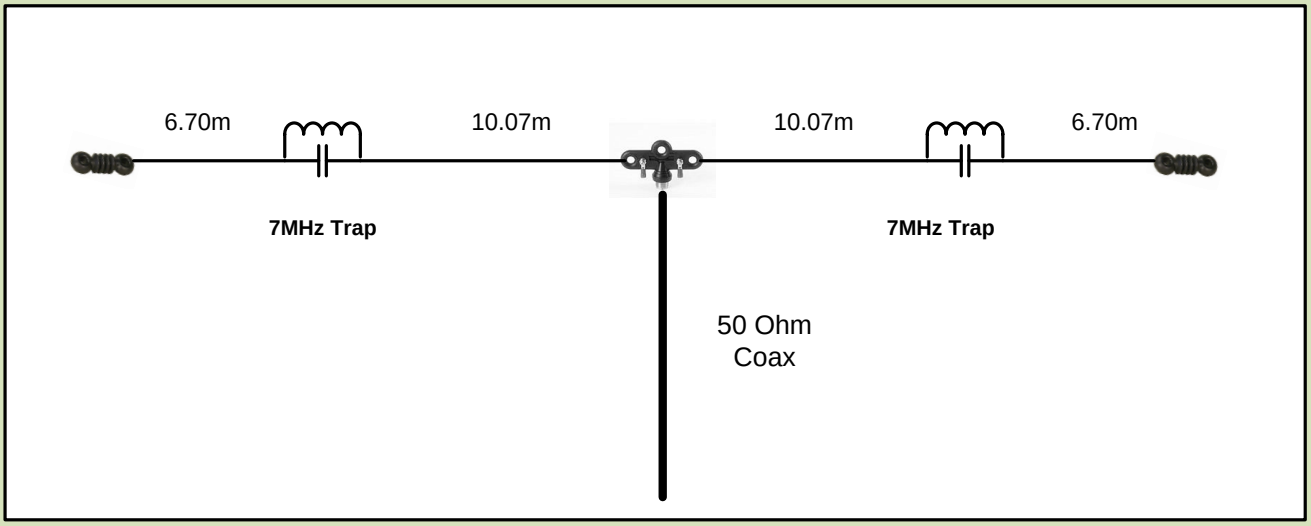
W3DZZ Multi-band Antenna 80-40-20-15-10m



NOTES:- A full analysis of this antenna is available on this link:-
http://sharon.esrac.ele.tue.nl/~on9cvd/E-Multiband%20trap%20antenne.htm

By Bob J. van Donselaar ON9CVD

G3DVL used a coaxial trap for his version see page 2 for details of its construction

The ground slopes downhill slightly from left to right and the masts at the ends are only about 5-6metres high. The far right mast is made of 2x2 inch wood and lashed to the small tree with nylon rope to prevent damaging the tree. The coax used by G3DVL is air-spaced dielectric 75 Ohm TV coax in conjunction with an MFJ 948 ATU.

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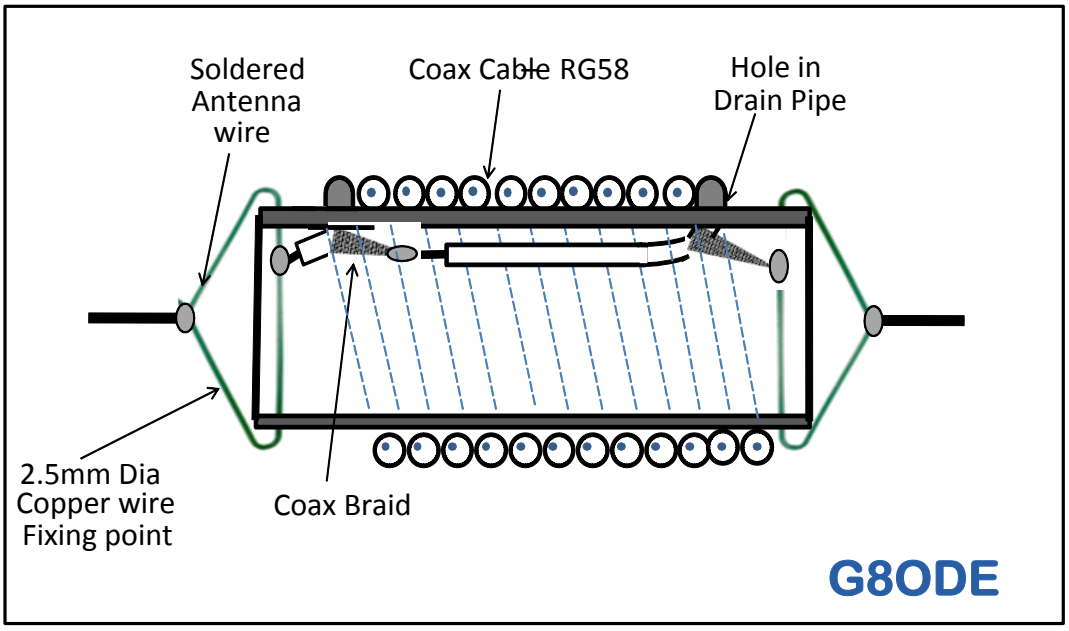

