

THE VK3EMU TRI-BAND SQUID POLE.

Tuning Procedure

1.

List of items that make up the pole are:-

One 10 section 10M Tunny squid pole from sales@rippletech.com.au

From the base we have one base plate sitting on the top of the first section to attach the coax, earth and antenna wire to.

One 6M+ length of insulated wire, the + allows for trimming when tuning this 20M band section.

Fitting the sixth section and sitting on top of the fifth section is the 20M trap.

One 2.1M+ length of insulated wire, the + allows for trimming when tuning the 40M band section.

Fitting the eighth section and sitting on top of the seventh section is the 40M trap.

One 2.8M+ length of light insulated wire, the + allows for trimming when tuning the 80M band section.

One small SS wire hook with three loops in it that will allow the end of the wire to thread through.

2.

Slide base plate over second section to rest on top of first section with PL259 pointing down and banana sockets pointing up.

3.

Plug the 6M length of insulated wire into the coax centre banana plug.

Wind the 6M length of insulated wire around the 2,3,4 and 5th section finishing at the top of the 5th and fix there with electrical tape leaving the few cm's of + amount above the tape.

4.

Stand the extended pole up into position where you want to use it with the base somewhere within .5M near the ground, **has to be in this operating position for every test.**

5.

Loop once the 13.95M of RG58C/U coax around the base of the caravan, car and attach one end to the PL259 socket on the base plate and place the other near where you wish to have the transceiver.

6.

Attach your antenna analyser to the coax end that is going to be attached to your transceiver.

I use a Comet CAA-500 analyser with the twin needle metre, this I find is very user friendly to the eyes and very easy to use.

7.

Switch the analyser on to the 14.2 meg area and find where the swr swings low and the reactance needle shows approx. 50 ohms.

With the + length on the wire the swr should be minimal at a frequency lower than the 14.2 meg.

Trim the + length till the swr sits about + or- .05 meg either one side or the other around 14.1 meg.

Swing the frequency so the swr goes as low as possible, if it sits above 1.2 to 1 it is mostly because you have a ground plane, earth problem.

Plug a length of insulated wire into the earth banana socket of the base plate and making it as short as possible take this to the nearest earthing point on the caravan, car or earth stake if necessary and you will find that this will bring the swr down to an acceptable value.

Trim the + length so the 14.2meg goal is achieved, this will be slightly more inductive for the upper part of this band which is recommended rather than being capacitive.

Re fit the banana plug so it can now be plugged into the bottom of the 20M trap.

8.

Slide the 20M trap onto the sixth section so it rests on top of the fifth section.

Plug the top of the 6M wire into the bottom of the 20M trap.

Plug the 2.1M+ wire into the top of the 20M trap and wind it around the pole the same direction as the 20M wire and using insulation tape to hold it at the top of the seventh section where the 40M trap will rest later on.

9.

Switch on the analyser and change its frequency to the 7.05 meg area and see where the swr will drop.

Trim the top end of the 2.1M + wire till the swr comes to this lower band frequency.

Adjust and solder the upper shorting wire onto the appropriate winding to achieve a centre frequency area in which you wish to work.

20M and 40M are now tuned but not able to stand alone as yet, that comes later.

Re fit the banana plug so it can now be plugged into the bottom of the 40M trap.

10.

Slide the 40M trap onto the eight section so it sits on top of the seventh section.

Plug in the top of the 2.1M wire into the bottom of the 40M trap.

11.

Plug the 2.8M wire into the top of the 40M trap.

Wind this wire in the same direction as the other two, onto the 8th, 9th and 10th sections so what ever is in excess of the 2.8M terminates at the top of the pole and is held up by threading through the three looped terminating hook.

12.

Turn on the analyser and tune it to the 3.5meg area and find where it dips.

Trim the very top protruding wire until you achieve a mid-frequency of about 3.6meg.

Once achieved, wind remaining wire at the tip onto the rod so it just hangs out of the hook.

13.

Solder the shorting wire at the top of the 40M trap onto a winding that brings the swr dipped at the centre frequency you wish to use, thus allowing you at a later date to be able to change this if needed.

14.

The traps are next, you will have to assemble and re assemble a few times trimming the coax in both traps, you can do both together, just remember which needs what.

Go back to the analyser on the 14.1 area and see where the swr dips fully.

Hopefully it will be lower than the 14.2M and you will need to trim some off the coax thus leaving the coax centre wire tapped onto the sixth coil winding from the bottom.

Write down the freq where it dipped.

15.

Go back to the analyser on the 7.05meg area and see where the swr dips fully.

