Top Fed Five Band Vertical Antenna

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Credit Line: Radio #1, 1984, p.24

It is a simple solution increase the efficiency of a vertical antenna. Just to remove all high currents parts of the antenna from ground. The losses at nearby subjects are decrease and the overall performance of the antenna increase. So, we come to a Top Fed Vertical Antenna.

Figure 1 shows one band Top Fed Vertical Antenna. Upper horizon part of the antenna stretched with help of a fishing rope by 1.0-mm in diameter.

To the middle of the horizon wire the inner conductor of the coaxial cable is connected. The outer sheath of the coaxial is unconnected. Coaxial cable is going straight down or with some angle to the horizon wire. An RF-Choke is installed at the distance lambda/4 from the top end of the coaxil. The RF-Choke made like a resonant LC-circuit. The circuit has resonant at the working frequency of the antenna.

RF- Choke practically made by coiling around of one side of a ferrite ring (having low losses at HF) with large OD/ID one or two turns by the antenna coaxial cable. A Resonance Coil coiled at another side of the ring. The circuit (coil and bridged to it capacitor) has resonance at the working frequency.

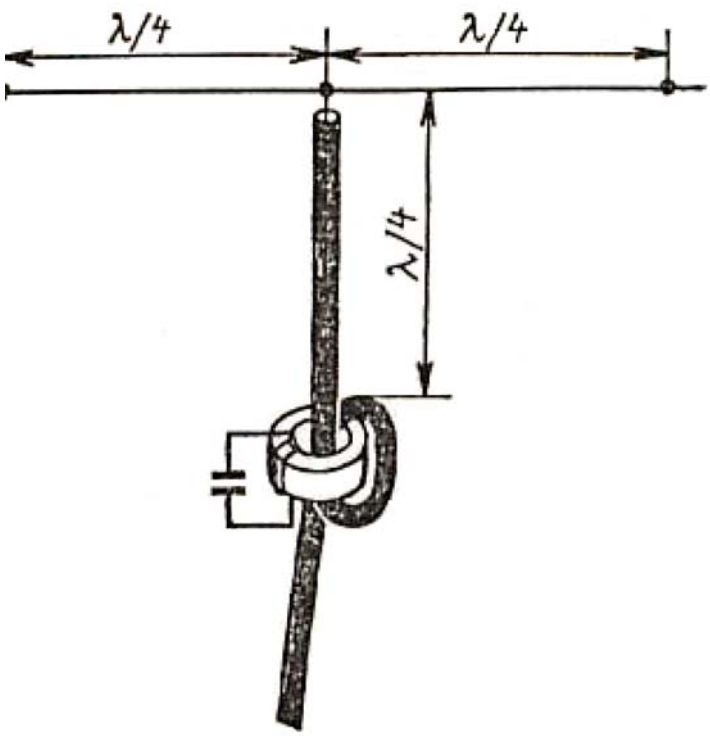

Figure 1 One band Top Fed Vertical Antenna

The Choke may be made without a ferrite ring. Choke looks like two- three large turns of wire in 2-4- mm in diameter bridged to capacitor. Coaxial cable in the needed place does one turn around the coil. The coax and the coil are tight by a Scotch. Capacitor should have high Q and high working voltage. TX with 100- Wtts output power may induce across the capacitor 400-500- V RF.

Data (approximately) for the Choke (made by wire in 2-mm in diameter) are given in **Table 1**.

The Choke does not influence to the coaxial going below the Choke. Below the Choke coaxial (any length) may go in any way- lay on the ground or roof, go near a home wall, etc.

It is very possible to create a multi- band Top Fed Choke Antenna. Use vertical wires that have resonance for each band and just place at needed places on to coaxial cable the special resonance Chokes. **Figure 2** shows the schematic for 5-band Top Fed Choke Antenna.