Here is a photograph of the 7.0MHz Trap made using this form of construction. The coax has been taped over for additional protection and the ends have been sealed by fitting plastic discs and sealing with silicone bath sealer

N.B. A very useful tool for coax-traps is a program by Tony VE6YP called "coaxtrap.exe". The program can be downloaded his website *www.qsl.net/ve6yp* .

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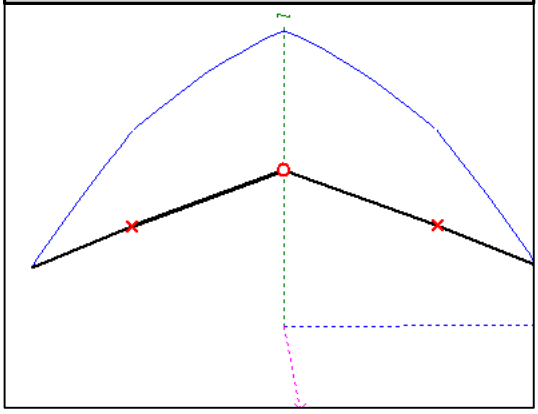
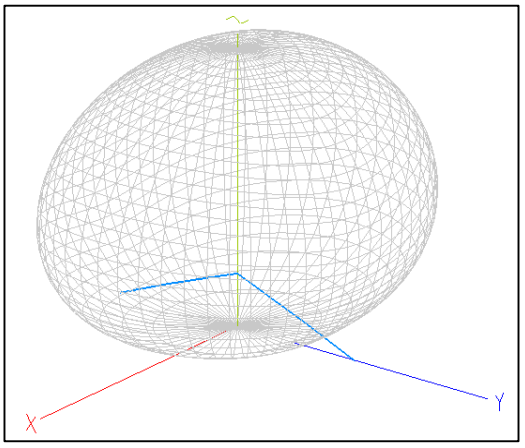
N.B. Antenna Plots produced using MMANA-GAL Antenna Model Program – 10m plots omitted to save space. The Antenna was modelled at 10m above the REAL Ground whose Conductivity=5mS/m and Dielectric = 13.

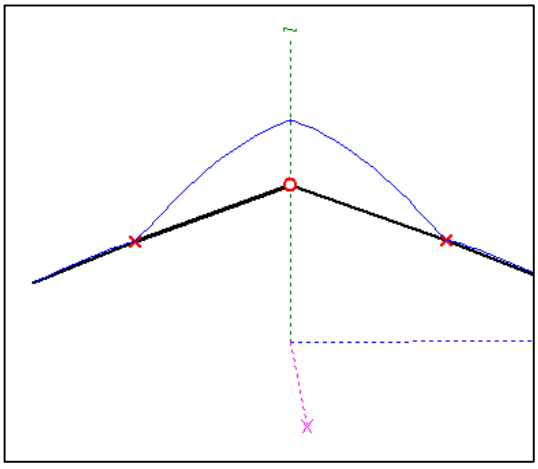
On the plots below the red X denotes the 40m trap. The red O denotes the source of transmitter.



3.55 MHz Antenna Current Distribution and 3D Far Field Radiation plots.

The 3.55MHz current plot shows that the 40m trap is not operating and the antenna is behaving as a simple dipole. Since the height is 10m and this is a 1/8 wave above ground, the antenna exhibits significant NVIS properties with a single lobe.

