

NSH - Tilted V

VHF 2m Antenna

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Generally Hams are using different antennas to get better signals in VHF. They select the popular types from a quarter lambda to a beam yagi) or stacked verticals. Many experienced hams are designing and homebrewing their antennae for their own purposes. Some people are copying the same and begin to make the antennae without reading or understanding the subject properly (PLAGARISM). Moreover they say that it is not working or it is not producing proper gain.

Every antennae have its own chareteristics like gain, take of angle, matching, bandwidth etc. In this article, I am going to explain a 'Tilted-V' for our VHF 2 m band. This design will produce a perfect omni pattern. This antenna is very simple to construct for new commers. These type of V-design is explained by Dean A. Scott in 'Inv Vee Antenna 4ULs REV'. For AIR BAND (www.eaa.org/lightplaneworld/articles/InvVeeAntenna4ULsREV.pdf), The V-Dipole LPDA by W4RNL, hamuniverse.com - 'Cheap and easy to build 2m Antennas' by DON N4UJW and in RSGB, VHF/UHF manual, pages 837-838, it is also given.



Fig. 1. A real view of vertically polarised NSH tilted V

I constructed this antenna by 3/8th thick aluminium tubes and I selected the element spacing angle of 90 degrees (It can be 120 degrees or 60 degrees, but the radiation pattern will change). I fixed this structure on a plexi glass plate of 4" x 4" square and 10 mm thickness. See the photos for reference. I have tested this antenna at a low height of 4 feet inside my QTH. I got VU2KOD repeater as 5-9. The Kodaikanal repeater is around 110 km from my QTH (MK80ht) and with a height of 7,000 ft. My QTH elevation is 300 ft. approximately. When I transmitted to access VU2KOD with the same set up with 25 watts I got report as 5-3 to 5-5. I was much happy in getting such a result by placing my antenna in this low height with so many attenuation inside my QTH.

