

Vertical Antenna for the 20-, 15-, 10-m Bands. (Antenna UW4HW)

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Classical Vertical Antenna (aka **Ground Plane Antenna**) without additional tuning works satisfactory only at one amateur band. However, so called “thick” antennas (looks like three-dimensional geometrical figure) could work with good SWR in the frequencies range $F1/F2= 3$, where, F1- high working frequency, F2- lower working frequency. Common use those ones is a Conical Antenna (**Figure 1**) and Exponential Antenna (**Figure 2**).

For Conical Antenna the pass- band is increased with the increasing of the Alfa at the antenna base. Antenna has optimum parameters at Alfa = 60... 70- degree. At the Alfa = 60... 70- degree the Conical Antenna has impedance near 70- 80- Ohm. The same thing is for Exponential Antenna. However, the maximum diameter of the Exponential Antenna is almost in three times less compared to the Conical Antenna.

As usual the antennas shown on **Figure 1** and **Figure 2** made from wires or tubes to simulate the Conical or Exponential shape.



Radio # 12, 1968. Cover.

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МНОГОДИАПАЗОННАЯ ВЕРТИКАЛЬНАЯ АНТЕННА

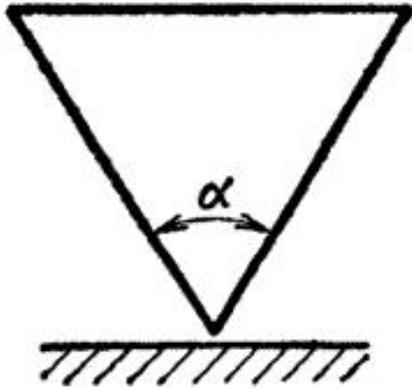


Figure 1 Conical Antenna

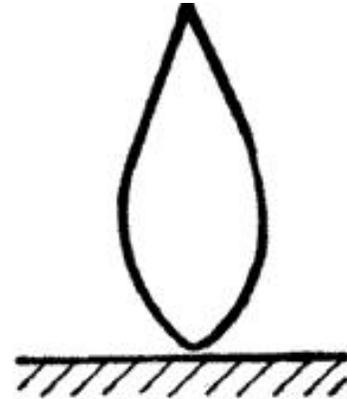


Figure 2 Exponential Antenna

Antenna is fed by a 75- Ohm coaxial cable. Central core of the cable is turned on to the antenna wires. Braid of the coaxial cable is turned on to the antenna's ground. It is possible to use a metal roof as antenna ground. Six wires in length equal to the length of the antenna side may be used as antenna ground. The wires are placed perpendicularly to the antenna mast.

Copper wire in diameter of 1.5-mm (AWG 15) was used to make the antenna and the ground. SWR of the antenna was from 1.2:1.0 to 1.9:1.0 at the working bands. It is possible to make the antenna for other frequencies bands. Length of the antenna wires (from the bottom to top) may be found at the below shown **Formula** (it is for Alfa = 60... 70- degree).

$$(0,24 - 0,28) \lambda_{min}$$

The antenna worked very well in the practical operation in the Air.

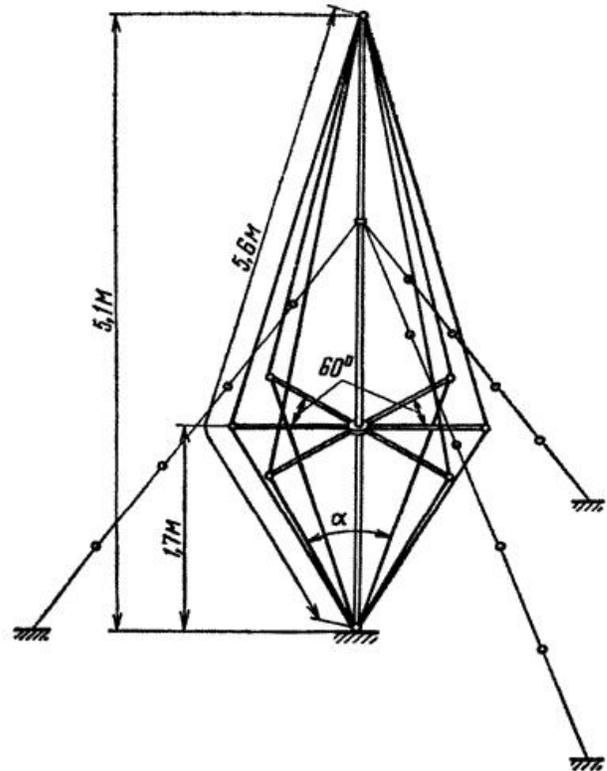


Figure 3 Exponential Antenna for the 20-, 15-, and 10-meter Bands



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