

## Broadband Terminated Vee antenna

Preliminary observations

Article appeared in QST November 1995, (available online to ARRL members).

Is a travelling wave antenna, which has a constant current distribution along its length.

Approx 120ft long with 30ft support pole in centre.

Fed via 9:1 Unun with second 9:1 Unun at far end feeding 50 ohm termination.

A termination resistor at the far end absorbs reflected wave along the antenna

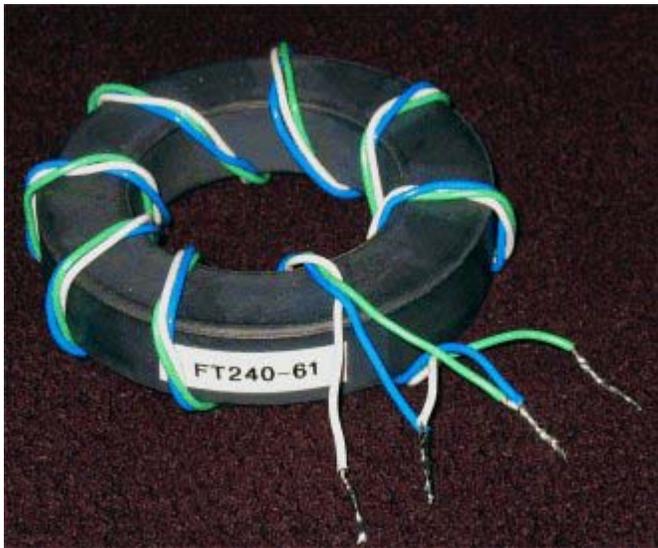
Counterpoise wire running under Vee connects the ground posts at each end.

Some directivity at HF frequencies so can swap feed and load between ends.

Main problem was in constructing 9:1 Unun with correct size wire for windings.

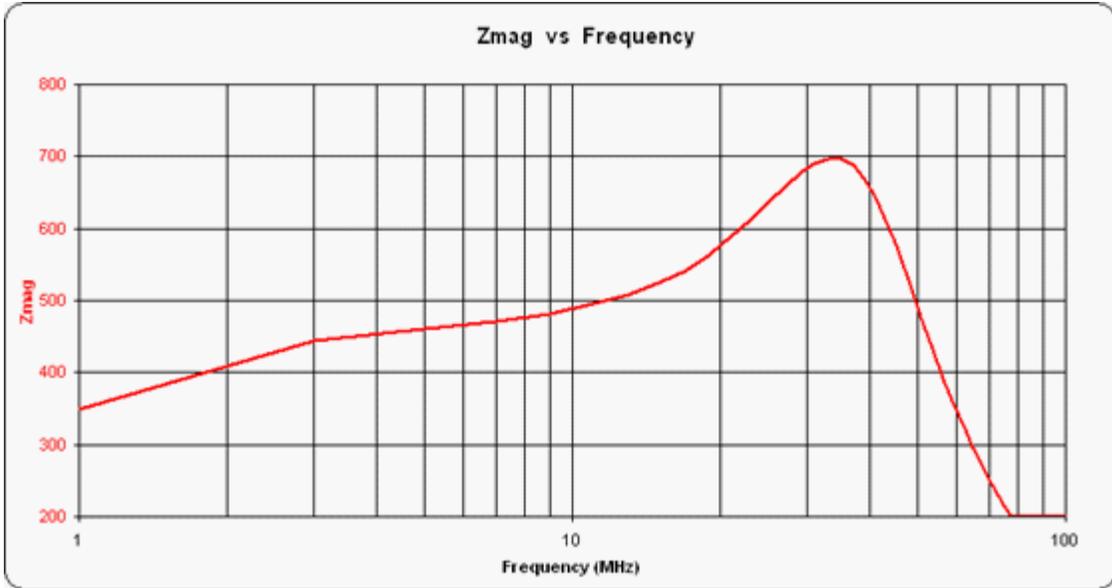
Winding with wrong wire size resulted in poor impedance transformation and high through loss.

Optimised with 8 trifilar turns of 0.6mm dia stranded wire (with 1.2mm outer dia PVC insulation) wound on FT240-61 core.

