Dipole Antenna for the 50-MHz Band

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Every radio amateur wants fill up any free space by an antenna. Not nearly enough antennas! So as I found a free space where I can install an antenna. True, it was a small place where I could install a small antenna. I choose a dipole antenna for 6 meter Band. It was because the diagram of directivity of the new antenna will be seen to line East- West. My old 6 meter dipole antenna had the diagram of directivity that seen to line South- North.

Of course, a simple dipole antenna is not a big gun. However, as I noticed in practice, the direction of even such simple antenna plays the role. The ham radio stations on the 6 meter Band, which were heard by me enough loud, all of them lay on the line South- North.

Another reason was the coming ARRL September VHF Contest. At the last ARRL Spring VHF Contest almost all stations in my log were from the line South- North. I hope add the line East- West at the coming contest. In general, the design of a dipole antenna is very simple. **Figure 1** shows a dipole antenna for 6 meter Band.

But the simplicity is only on the picture. In practice, it is necessary to make a central insulator, it is necessary to take into account the length of the wire in the center and ends insulators, it is necessary to take into account the shortening factor of the wire in the plastic insulation that was used for the antenna.

For the central insulator I decided to use a nylon dog bone insulator. **Figure 2** shows the insulator and SO-239 connector. In the middle of the insulator I cut a square place for installation of the SO- 239 connector. In the center of the insulator it was made hole for wire going to the center wire of the SO- 239 connector. The connector was fixed to the insulator with help of two screws. Holes for the screw were drilled in the insulator. **Figure 3** shows the SO- 239 connector mounted on the insulator and the antenna wire connected to the SO- 239 connector. The holes and places where the connector mounted on the insulator were protected with weather proof automotive epoxy (I have bought the epoxy several years ago in Canadian Tire store). I used Egg insulators for ends of the antenna. **Figure 4** shows these isolators at the end of the antenna.

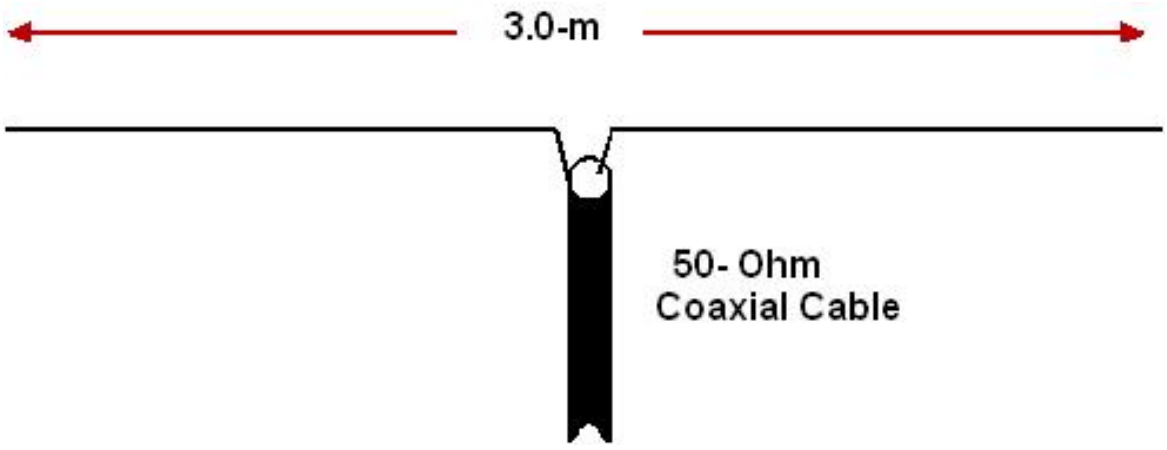

Figure 1 Dipole Antenna for 6- meter Band

Figure 2 Dog Bone Insulator with SO- 239 Connector

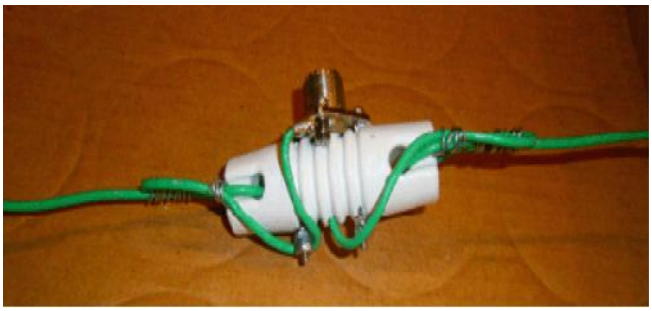

Figure 3 Connector Mounted on Dog Bone Insulator and Antenna Wire Connected to SO- 239 Connector

