

Low Profile Antenna for the 30, 20, 17, 15, 10 and 6- meter Bands

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In the summer 2017, when the winter with winds and ice storm was far away, I decided to install a Low Profile wind and ice rain resistant antenna. Why I decided do this? There were some important reasons. My Beverage Antenna was remade. Now the antenna wire was not going along wooden fence but hang upped in the space.

About the antenna:

http://www.antentop.org/021/Two_Wires_Beverage_Antenna_021.htm

Efficiency of the antenna is grown up but reliability went down. Canadian winter with strong winds and ice rain may very make my Beverage antenna down. So I need weather proof antenna in case if the Beverage antenna cannot stand the winter. Before I will give the description of the Low profile weather proof antenna, I want to say that the Beverage Antenna with honor has stand sever Canadian winter. However it was a small incident with the antenna in rainy autumn. The antenna was dropped down during CQ WW DX Contest.

The reason of this incident was home- made antenna insulator. The insulator was made from a thick plastic tube. **Figure 1** shows design of the insulator. It is a very simple design. I used tens such insulators in my antenna design.

However, inside the tube opening, as I guess, some dust and water were penetrated, that then created a conductive channel between antenna and a guy (made from a copper wire in plastic insulation) that seems to have a resonant in the 15 meter band where I was operated in that time.

Insulator was melted and insulation on the guy as well was melted. It was happened at the power of my transceiver 90 W. Antenna was restored with help of commercial made high quality insulators.

After visual inspection of my Beverage antenna I found only two damaged insulators which were touching the molten guy. This case shows how important it is to break guy wires by insulators to prevent unwanted resonance in the antenna guys. Now, at last, we go to description of the Low Profile Antenna.



Low Profile Antenna for the 30, 20, 17, 15, 10 and 6- meter Bands Placed on a Fence

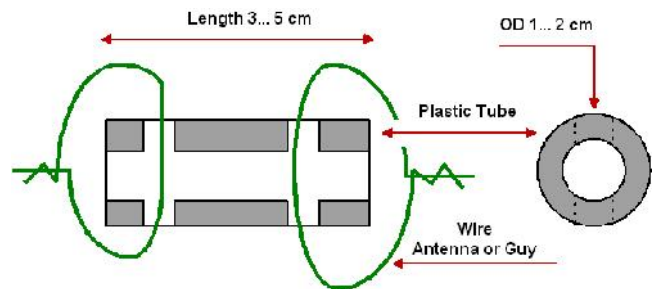


Figure 1
Design of Home- Made Antenna Insulator



Molten Insulator and Guy with Melted Insulation

Figure 2 shows schematic of the antenna. Nothing special is in the antenna. Antenna has 4 wires that accordingly have resonance in the 6, 10, 12 and 20 meter Bands.

The wires were fixed to the wooden fence in 1.8- meter height. Only wire for 6- meter band was placed in strait position. Wires for other bands were L-shaped.