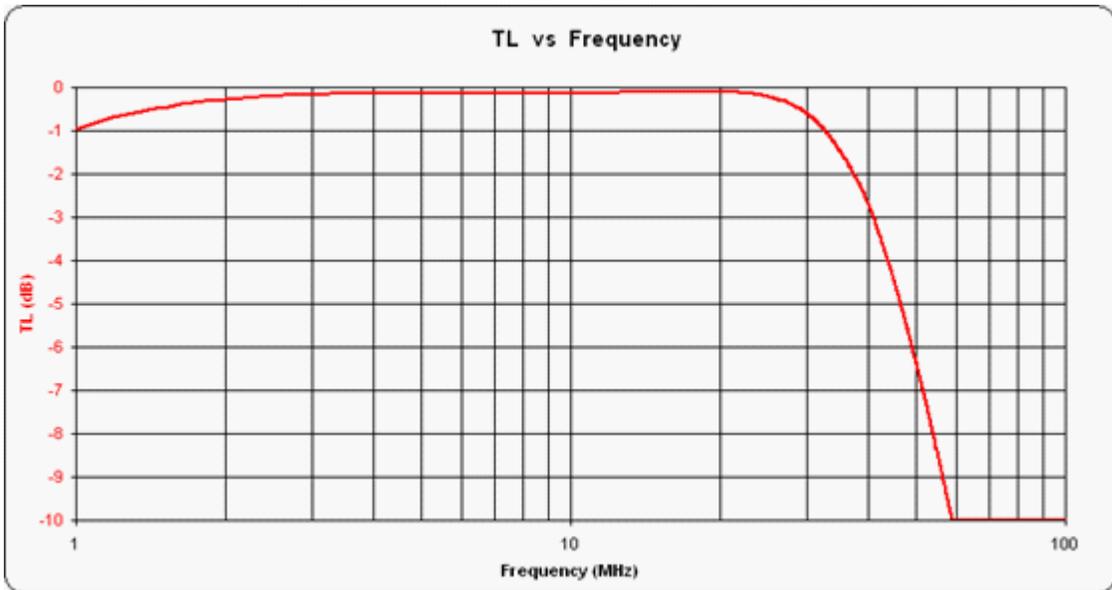


Finally achieved good bandwidth 1.8 to 30MHz with less than 0.5dB loss.