Hopefully it will be lower than the 7.05meg and you will need to trim some off the coax thus leaving the coax centre wire tapped onto the eleventh coil winding from the bottom.

Write down the freq where it dipped.

16.

Disassemble the two upper windings and the two traps.

Remove the top end caps and let them hang down on the connecting wire.

With tweezers pull out the loose end of the coax and snip off a small measured amount and note.

Rewind the coax back neatly into the pvc tube and replace the endcap.

17.

Re-assemble the antenna and re test the two traps in turn and note the new frequency obtained.

From this it will indicate how much the frequency changes per measured amount of clipped coax you have cut off for each trap.

Determine how much you will have to cut off each coax to bring the frequency up to the desired mid frequency you may wish to use for 20M and 40M.

80M does not come into this operation.

18.

Disassemble the two upper windings and the two traps again.

Repeat the trimming procedure again and re-assemble.

Check the swr dipped frequencies again and note the change in each trap.

Repeat until the centre frequencies are achieved.

Should you cut a little too much off the coax, change the bottom tuned circuit tapping up one winding, this will lower the trap frequency again and is easier than changing the coax.

19.

Check the 3 bands now for the desired centre frequencies and that the swr is low and the reactance is about 50 ohms.

If you are having trouble getting the swr down, the earthing system isn't quiet right, try a slightly different earthing point.

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TRI-BAND SQUID POLE
80M, 40M, 20M.

Page 1 of 5

2.8 m
 Smaller Dia Insulated wire
 Plug on bottom end hook on top end to hook into Rod eye.

