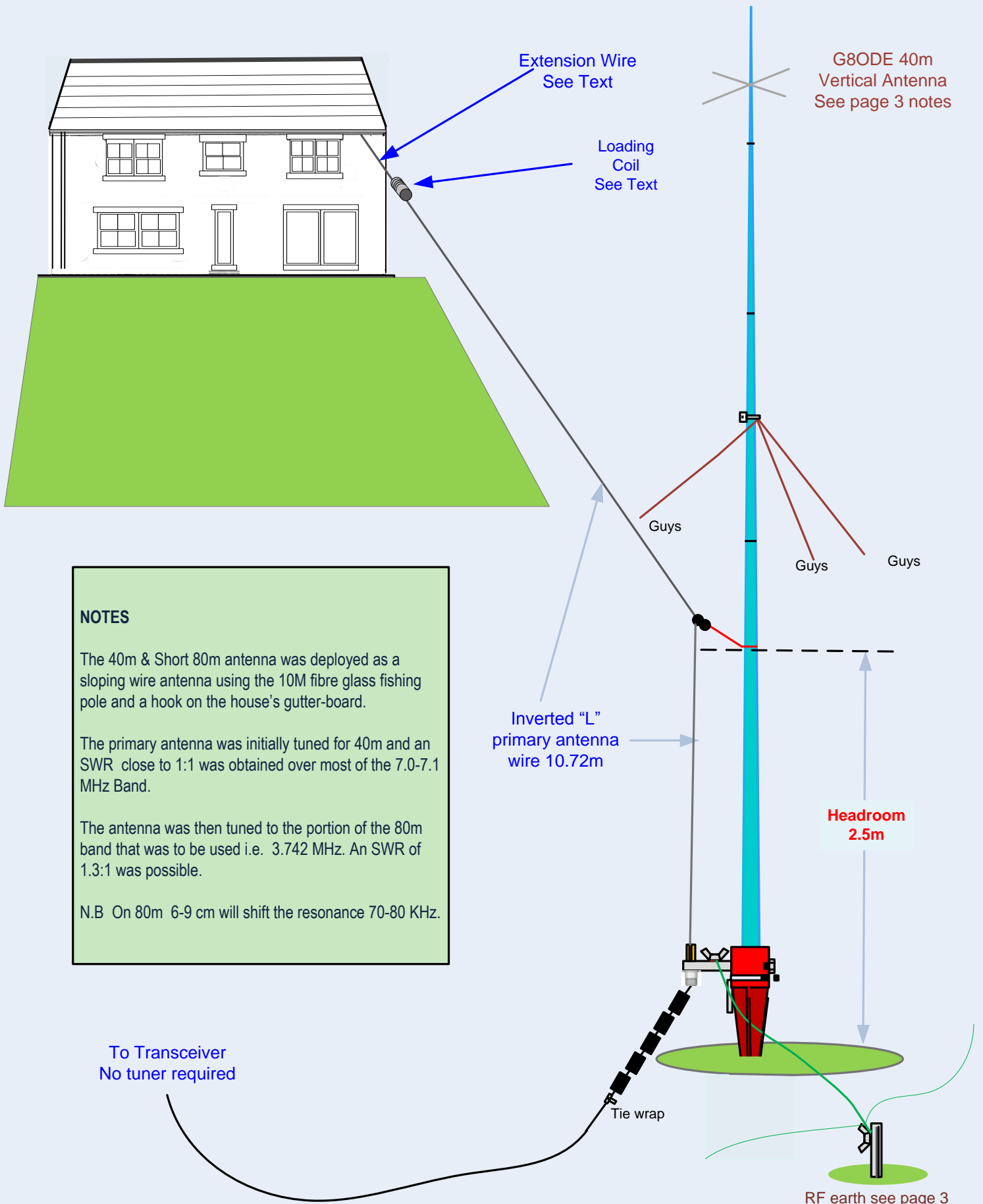


40m & short 80m Wire Antenna – G8ODE

Bonus 160m operation too!

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



NOTES

The 40m & Short 80m antenna was deployed as a sloping wire antenna using the 10M fibre glass fishing pole and a hook on the house's gutter-board.

The primary antenna was initially tuned for 40m and an SWR close to 1:1 was obtained over most of the 7.0-7.1 MHz Band.