Figure 4 Egg Insulator at the End of the Antenna

Let's discuss the practical implementation of the antenna. Before tuning, each side of the dipole had 160 centimeters of wire. The antenna was installed at height of 2 meters above the ground for the tuning. By symmetrically shortening the sides of the antenna, this antenna was tuned to minimum SWR at the frequency of 50.1- MHz. The SWR and input impedance was measured by MFJ- 259B. The device was connected directly to the antenna. At the resonant frequency of 50.1- MHz the antenna had input impedance of 75- Ohm that is the theoretical one. **Figure 5** shows the final dimensions of the antenna tuned to 50.1- MHz.

Connection of the feeding coaxial cable to the SO- 239 connector was protected with Coax-Seal tape. A 100 feet long RG- 8 coaxial cable was used to run from the antenna to transceiver. **Figure 6** shows the center insulator with connected feeding coaxial cable. The antenna was installed in a sloping position, the lower end of the antenna was at the height of 2 meters from the ground the upper end of the antenna was at the height of 4 meters from the ground. **Figure 7** shows the antenna at its location.

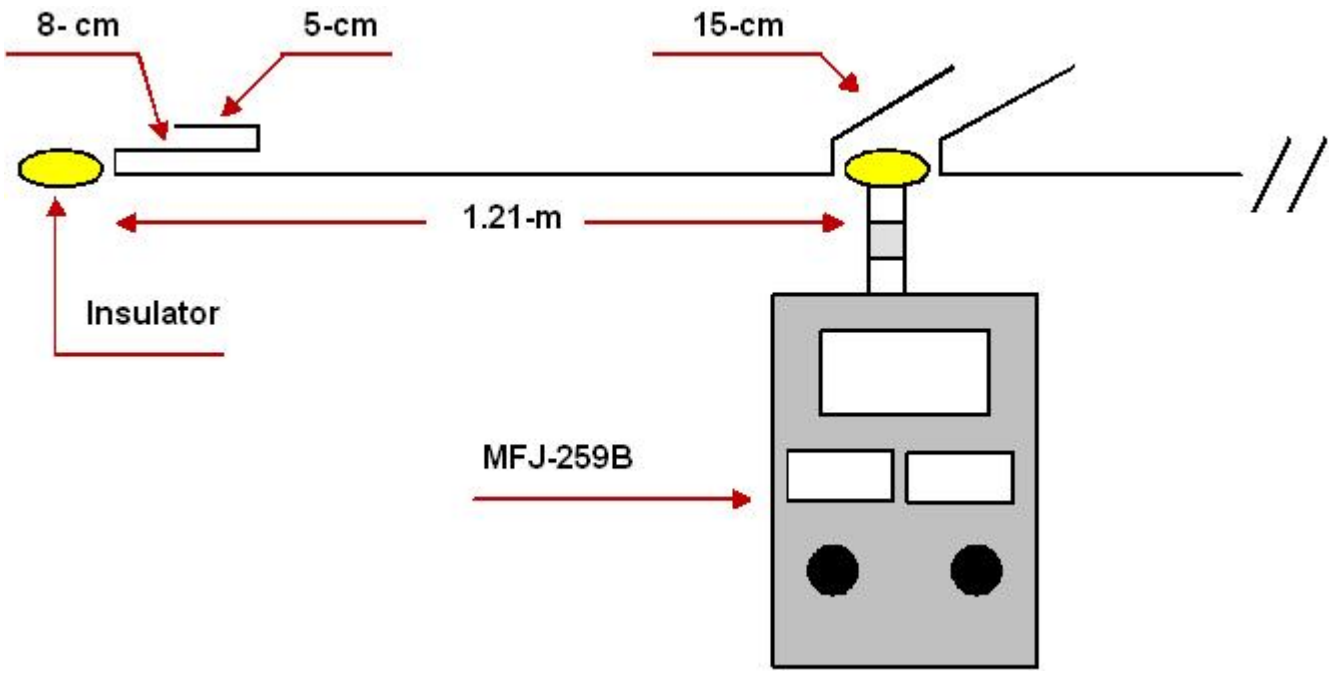

Figure 5 Dimensions of Antenna Tuned to 50.1- MHz

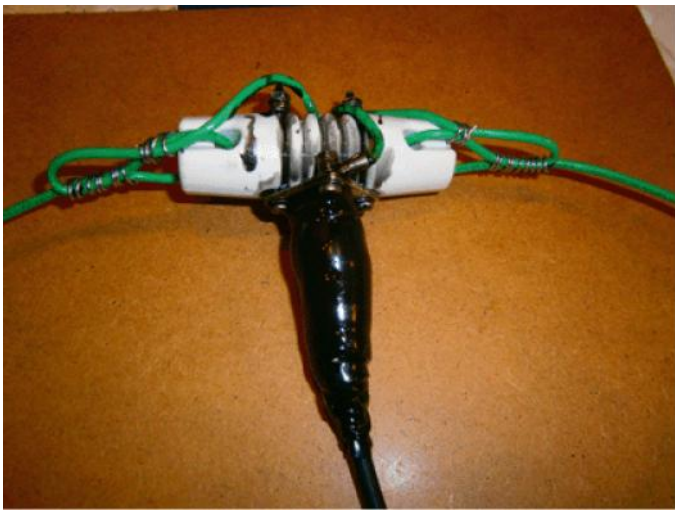

Figure 6 Center Insulator with Coaxial Cable

Parameters of the antenna were measured in the shack with help of MFJ- 259 and with help of MICRONTA SWR meter. The SWR meter was calibrated before the measurement. After installing the antenna in its place, the antenna parameters were measured with the help of the device and with the help of the SWR meter. **Table 1** shows the antenna parameters measured with the MFJ- 259.

