

Efficient Field Low Height Dipole Antenna for the 20- meter Band

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Credit Line: <http://www.hamradio.cmw.ru/antenna/upa14.htm>

The antenna was designed for using in a mountain hiking where the main requirement is a low weight and high efficiency at the limited stuff around there.

Field test shows that the antenna has almost circle diagram directivity.

Why symmetrical dipole antenna?

Symmetrical dipole antenna is mostly fitted for the field conditions. Military, geologist expedition, rescue and emergency communication service- all of these are used a dipole antenna. The antenna works well in the near zone (100- 200- 300- km, depends on the Band) that is needed for communication from a mounting trip. It is important that the antenna would have some gain because in the mountain it is used a QRP-equipment. Dipole antenna works well in the forest, in the deep ravine, among tents in Alpinist Camp. **Figure 1** shows design of the dipole antenna. The antenna has gain plus 5- dBi.

Antenna Design

The antenna is a symmetrical dipole (with length a little bit more the $\lambda/4$) installed on the top of a plastic fishing pole. The antenna is fed by a 50- Ohm coaxial cable. The cable is matching with the antenna with the help of two fixed capacitors. One is connected to the central core another one is connected to the braid of the coaxial cable. The value of the capacitors (50- 200- pF) should be found out for the current antenna system. Coaxial cable at the feeding terminal is coiled (2- 3 turns) on to a ferrite ring. Capacitors and the ferrite ring should be protected from moisture. Those ones may be placed into a plastic box (from an old 35- mm film) or shrinked.

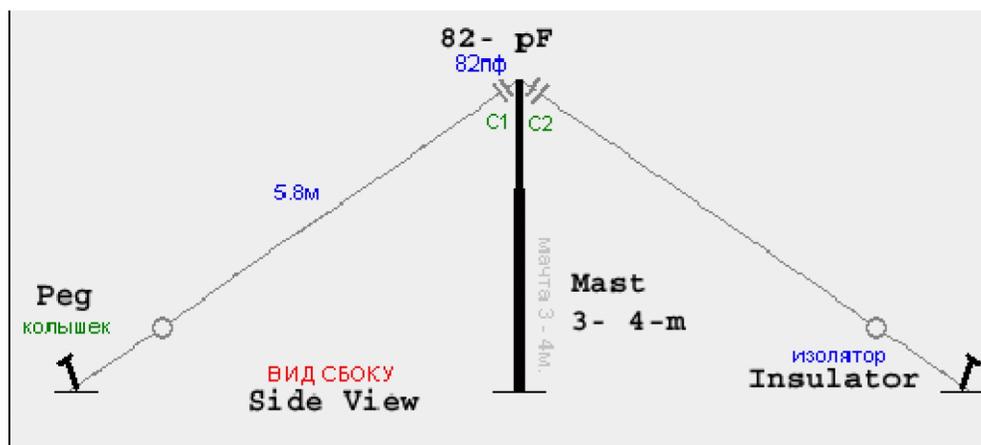


Figure 1 Field Dipole Antenna



Antenna in the mountains



Capacitors in the Film Box



Matching Box on the Antenna

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Stability of the mast of the antenna is provided by on a guy and two antenna wires that are used like two guys.

Three long screwdrivers are used like a peg for the guys. **Figure 2** shows installation of the mast of the antenna.

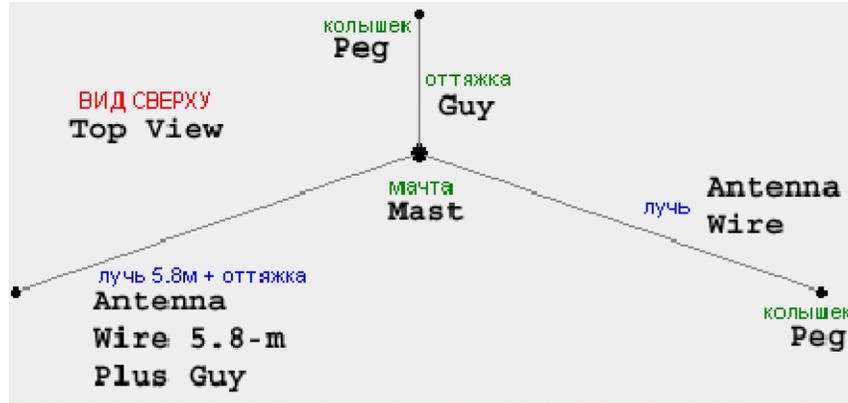


Figure 2 Installation of the Mast of the Antenna



Antenna End Connection with a Guy



Fastened the Guy at the Ground

Tuning of the Antenna

Install the antenna according to the **Figure 2**. Angle between the antenna wires should be near 130-degree. Length of the each wire is 6.0- meter. Turn on the coaxial cable to a MFJ- 259 or to SWR-meter plus Transceiver.

Conclusion

The antenna was tested in my mountain trips. It is showed good result. I am strongly recommended the antenna for one- day field operation as well as for several- days mountain trip. Antenna may be designed as for one band either for several operation bands.

Do shortening the wires by length of the 10- cm by low SWR. Sometimes it needs to change value of the capacitors to reach the low SWR. As usual it is possible to get SWR 1.0:1.0.

Multi Band Version of the Antenna

The Antenna may be made in a multi band version. For the version antenna wires are broken into lengths that would be resonance for the desire bands. Shortening capacitor may be the same for all of the bands. Turning on of the next band is provided with the help of the jumper. **Figure 3** shows the multi band antenna. Tuning of the antenna begin from the upper band and sequentially is going to the next lower band.



Unpacked Antenna Ready to Installation

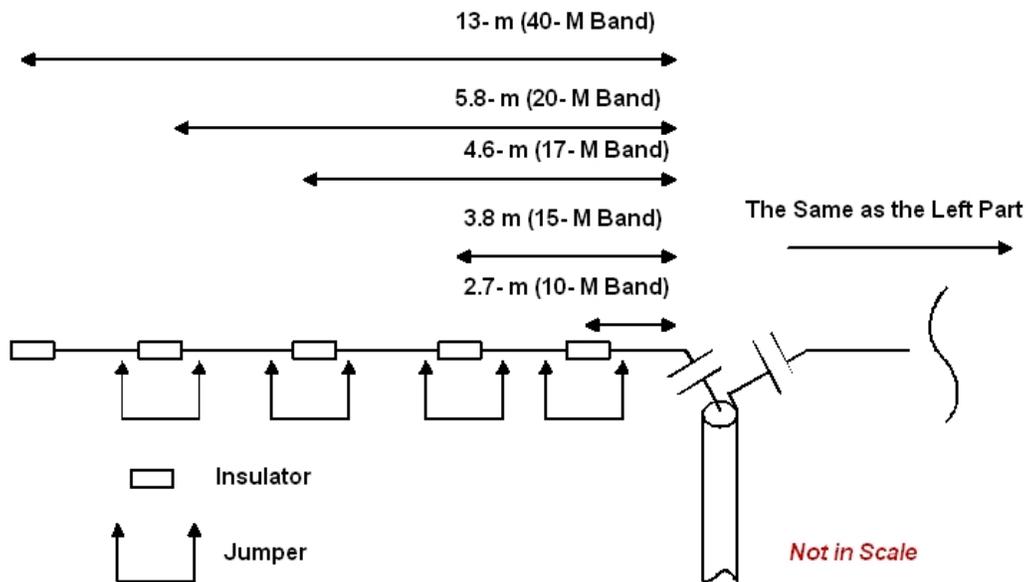


Figure 3 Multiband Field Antenna

73! UA6HJQ