The antenna was then tuned to the portion of the 80m band that was to be used i.e. 3.742 MHz. An SWR of 1.3:1 was possible.

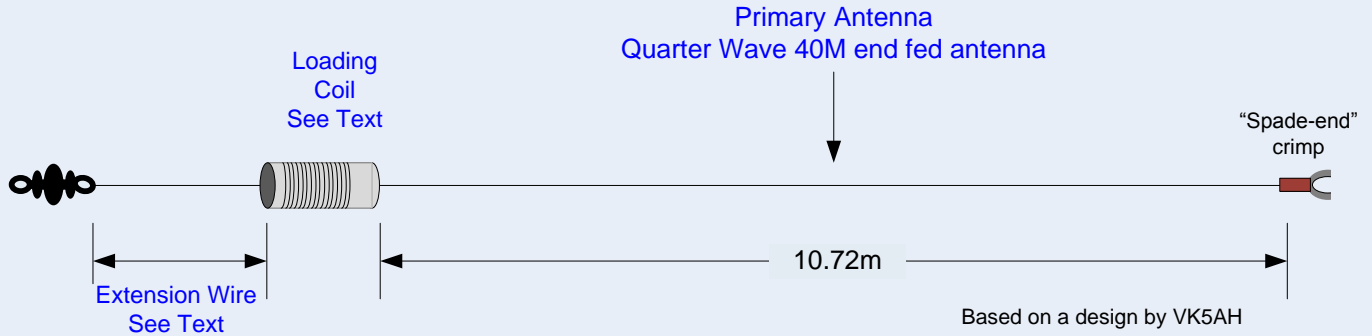
N.B On 80m 6-9 cm will shift the resonance 70-80 KHz.

To Transceiver
No tuner required

40m & short 80m Wire Antenna – G8ODE

Bonus 160m operation too!

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Construction Notes

The lightweight loading coil was wound on a 52mm diam Black Pepper Corn Spice Tub

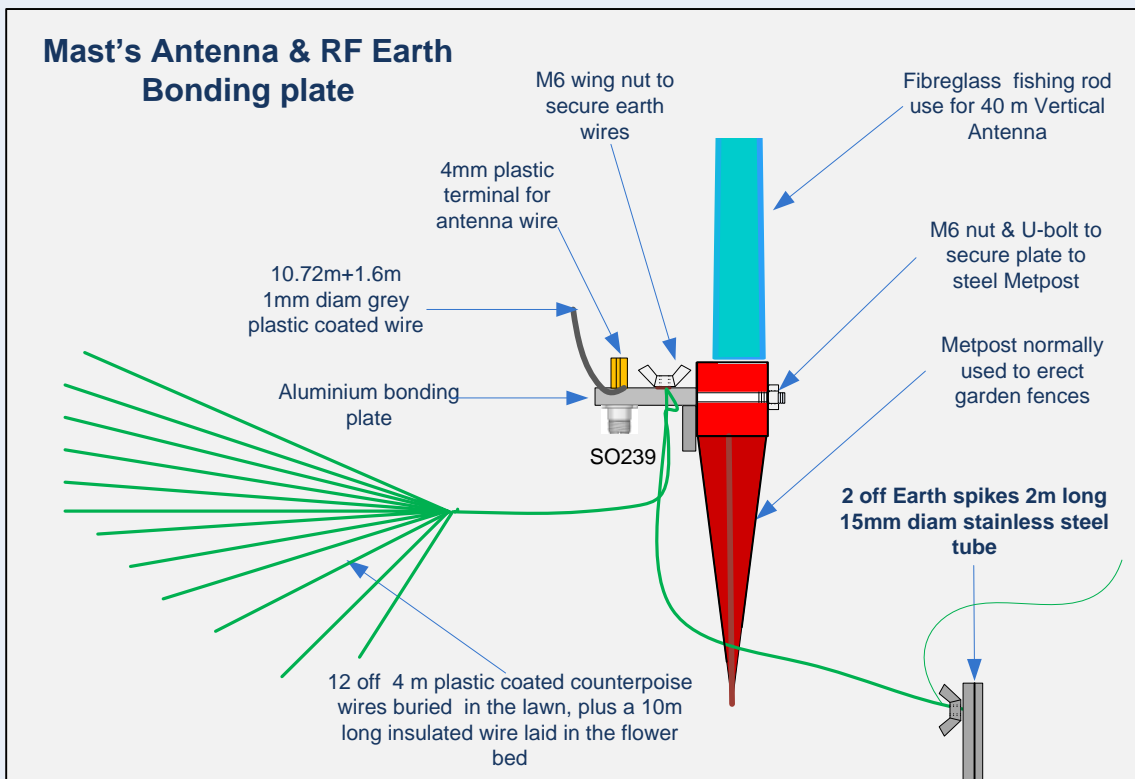
The coil's Inductance is 118uH and requires 61 turns of close wound 0.07mm stranded wire with an OD of 1mm. Grey wire was used as this is virtually invisible from about 10m way.