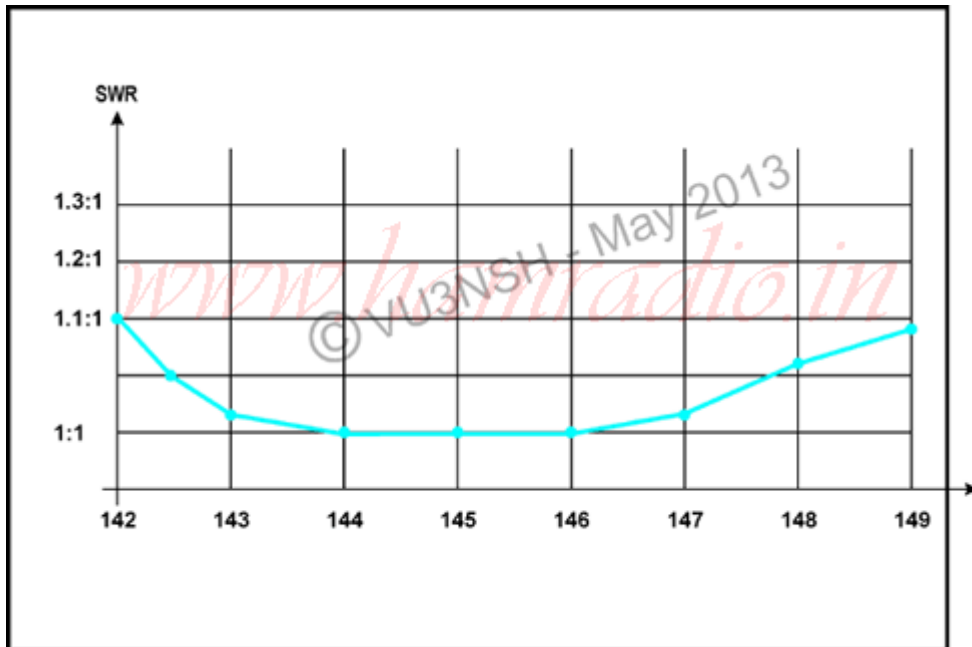


Fig. 2. SWR analysed chart with element length of 47.3 cm

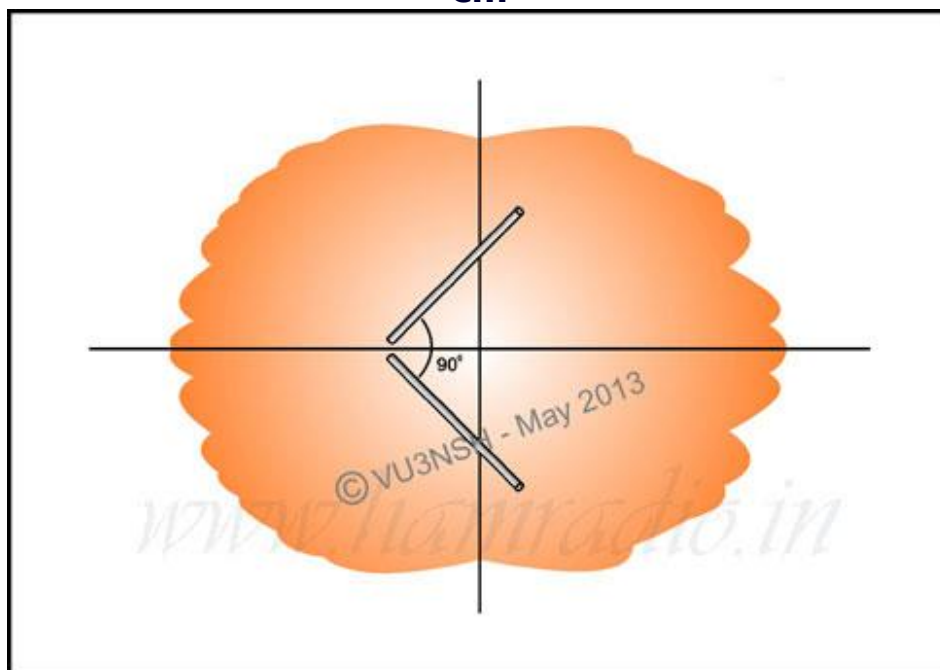


Fig. 3. Omni radiation pattern - Crumpled doughnut shape

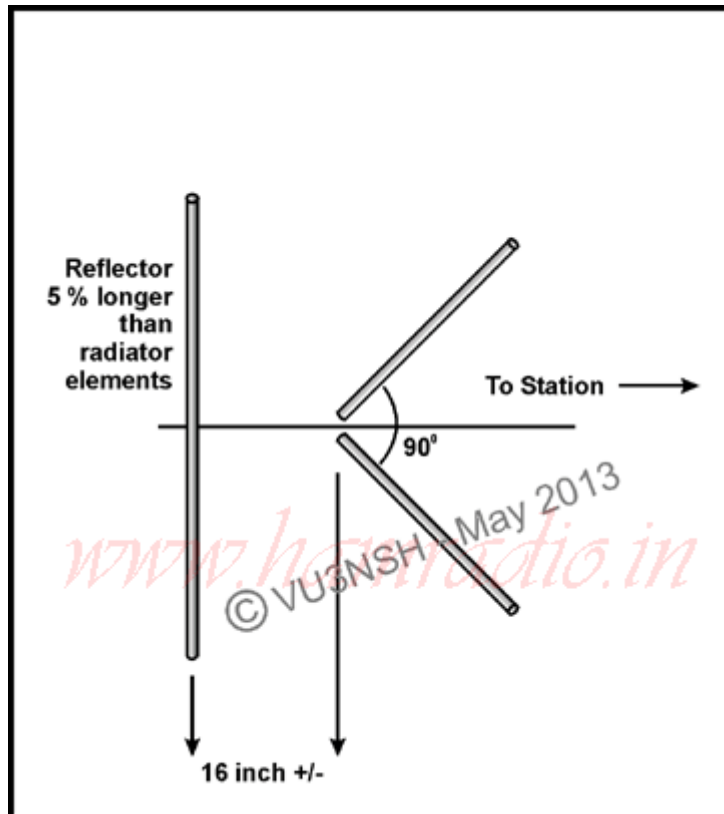


Fig. 4. Tilted V converted as directional antenna

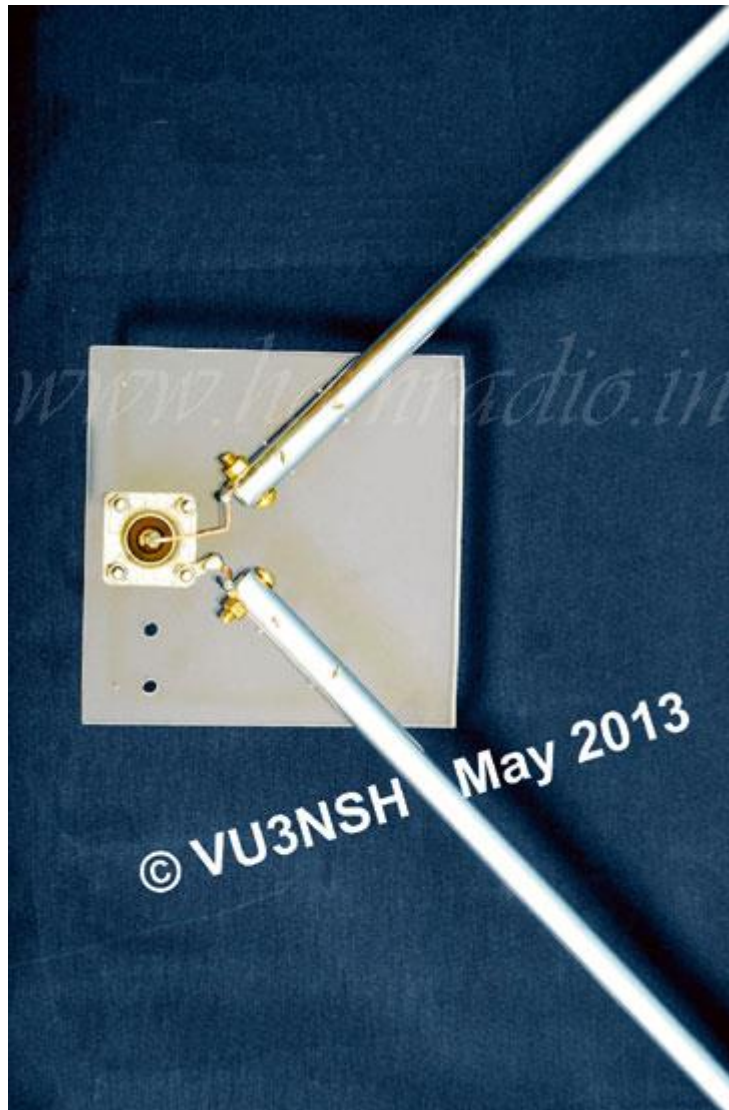


Fig. 5. Feed position section close up view



Fig. 6. RF radiation test by VU3NSH with tilted V antenna

The gain of the antenna is like a dipole and typically it is 2.15 dB (i.e., 1.7 times). It needs bit more Tx power for hooking a very long distant station. When I tested I got the SWR 1:1 in 144 to 146 MHz (Refer the graph given). I have done the mirror polishing to this aluminium element tubes for avoiding the skin effect and associated power loss. The two element length are 47.3 cm for 144-146 MHz frequency.

I observed that this antenna is much useful in moderate height, gracile, simple to construct and very low cost. It will catch all the signals from mine to mount. I have worked with my regular local stations around 10 kms with this low height with low power and I got a report of 5 9 plus. In short, this antenna will graze any angle, any direction and hook the station like a grapnel. Due to its wide angle receiving capacity it is very useful for city dwellers

they are having the space limitation and they can fix it at balcony, window, sunshades etc. Moreover while lightning conditions they can use it as an indoor transmitting antenna. Do not touch the antenna while transmitting. See the radiation photos which is taken by placing the 4 feet fused fluorescent tube near to antenna while transmitting and it will light with 80 % of its brightness. I have given this demo of RF radiation to a number of my friends like VU2EPT, VU2DX, VU2UJE, VU3SYG, SWLs Murali Master, Rejeesh etc. and they are very much excited. So homebrew it and enjoy and know more about this. Radiation pattern of this antenna is like crumbled DOUGHNUT (DONUT), see Torus in Wikipedia.