Attachment hook to hook in rod eye

3 Loop on hook to thread antenna WIRE through as termination for end of antenna WIRE

55T on 470D Former

2.1m Insulated WIRE Plug on each end

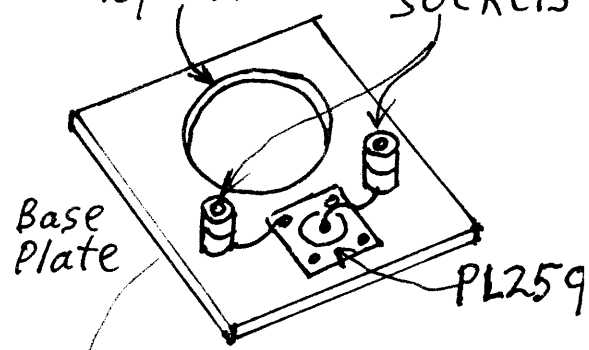
1.95m

18T on 470D Former

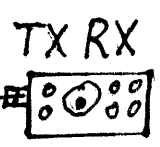
6m Insulated WIRE Plug on each end

3.7m

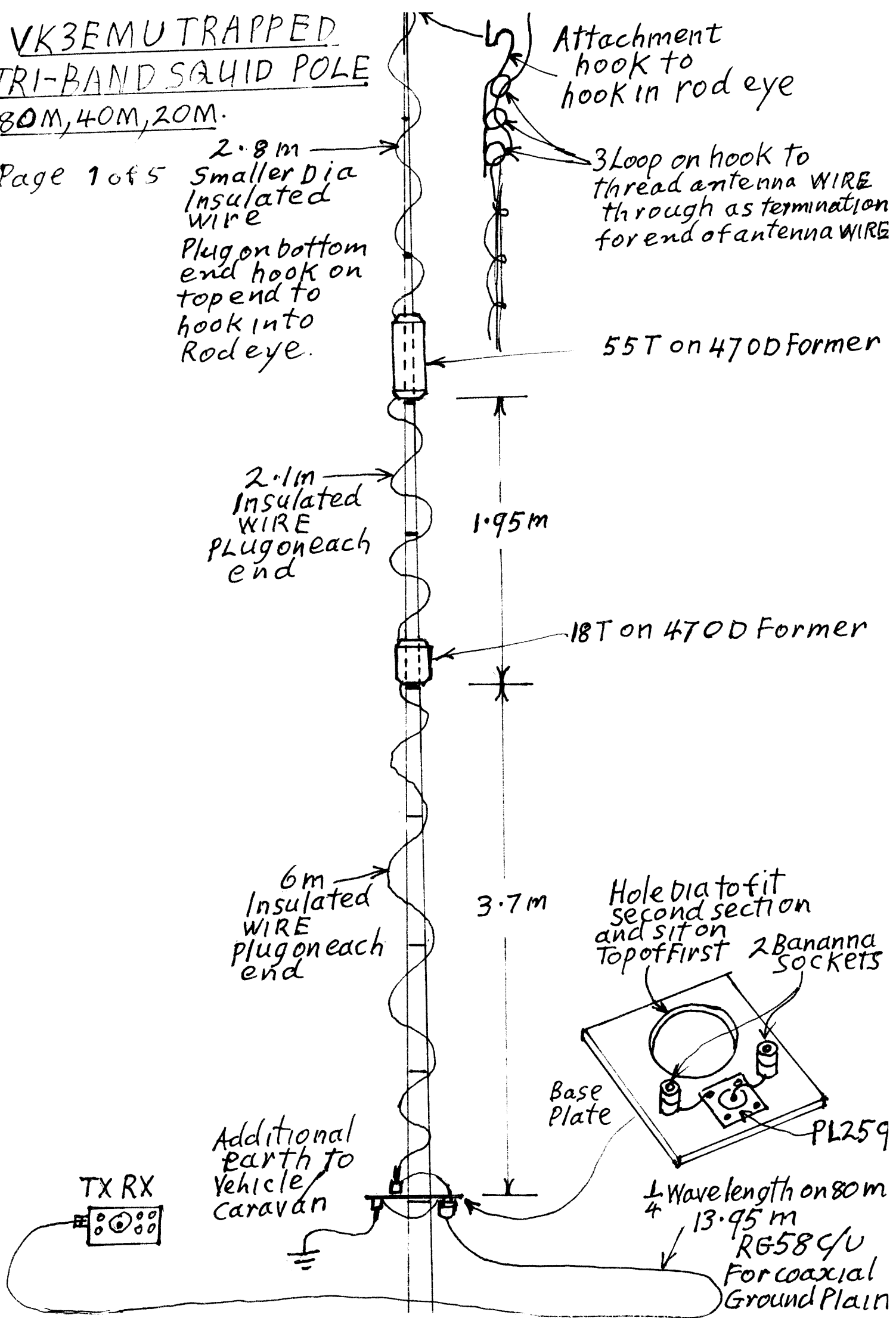
Hole dia to fit second section and sit on top of first 2 Banana sockets



Additional earth to Vehicle/Caravan

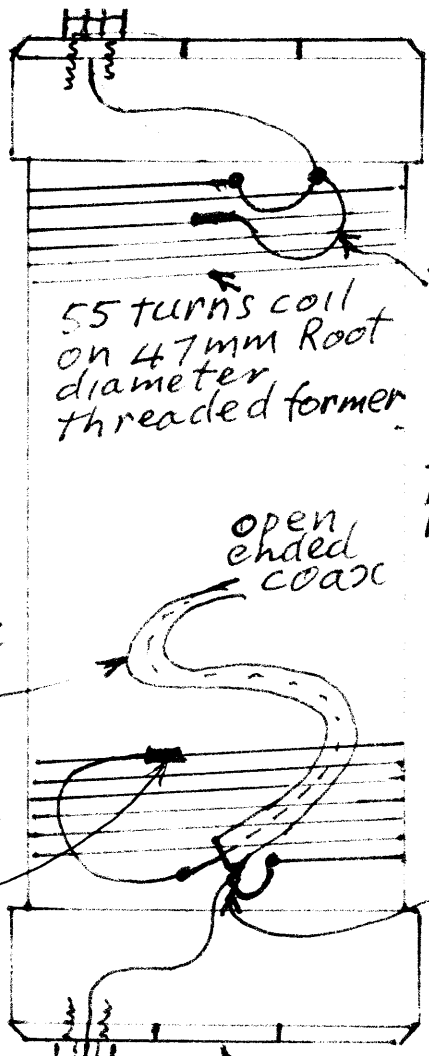


$\frac{1}{4}$ Wave length on 80m
 13.95m
 RG58 C/U
 For coaxial Ground Plain



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SQUID POLE

Page 2



Hole approx 28mm to suit 6th pole section and sit on top of 5th. Holes are offset to accommodate banana plugs in endcap