Table 1 Data for Loop Choke

Band, MHz	Numbers of turns	Length of the wire, cm	C, PF	Q
7	3	160	150	260
14	2	115	68	230
21	2	80	47	210
28	2	60	36	265

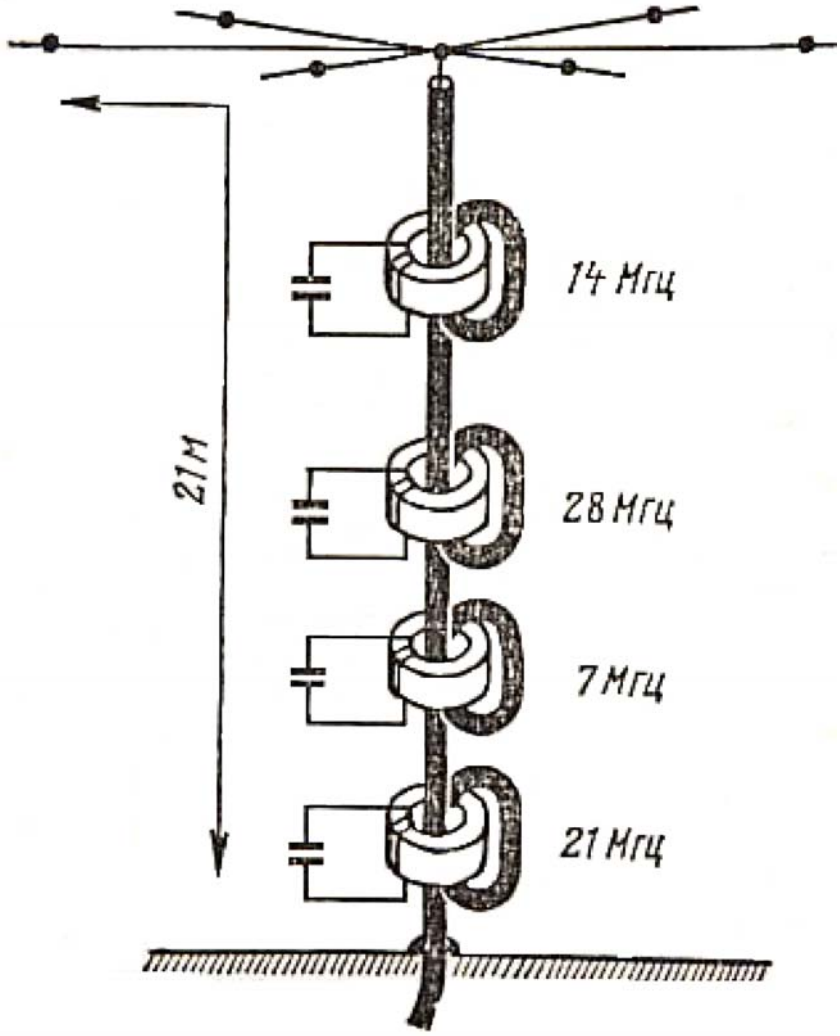

Figure 2 Top Fed Five Band Antenna

Horizon part of the antenna has three pair wires in length 10- m (for 7 and 21- MHz), 5- meters (for 14- MHz), 2.5- meters (for 28- MHz). Chokes are placed (from the Top End): 7.5- meters for 28- MHz, 3.5 or 10.5- meters for 21- MHz, 5- meters for 14- MHz, 10- meters for 7- MHz. The sizes are approximately and should be corrected at antenna tuning.

For band 3.5- MHz the outer sheath of the coaxial is grounded to the ground after last Choke.

The distance is approximately and should be corrected at antenna tuning. It is possible to tune the antenna at 3.5- MHz by the coil or capacity that is switching on between the outer sheath of the coaxial and the ground.

The input impedance of the antenna at the bands 7- 14- 21- 28- MHz is close to 50- Ohm. The input impedance of the antenna at the band of 3.5- MHz is close to 100- Ohm.