Graph showing 9:1 Unun secondary impedance



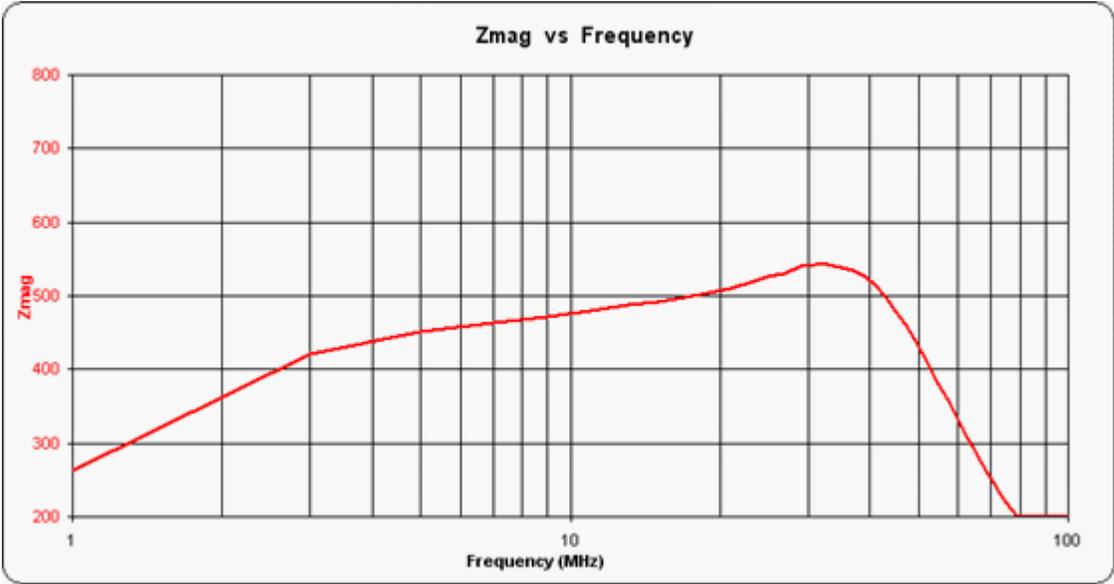
Graph showing 9:1 Unun though loss



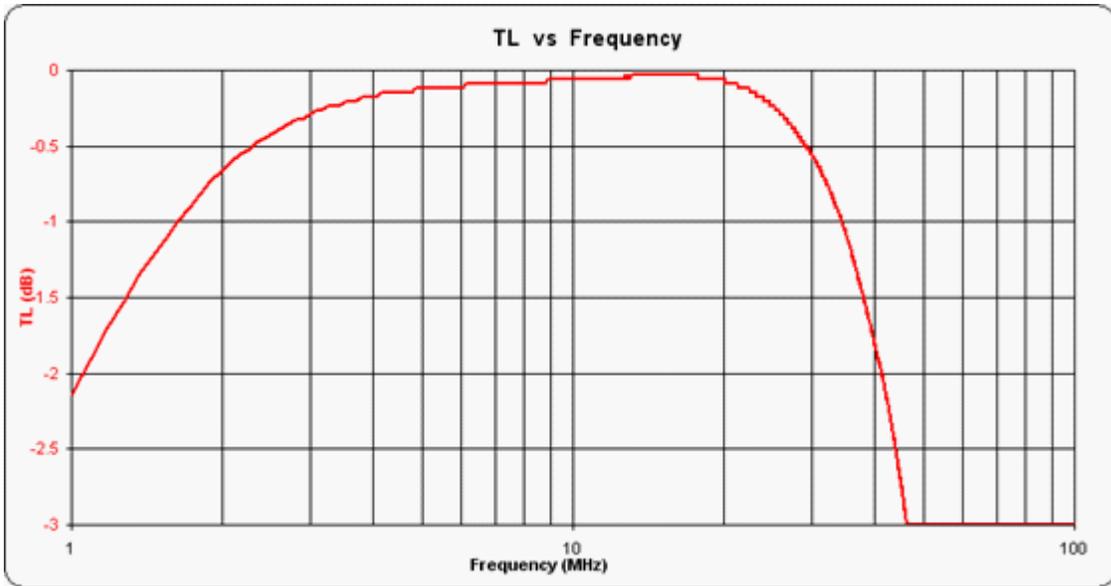
Second attempt at Unun, further optimised with 6 trifilar turns of 18AWG silver plated stranded wire. PTFE insulation, 1.85mm outer dia (CPC part number [CB10433](#)) wound on FT240-61 core.



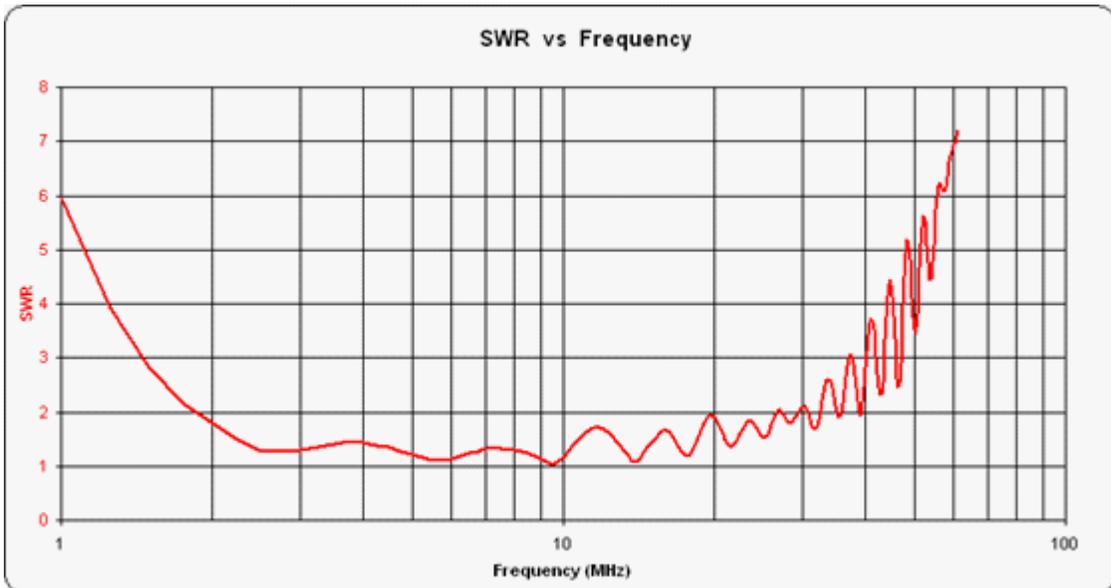
Graph showing 9:1 Unun secondary impedance