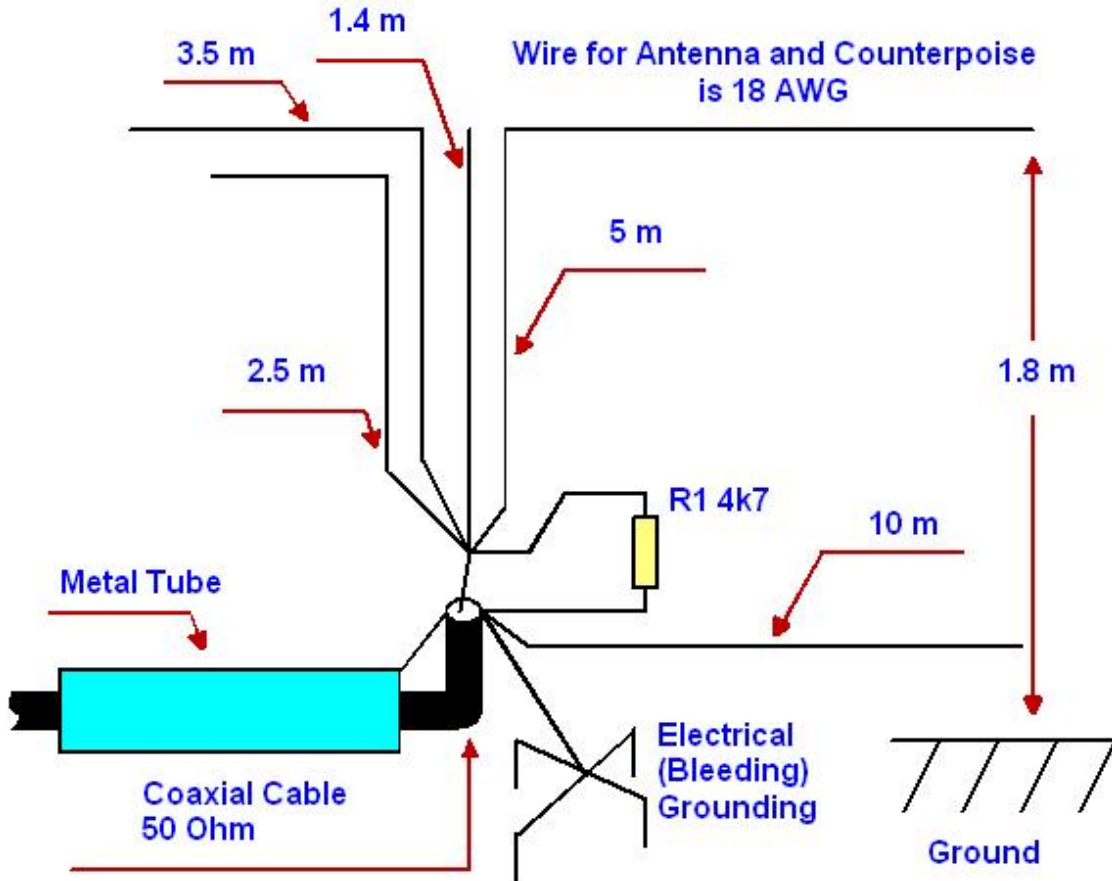


Figure 2
Schematic of the Low Profile Antenna

I would like describe some futures of the antenna design. Coaxial cable was connected to the antenna wires inside of a plastic electrical box. Coaxial cable was going to antenna inside of metal tubes that prevent damage of the coaxial cable. Cause of the damage mostly was my dog.

Dog run around backyard and was curious about every things that are near. Best way to resolve curiosity was gnaw these items. Squirrels as well sometimes gnaw coaxial cable. Metal tubes were bought in a DOLLORAMA store. Actually it was a holder mop. Such holder in length of 120 cm and in diameter 20- mm costs 1.25 CAD. Plastic insertions were at the ends of the mop holder. The insertions were successfully removed with help of a Heat- Gun. Just heat the plastic and then with help of pliers quickly remove it.



Electrical Box

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Coaxial cable was going inside of the tubes. Between the tubes I put some pieces of a cleaning tape for my soldering iron. The tape provides good electrical contact between the tubes. The tubes were connected by each other with help of a shrink with glue (I bought a 1.5 meter length of such shrink for 3 CAD in SAYAL). The tubes were fastened to the fence with help of Copper Strapping Tape.

For antenna ground it was used from one side a counterpoise in 10 meters length and from other side it was used a metal tubes (where the coaxial cable ran). At the antenna place I used electrical grounding similar to shown on the Figures 10, 11 and 12 from the article Universal Beverage Antenna

(http://www.antentop.org/019/va3zrw_019.htm).

The grounding should bleed the static from the antenna wires to the ground.