55 turns coil on 47mm Root diameter threaded former

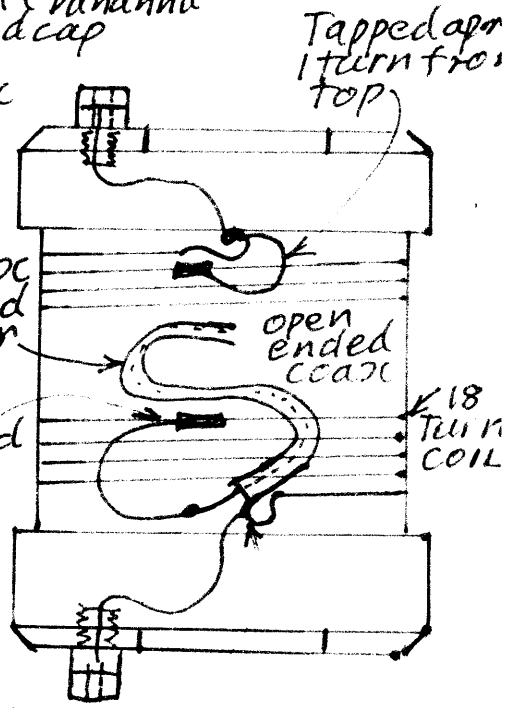
Tapped approx 1 Turn from Top

6.5 turns approx RG-58C/U Coiled inside 42.5mm ID PVC Pipe former

Centre of Coax Soldered to 11th coil WINDING

Coax centre Soldered to wire tail to go to the 11th turn on coil

Hole approx 18mm to fit over 8th pole section and sit on top of 7th



Tapped approx 1 turn from top

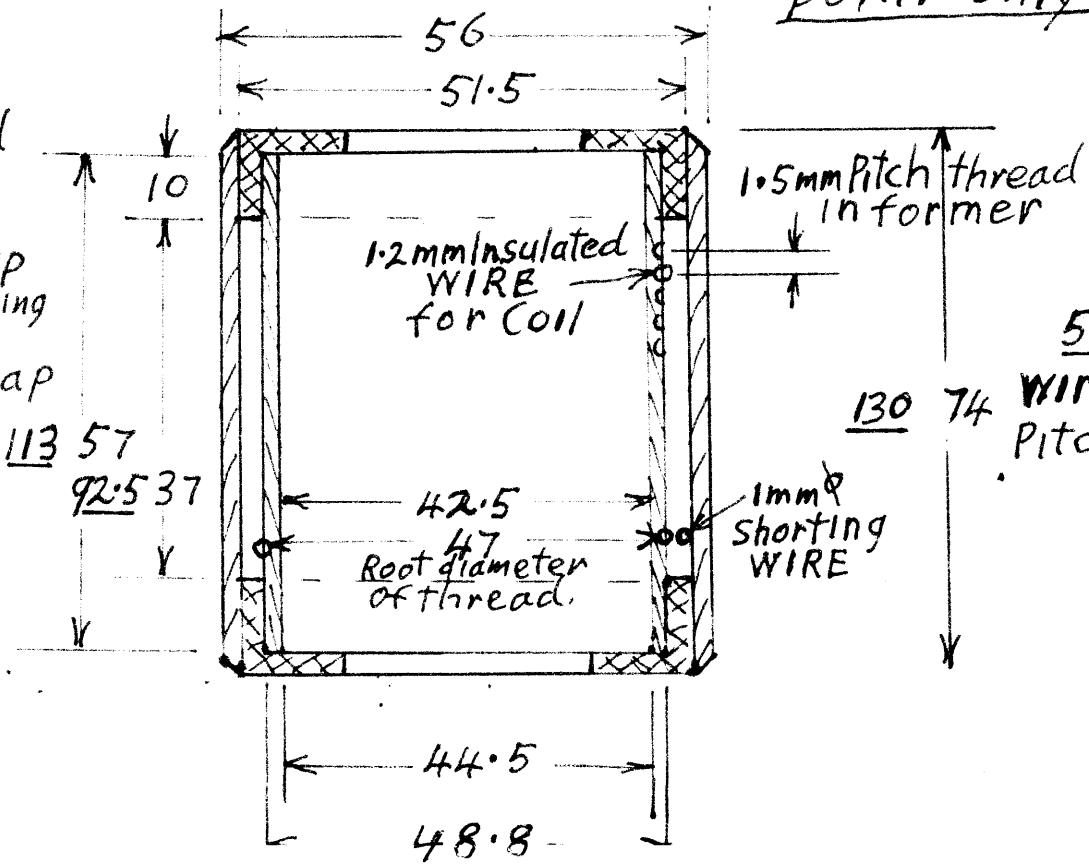
3 Turns approx RG-58C/U Coiled inside former

Centre of Coax Soldered to 6th coil Winding

Banana plug, Start of coil and Coax Braid Joined

NOTE
Coax and Coil both wound in same direction inside and outside former, Interest point only

NOTE:-
Underlined dimensions are for the 40 metre trap the accompanying one is for the 20m trap the rest apply to both traps.



55 18 Trns
Wire 1.20mm
Pitch 1.5mm