On 40m the loading coil acts as a choke and isolates the extension wire. The antenna wire was adjusted for an SWR minimum close to 1:3:1 on 7.1MHz. This remained roughly the same between 7.00-7.17MHz.

For 80m operation on 3.742MHz the extension wire is 1.62m long. The SWR was adjusted for a minimum and the 1.5:1 points were 3.705 & 3.650MHz. Care should be taken as a few cm's can move the resonance point 80KHz.

For 160m operation on 1.946MHz the extension wire is 7.31m long. The tuning is very sensitive to small changes in extension wire length of a few cms.

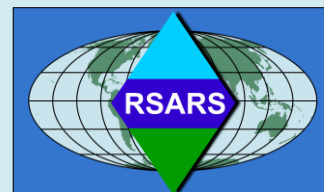
On 160m the antenna is 17.31m long or nearly an eight of a wave and low but useful efficiency.



40m & short 80m Wire Antenna – G8ODE

Bonus 160m operation too!

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



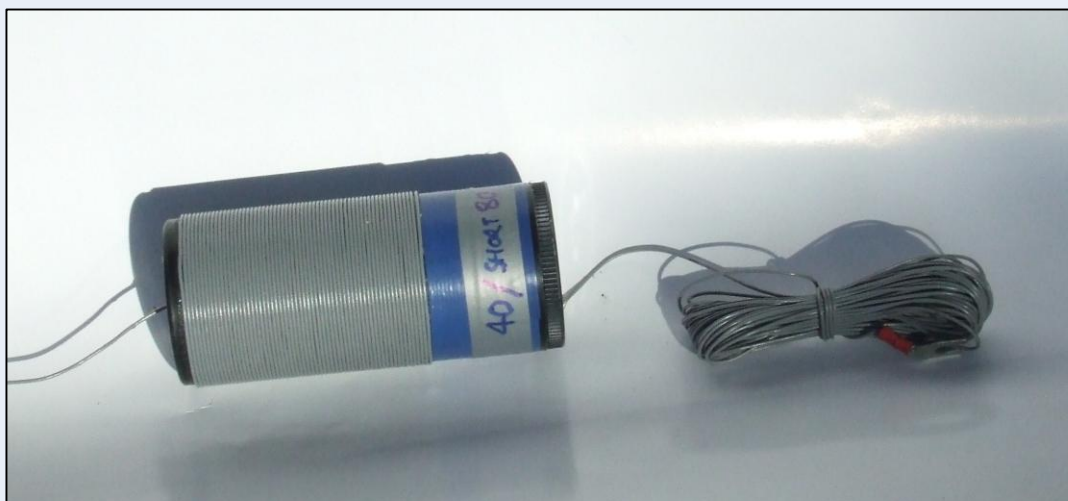
The 40m – Short 80m Antenna (160m)

Construction notes.

The loading coil is wound on an old Supermarket plastic spice tub that contained peppercorns. The knurled end is the lid and comes off. The tub was chosen because of its light weight construction, thus making it easy to put the antenna up, and because it would not mechanically load the thin antenna wire causing it to stretch. The 40m antenna is shown coiled up at the side and ready for being packed away inside the tub for the next excursion.

Tip. The tub's label has to be removed. This is done by first soaking the tub in very hot water, then scraping the label off using your thumb. This will usually leave a tacky residue on the surface of the plastic tub and is used to secure the 62 turns of 1mm OD wire onto the loading coil. After finishing the winding the coil can be cleaned up using some WD40 and a soft cloth or turpentine substitute.

