

# Hentenna - An ADR Antenna

**N. S. Harisankar / VU3NSH**

Hentenna is designed in 1970s by Tadashi Okubo JH1FCZ, Someya JE1DEU. They are 6 meter hams in Japan. In Japan, the word HEN means 'interesting, unusual, strange' etc. Ofcourse, it is a strange antenna and it is an Asymmetrical Double Rectangle (ADR) Loop Antenna. This system has more gain than an ordinary square loop and has the less impedance (nearby 70 ohms). It has two loop sections L1 and L2. The L1 section is the radiator part and the L2 is forming for matching and it helps the low angle radiation (10 to 13 degrees). Refer QST-1982 Feb (by JJ1UMS) and ARRL Antenna compendium vol. 5.

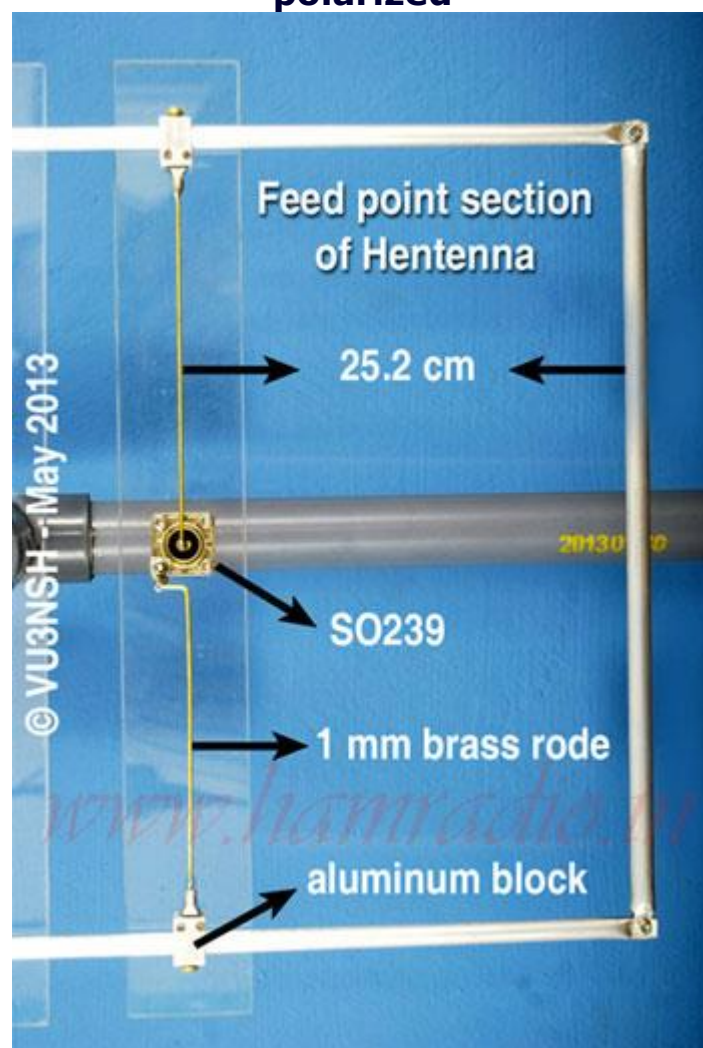
It was described for the first time in QST magazine in February 1982 by Koji Sugihara JJ1UMS (Page No. 16 -17). This antenna will produce a 5.1 dBd gain and with a 1.3:1 SWR with an amazing band width of 6.5 MHz. It can be upto 10 MHz bandwidth with 2:1 SWR. I started this antenna project, for VHF operation, using 3/8<sup>th</sup> aluminium tube and with a fine feed point movable plate section. The plate I have taken was a plexi glass of 15" x 2" and of 6 mm thickness. A SO239 socket was fixed at the centre of this plate for the cable connectivity (Refer photographs). Both ends of the feeds are connected with the 12 mm x 12 mm and 20mm long aluminium solid blocks with screw fixing holes. A 1 mm brass rod is used to connect the above block sections to the SO239 socket, as a feed line.