Table 2 shows the antenna parameters measured with the calibrated SWR meter. As you can see data from MFJ- 259B not matched to data that the MICRONTA SWR meter shows. It may be lots different reasons- main of them is the some RF that MFJ- 259 pick-up through long coaxial cable. As well antennas for 50- MHz band as usual works good at 144- MHz band- it is third harmonic. **Table 3** shows the antenna parameters of the antenna at 144- MHz band measured with the MFJ- 259.

Figure 7 Antenna in the Place of Installation

Table 1 Antenna Parameters at 50- MHz band Measured with the MFJ- 259

F, MHz	50.0	50.100	50.180	50.450	50.560	51.0	52.0
R +X	67+18	75+10	79+0	80+0	14	42+22	29+8
SWR	1.5	1.5	1.5	1.5	1.5	1.6	1.8

Table 2 Antenna Parameters at 50- MHz band Measured with the MICRONTA SWR Meter

F, MHz	50.0	50.1	50.2	50.4	50.5	50.7	51.2
SWR	1.3	1.3	1.3	1.2	1.0	1.0	1.1

Table 3 Antenna Parameters of the antenna at 144- MHz band measured with the MFJ- 259

F, MHz	140.0	141.0	142.0	142.5	143.0	144.0	145.0
R +X	32+10	57+25	61+6	46+6	42+6	57+13	57+7
SWR	1.7	1.6	1.2	1.1	1.1	1.3	1.2

Originally the two antennas were tested by receiving of the Beacons (propagation permitted!). It was noticed fairly clear difference in the direction of the antennas. However the major test what I waiting for was waiting for me the ARRL September VHF Contest. 11 September 2021 and 12 September 2021 - at the days it was no any propagation at the 6- meter band. No any beacons, no any stations…

Everyone who uses the band knows that at propagation the amateur stations and beacons are very loud. But it was not on the September' days of the 2021… No any propagation… Just loud roaring from the solar flare of the geomagnetic storm… Will wait for the next propagation to test the antennas.

73! de VA3ZNW