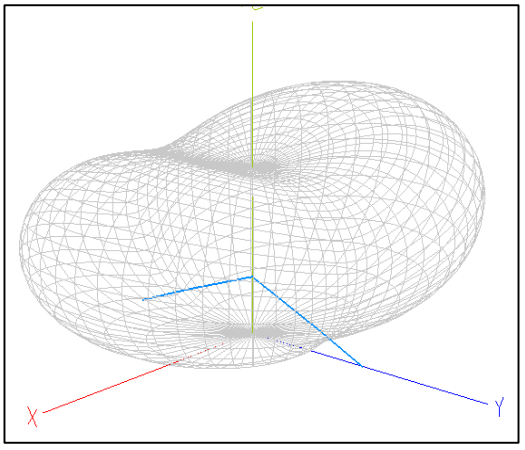


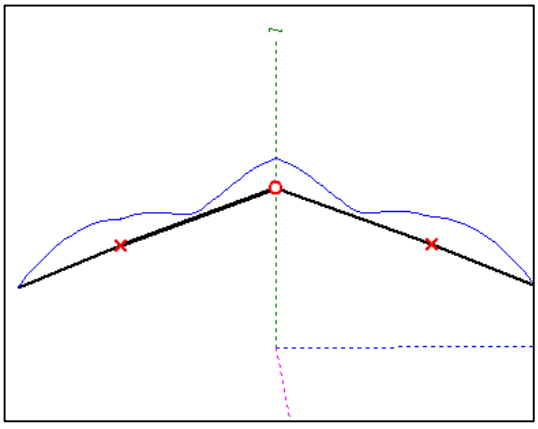


7.07 MHz Antenna Current Distribution and 3D Far Field Radiation plots.

This time the current plot shows that the 40m trap is operating.

Then antenna is behaving as a simple dipole. The height of 10m above the gound is a ¼ wave, and the antenna still exhibits significant NVIS properties with a single slightly elongated lobe in the broadside direction.

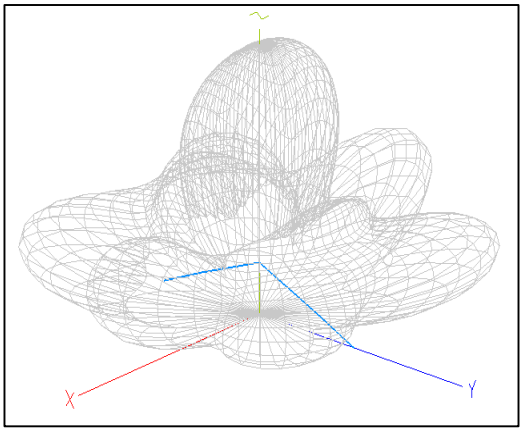


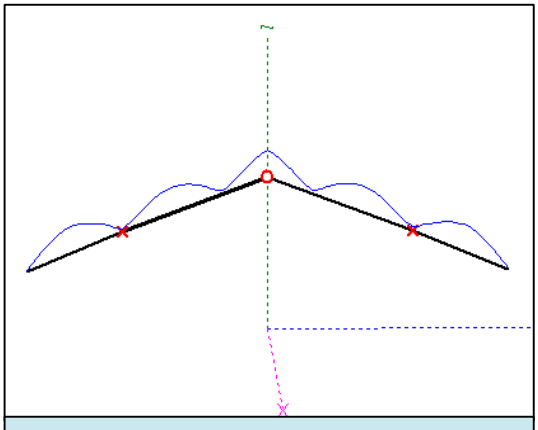


14.05MHz Antenna Current Distribution and 3D Far Field Radiation plots.

The 14.05 MHz current plot shows that the 40m trap is not operating and the antenna is behaving as ¾ wave dipole.

The antenna is now just ½ wave above the ground ,and the effects of ground reflections have been reduced, enabling 6 low angle lobes to appear providing DX radiation, and a single NVIS lobe.

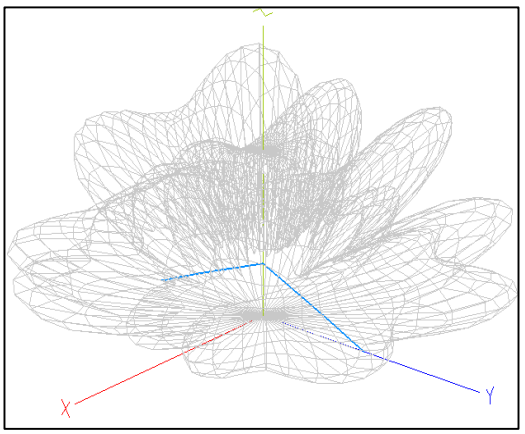




21.05MHz Antenna Current Distribution and 3D Far Field Radiation plots.

The 21.05 MHz current plot shows that the 40m trap is not operating and the antenna is behaving as 5/4 wave dipole.

The antenna is now just about 2/3 wave above the ground ,and the effects of ground reflections have been reduced further. There are 10 low angle side lobes providing DX radiation in several directions, and further 3 high angle NVIS lobes.



The plots above show that the current's amplitude changes as the impedance of the antenna changes with frequency.

G8ODE 22 jan 2009 iss 1A