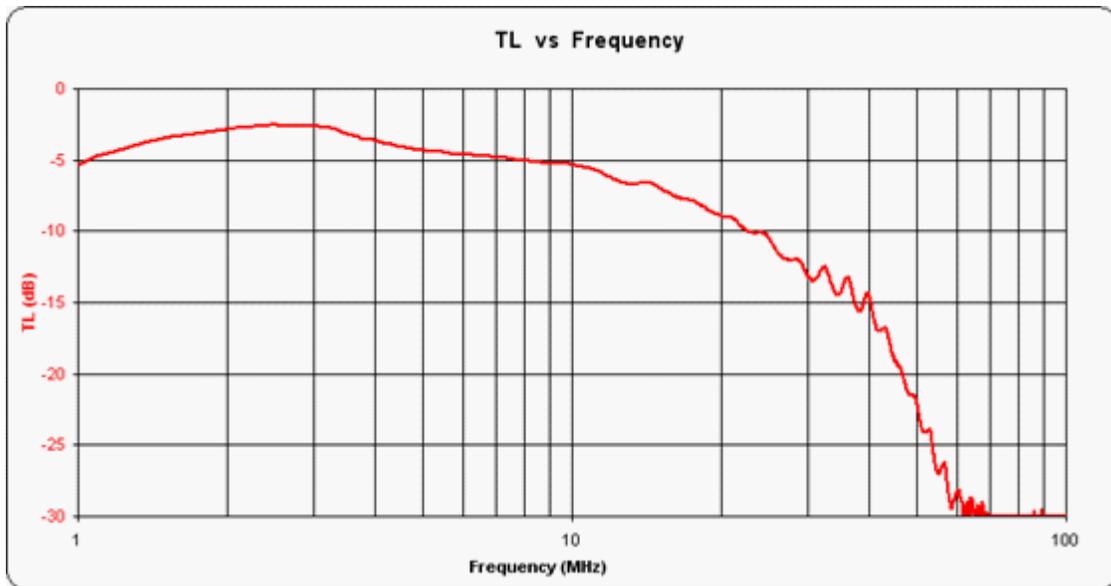
Graph showing 9:1 Unun though loss



Graph showing VSWR at antenna feed point

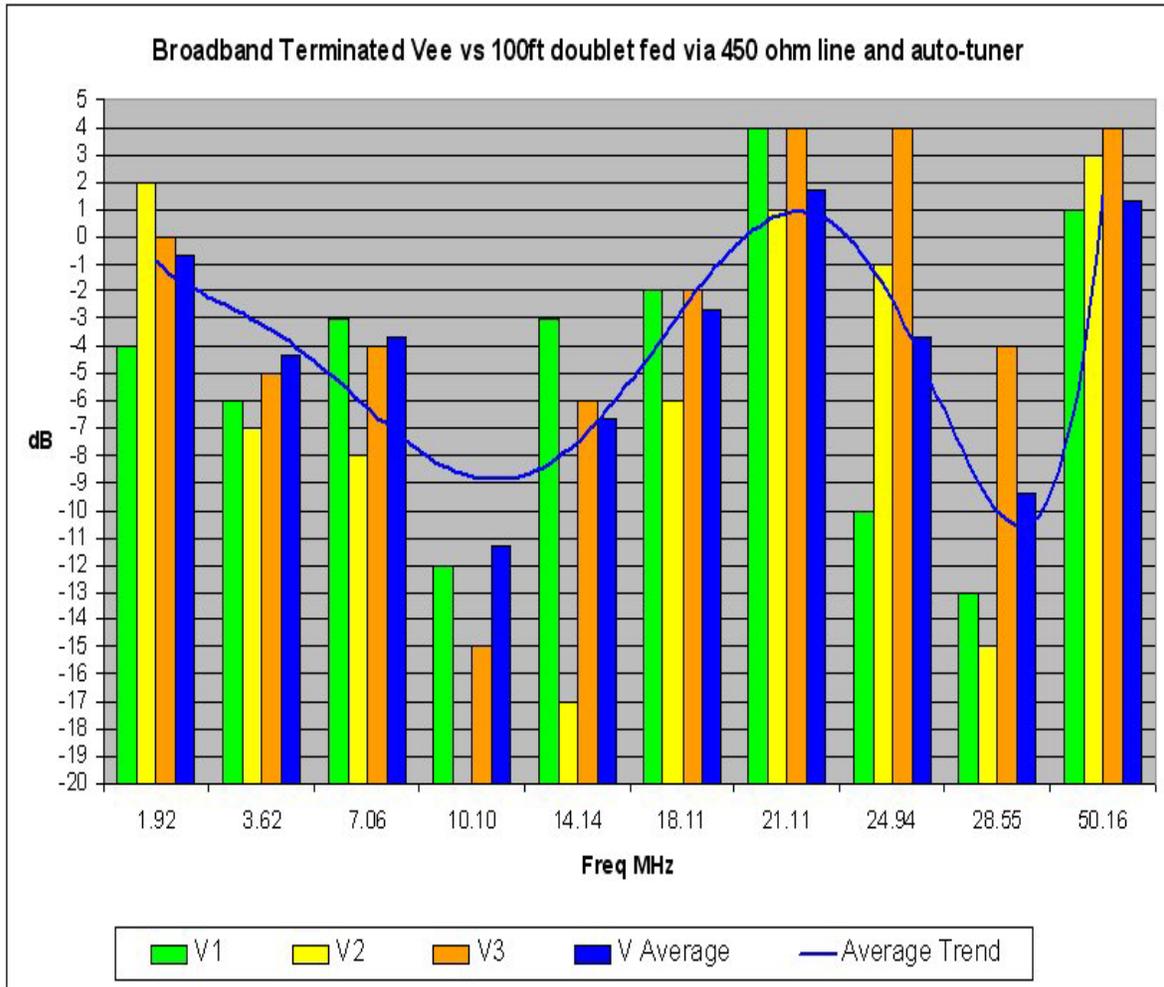


Graph showing power absorbed by termination load relative to input power



I also used the antenna to transmit on each of the Amateur bands between 1.9MHz and 50MHz. I measured the received field strength with a remote controlled Icom PCR-1000 receiver connected to a Datong active antenna. This was