Not shown in the photograph is the small dog-bone insulator is connected to the 1.62m extension wire



Adjusting the 40m – short 80m (160m) antenna.

(the 40m vertical antenna was detuned by removing 1.5m of wire for these tests)

The 40m-short 80m antenna was tested as a fairly low sloping inverted "L" as shown on the first page.

On 40 m the SWR was very close to 1:1.3 over the majority of the 40m band. Tests with GM4FOZ on the RSARS 40m Net gave a respectable report from Berkshire England of 5/6- 5/7 when the conditions were not particularly good.

On 80m the extended antenna had an SWR of less than 1.3:1 over about 60KHz segment of the 80m portion of the band centred on 3.740MHz.

Once a suitable hook is installed in a nearby tree the antenna will be retested in a more vertical position with an SWR of 1.3:1 so the DX results can be compared .

On 160m because of the 7.31m length of the extension wire and limitations of space, the antenna could only be tested with it deployed diagonally across the lawn to the corner of the garage. The height of the top horizontal section was about 3m above the lawn. By careful trimming 1cm at a time the SWR was reduced to 1.3:1 but only for a very narrow section of the band.

For the 160m antenna the Initial SWR 2:1 points were at 1.830MHz & 1.874MHz with a minimum SWR of 1.2: at 1.850MHz. The antenna was carefully tuned to 1.846MHz by shortening the extension wire 1cm at a time.

40m & short 80m Wire Antenna – G8ODE

Bonus 160m operation too!