The Hentenna Asymmetric size combinations are ' $\lambda$  by 2', ' $\lambda$  by 6' rectangle and feed point is ' $\lambda$  by 10' approximately. This antenna is not an omni and it is a bidirectional type. The HEN Part (Strange or Interesting) is as follows; If this antenna is fixed horizontally then it will produce a vertical polarisation !!! If it is fixed vertically the polarisation will be in horizontal. This character is explained by F.C.Judd (G2BCX) in 2 m antenna handbook in the 'stacked skeleton slot array' (page number 89-92). i.e., "The vertical slot is horizontally polarised and vice versa". The skeleton slot system was

developed by B Sykes - G2HCG of J-Beams Ltd. The radiation pattern is just like peanut shell.

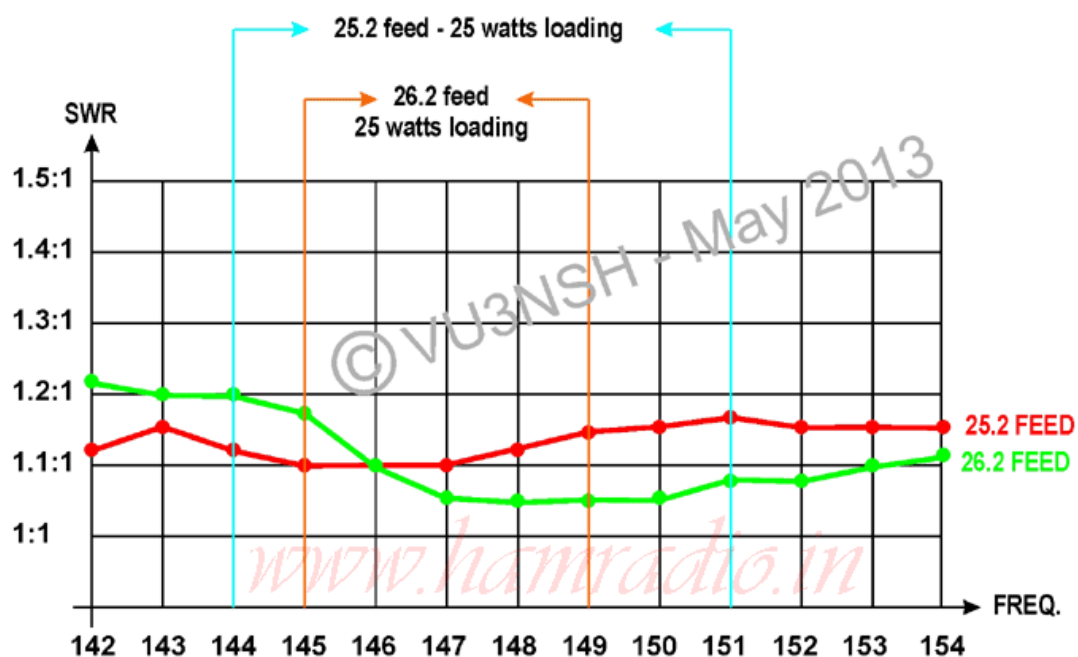


**Fig. 1. Hentenna - Horizontally mounted vertically polarized**

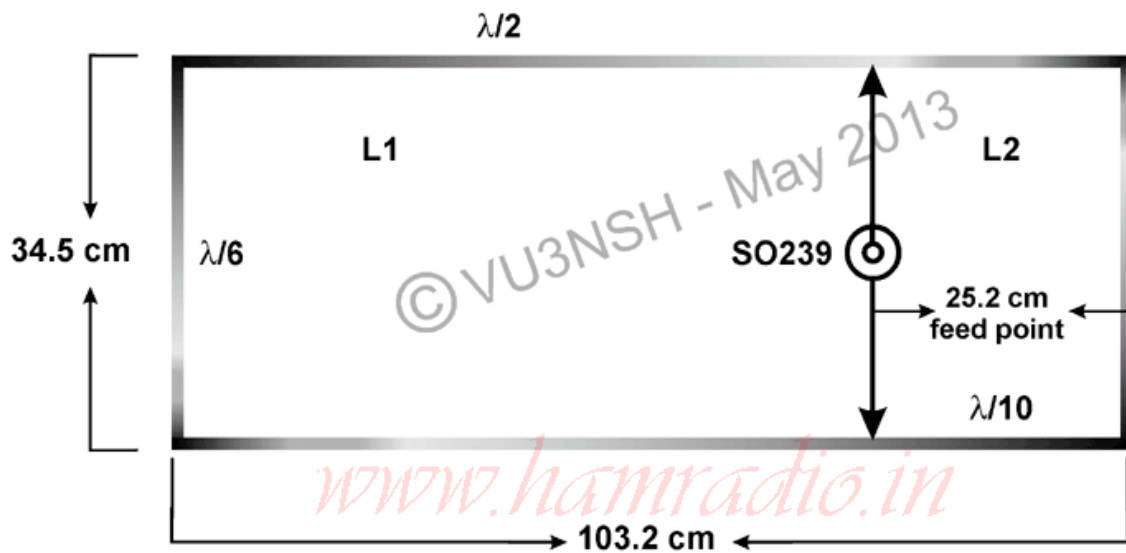


**Fig. 2. Feed point section of hentenna**

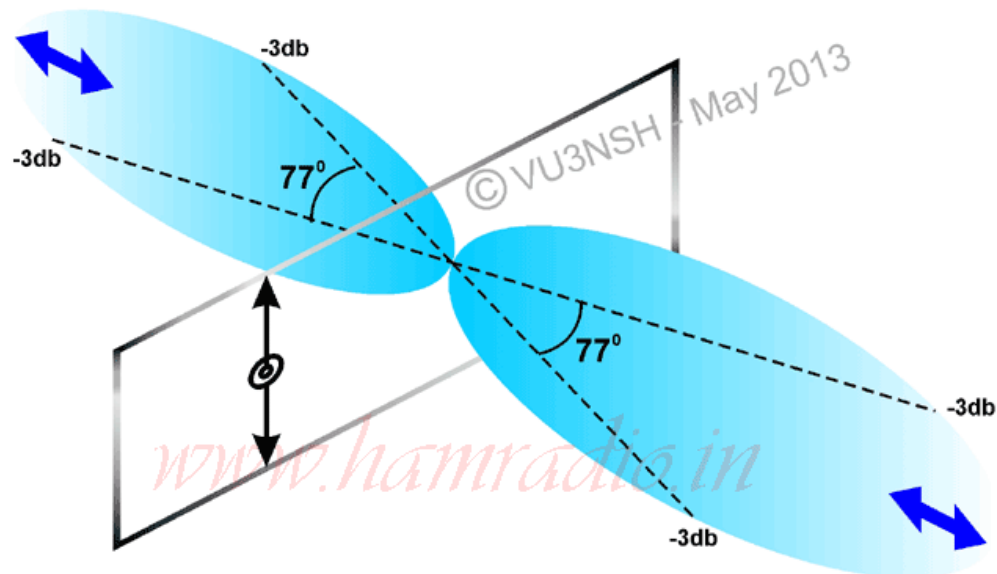
When firing the antenna for the first time with the SWR meter, I fixed the movable section to 'lambda by 10' approximately, then I moved it up and down and took the readings (see the SWR graph given below). Then I changed the feed point to get a very low SWR with low and high power. I got a beautiful match at 25 cm from inner surface of the right side tube (element - loop 2) and this point gives a 6.5 MHz bandwidth with a low SWR of 1.2:1 !!! at a low height of 4 feet inside my QTH, I got VU2KOD repeater as 5 5 and 5 6 and all local stations around 10 kms. as 5 9 plus 20 dB. I done this project three months back with a search of unusual antennas. For testing and assembling this antenna my SWL Rejeesh also helped a lot. Make this bi-directional asymmetric double rectangle loop antenna and enjoy...



**Fig. 3. Hentenna - SWR analysed chart**



**Fig. 4. Measurements for 145MHz (2m), vertically polarised Hentenna**



**Fig. 5. Bidirectional radiation pattern of vertically polarised 145 MHz hentenna**