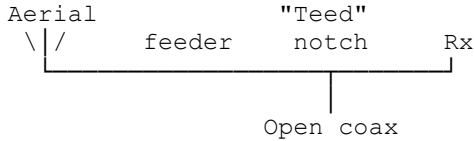


Coax Traps

By G8MNY

(Updated Nov 08)

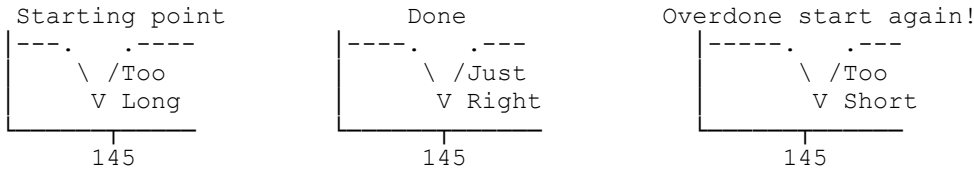
To make a coax trap to reject a frequency you basically just T any piece of low loss coax with electrical length equal to a 1/4 wave for the notch frequency needed, across the aerial feeder/socket.



Leaving the teed coax "open" a 1/4 wave back from that where the T is you get the opposite impedance "a short circuit", & it this that gives the attention across the feeder. So the lower loss in the trap coax the deeper the notch.

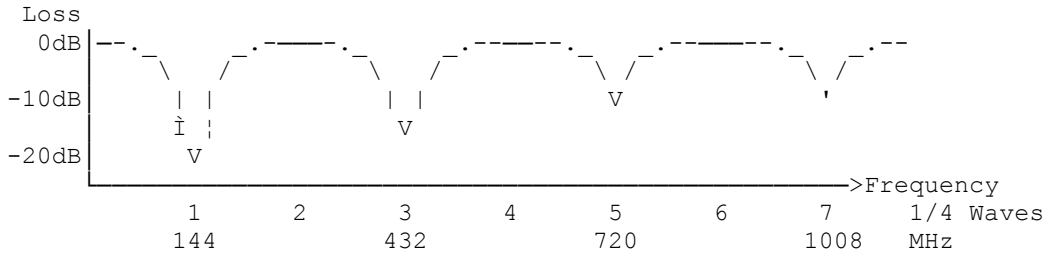
To determine the physical length the coax velocity factor is needed (how much shorter than an actual 1/4 wave the coax has to be). e.g. 0.66 for clear poly & 0.78 for air spaced & foamed (white) poly.

Cutting the length too long & trimming it shorter at the lower frequency e.g. 144MHz not 145MHz to start with, so you know the depth of the notch then trim on frequency until the signals attenuates at the wanted frequency.



This is more difficult if the trap is for say a 158MHz pager Tx to a 2m Rx, than say 145MHz to VHF Rx, unless you have signal generator & a Rx for the frequency (scanner). See multiple resonance below.

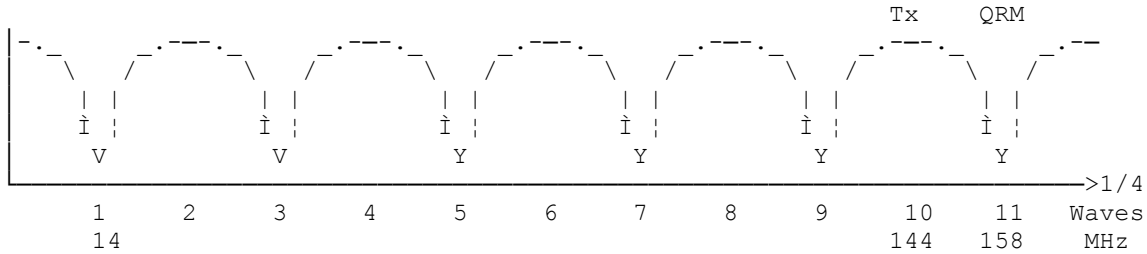
Using a 1/4 wave coax stub on 144MHz also works on 3x @ 432MHz, but unwanted notch @ 5x 720MHz. This may not be what is wanted for a UHF TV Rx !!



Of course leaving a teed piece of coax across a Tx feeder would upset the SWR!

MULTIPLE RESONANCE TX TRAPS

On a 2 Tx site use can be made of this multiple notch, to stop PA inter mixing instead of circulators, if the 2 Tx are a fair frequency apart. The open circuit coax length needs to be approx a 1/4 wave at the difference frequency & an even number of 1/2 waves at each Tx. Or say a 400W pager Tx on 158MHz & 144MHz nearby ham with Rx QRM, coax of about $0.66 \times 1/4 @ 14\text{MHz} = 3.5\text{m}$ long cut back to 3.446m for reject & 3.4m pass.

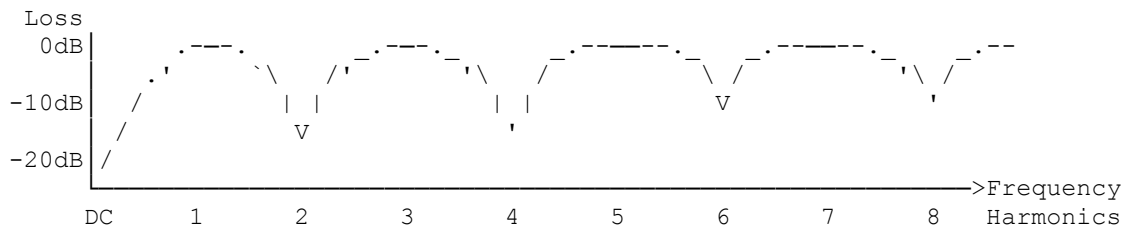


With heavy low loss coax this approach can give a QRO trap that is open circuit on the Tx frequency, but 20dB down on a nearby QRM frequency. To set up the coax is just TEED to the Tx line with a Rx looking at the QRM instead of the Tx then the line is trimmed to null out the QRM. On Tx of the line is still near a 1/2 wave line resonance so on Tx the SWR will still be 1:1.

See also my bul "VHF/UHF TVI Filter" & also "HF Rx Suckout Trap".

DC SHORT & HARMONIC ATTENUATING

However using a short circuit 1/4 wave Teed in a Tx/Rx for its frequency, will attenuate all even harmonics & protect from static. The shorted line is seen as open circuit a 1/4 wave away at the T point so has no affect on SWR.



Feedback from Pete G6KUI...

I've used co-ax traps for many many years, both on RX and TX.

A couple of points.

You really need to use solid dielectric co-ax. If you use semi-air-spaced you will find the electrical quarter wave will vary as you bend the co-ax stub & hence the notch frequency will shift as you bend it.

When I was very active on 70cm ATV, I had to manufacture a whole pile of the stubs for my neighbours TVs. The quarter wave stub plus a patch length of coax were squeezed into one belling-lee(plug) & a belling-lee(socket) on the free end of patch length. Final trimming of the stub done in the shack after assembly. This way the fitting to neighbours TVs was a very simple & quick operation. A very cheap solution to the problems in those days.

On the TX side of things (2M) - I fitted a shorted stub to my 2M linear, it got rid of a horrible 2nd harmonic that the linear was producing.

Why don't U send an interesting bul?

73 De John G8MNY @ GB7CIP