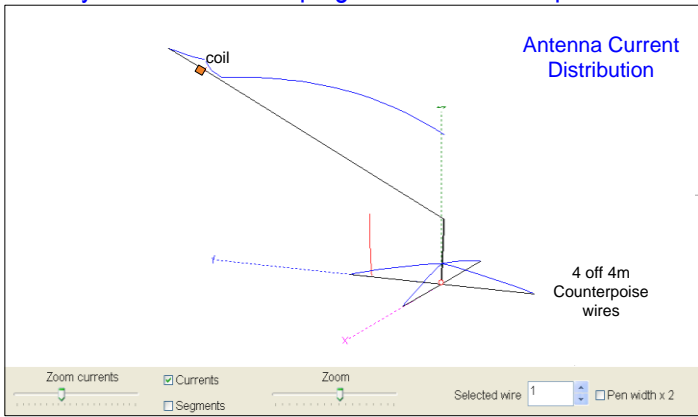


<http://www.rsars.org.uk/ELIBRARY/docsants.htm>

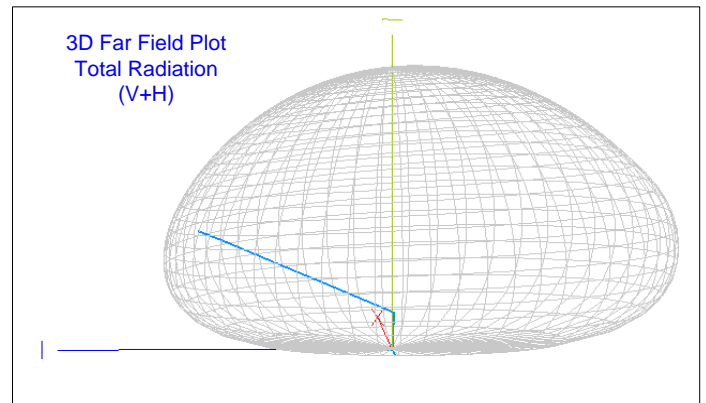
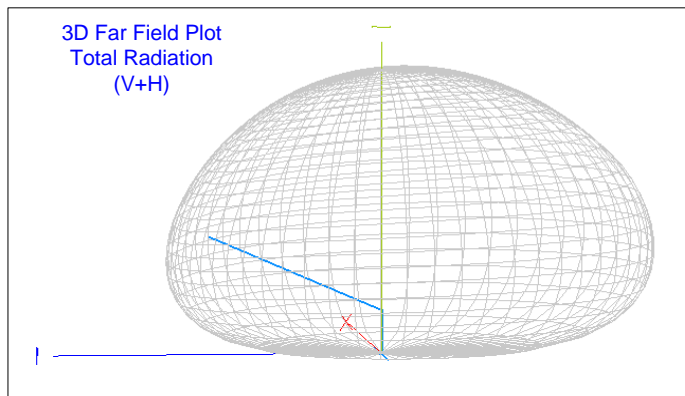
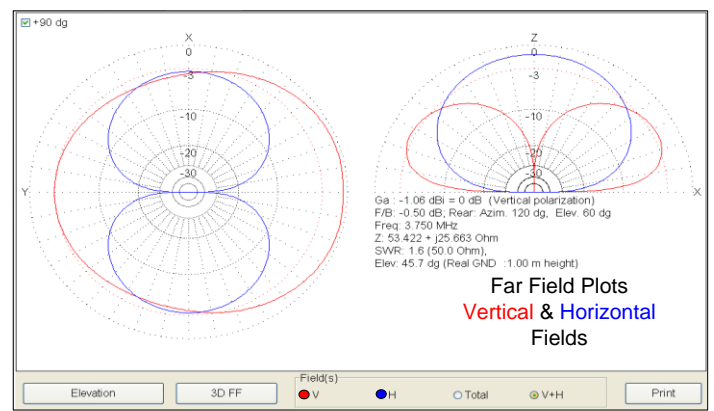
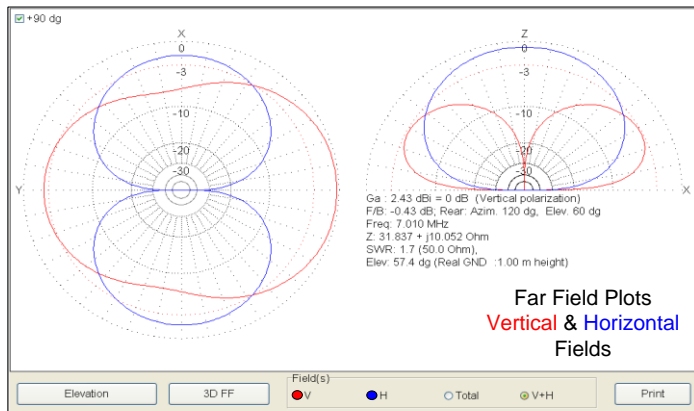
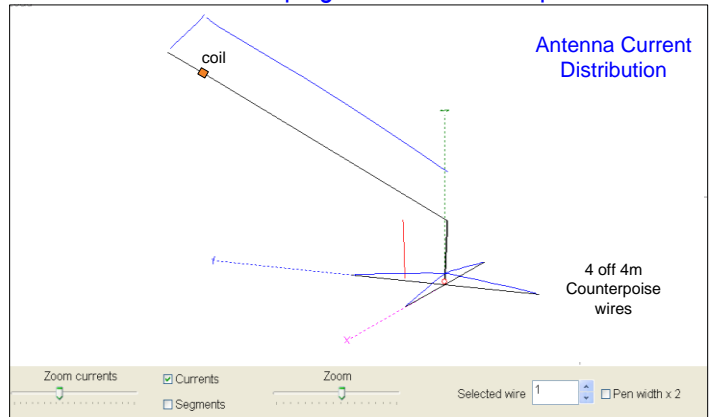
DESIGN.

The MMANA-GAL Antenna Analysis program was used to design this antenna. This involved simulating the 40m inverted “L” as it would be deployed at the G8ODE QTH, and adjusting the model to get a reasonable SWR ($<1.7:1$), then adding the extension and using the program to discover what value of inductance was required to reduce the SWR back to $<1.7:1$. The program was then used to calculate the number of turns required for the 52mm diam former. The theory seemed to work and in practice only very minor adjustments were required.

Primary 40m antenna Sloping Inverted ‘L’ Freq = 7.01 MHz



Short-80m mode Sloping Inverted ‘L’ Freq = 3.75 MHz



Material		MMANA-GAL Model Results for 40m Inverted ‘L’ & Short 80m Portable Antenna – G8ODE										
No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.	
2	3.75	53.42	25.66	1.64	---	-1.06	-0.5	45.7	Real	1.0	vert.	
1	7.01	31.84	10.05	1.67	---	2.43	-0.43	57.4	Real	1.0	vert.	