located on a building roof approx 20m AGL at approx 2 miles away from the transmit site. I used a 100ft doublet fed via 450 ohm ladder line and matched with a CG-3000 auto-atu at the base as the reference antenna. Note that the directivity of each antenna should be taken into consideration when examining these results. I moved one end of the Vee to three different positions.

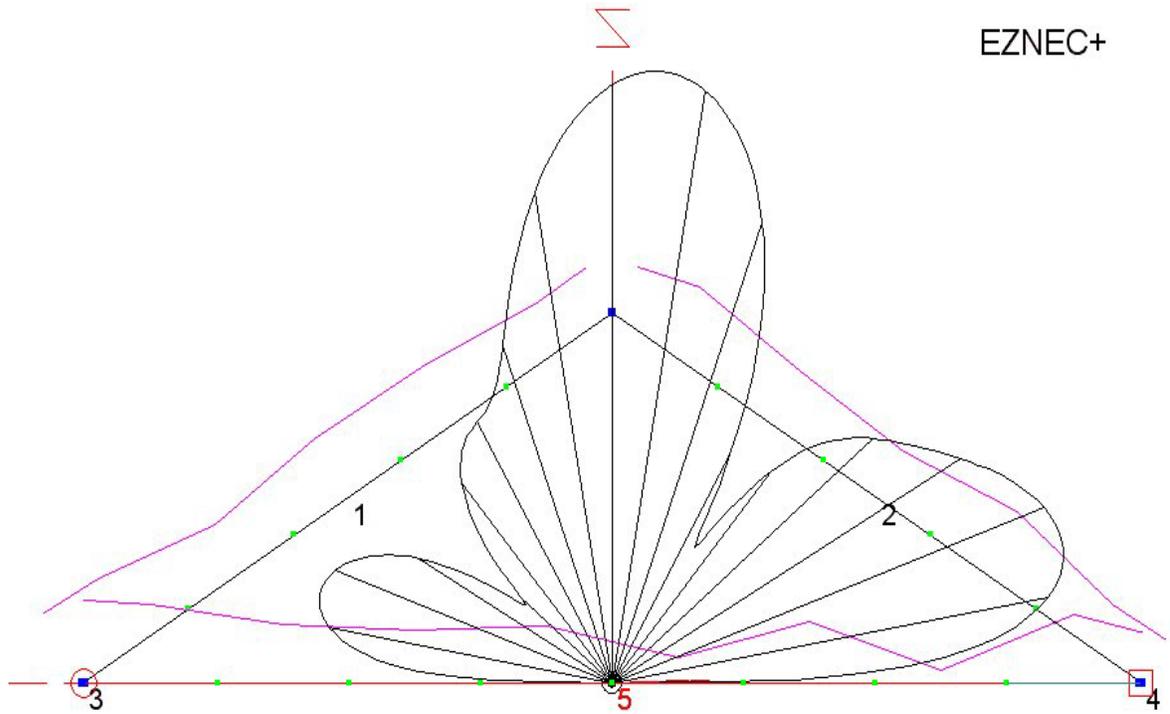
Graph showing gain relative to 100ft doublet