After there were listed some design futures of the antenna I would like to stop on the tuning of the beast. For me it was a not big deal. At first I printed several pages for writing down SWR and Z of the antenna at all bands. You may download the same templates pages at:

http://www.antentop.org/022/Low_profile_022.htm

Then I connected the coaxial cable to my lovely MFJ-259B and began the checking SWR/Z. Everything data were logged in the tables. Then I begin tune the antenna on the 6- meter band to a minimum SWR. After that I turn on to the next band- 10 meters and so on.

The antenna wire in the process is simply bent and attached to the fence with a stapler. It was some tricky procedure, when you tune the antenna for the one band you may find a lower SWR at another band (where the wires are not resonant).

At every tuning of the one antenna wire the SWR/Z for all Bands was measured and wrote off to the table. The procedure was repeated again to correct the bands where the SWR was growing... It took several hours to tune the antenna to all bands - 30, 20, 17, 15, 10 and 6- meter.

I managed to reach SWR 1.2:1 at 30 meters, SWR 1.7:1 at 20 meters, SWR 1.8:1 at 17 meters, SWR 1.5:1 at 15 meters, SWR 1.6:1 at 12 meters, SWR 1.5:1 at 10 meters, SWR 1.5:1 at 6 meters.

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Curious Dog



Plastic Removing of the Plastic



Metal Tube (a Holder Mop)

Of course, it is compromise tuning. However such tuning was satisfied for me. If you want tune the antenna only for 20,- 15,- 12,- 10 and 6 meter Bands you may reach low SWR (no more 1.3:1) for each band...

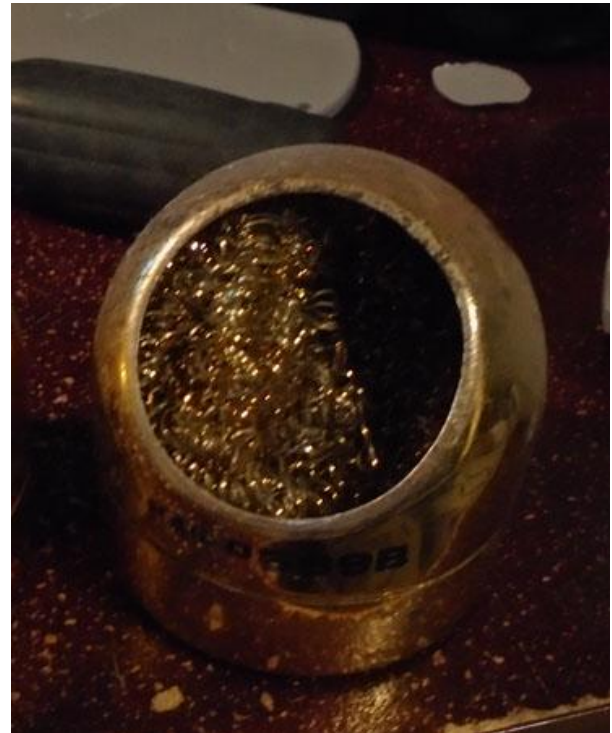
The antenna was tested in the Air. Obtained result was not bad for the fence antenna. 6 meter band is alive for me. I always could receive local beacon VA3UBL/B. It is near 40 km from me. I received some beacons from USA. There were beacons at distance up to 2000 km.

Antenna was compared on HF bands 30,- 20,-17,- 15,- 12 and 10 meter with Beverage Antenna (Test A-B). The Low Profile antenna loses to Beverage Antenna at receiving mode 1- 2 S on the S- scale of transceiver IC-7410.

However, at testing the antenna at transmitting mode I often have received for the Low Profile Antenna the same report as for Beverage Antenna. Low Profile antenna often helped me receive some station that I could not hear with my Beverage Antenna. It should be difference in DD of the antennas.

So my experiment with the Low Profile antenna was successful. I made weather proof, invisible antenna that could work at emergency situation at upper HF Bands from 30 to 6 meter.

**73!
VA3ZNW**



Cleaning Tape



Tubes with Cleaning Tape



Tubes on the Ground