V1 is firing N-S, V2 is reversed firing S-N and V3 is like V1 but with one leg moved 30 degrees in order to try and gauge the directivity of the antenna.

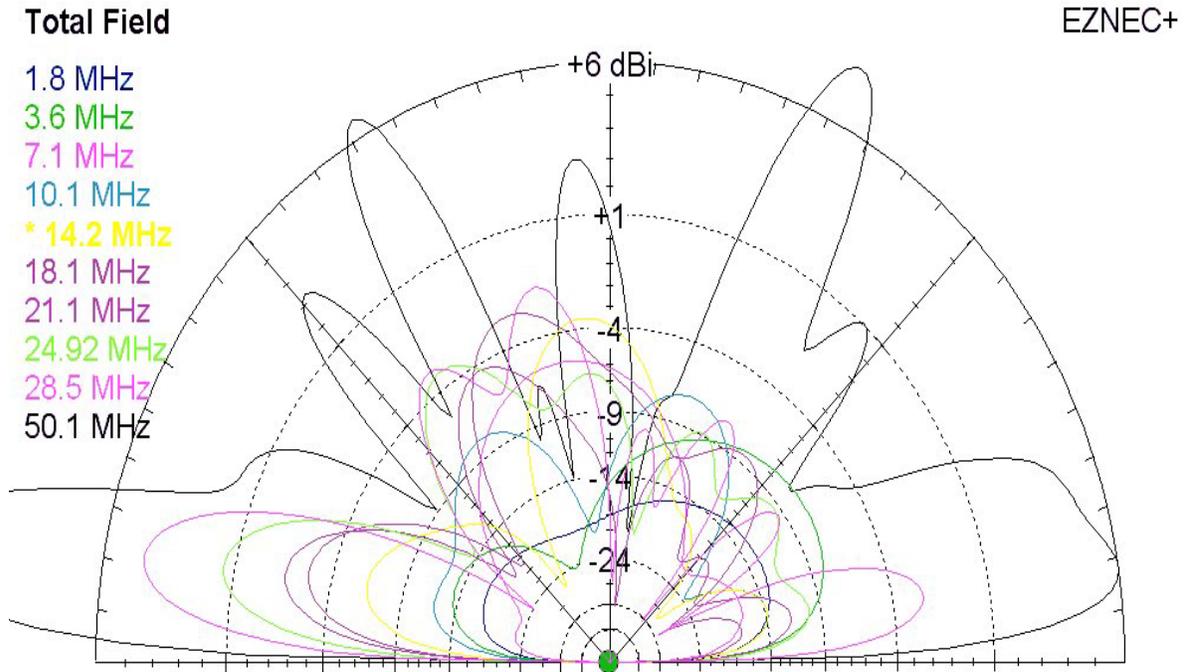
Next some EZNEC modeling

EZNEC plot of pattern at 14.1MHz



Source at point 3 - not very good, I would have expected a much cleaner pattern.

Not too good on any of the other bands either



Further experiments to be tried include modeling as sloping wire

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