

"Bottle" Antenna for 145 MHz

By Sergey Mironov, RA1TW

Any amateur can do the antenna during one hour. To do the antenna takes a half of hour and to tune the antenna also takes a half of hour. So, do not waste time and go to make the Bottle Antenna!

At first take a look at schematic of the Bottle Antenna ([Figure 1](#)).

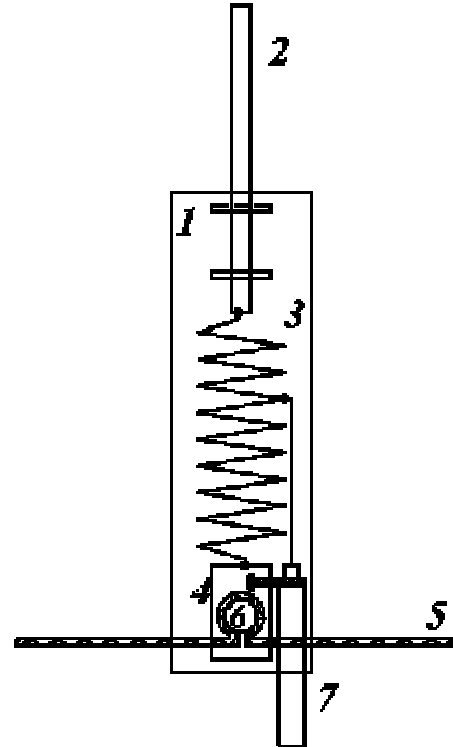
Specification:

1. Dielectric plate, approximately of 80x250-mm.
2. Vibrator, $(5/8)\lambda$
3. Matching spool
4. Tinned plate, approximately of 25x35-mm.
5. Counterpoises, $(1/4)\lambda$
6. Stud, washers, screw-nuts
7. Coaxial cable

How to do it

1. Take Dielectric plate (1) and install Vibrator (2) on the plate. Use clamps or hard wire for this.
- 145 MHz the vibrator takes the length 1270-mm at the diameter of the vibrator 4...5-mm, and 1200 m at the diameter of the vibrator 10... 14-mm.
2. Install Tinned plate (4) on the Dielectric plate. Use Stud, washers, screw - nuts (6).
 3. Do Matching spool (3). The spool has 9 turns of 1.5...2.5-mm diameter (# 14- 10 AWG) copper or silvered plate wire. ID of the spool is 15...18-mm, RA1TW use to old markers as a form for the spools. Length of the spool is 34-mm.
 4. Install the Matching spool on the Dielectric plate. For doing this, the upper end of the spool is fixed to the Vibrator and the down end of the spool is fixed to the Tinned plate. Use solder or fix the ends with the help of screws.
 5. Do counterpoises. Two 105-cm lengths of copper or aluminum wire of 4...6-mm (# 2...6 AWG) are bended as a Greek letter OMEGA looks (see [Figure 2](#)).

Bottle Antenna
Side view



Top view

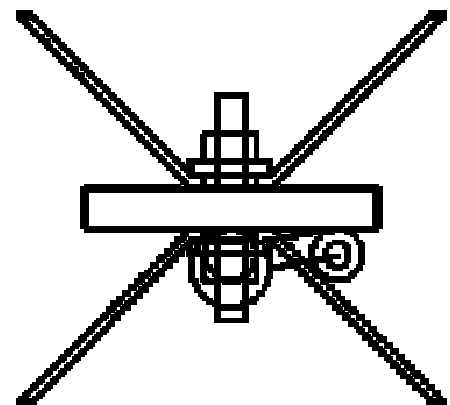


Figure 1

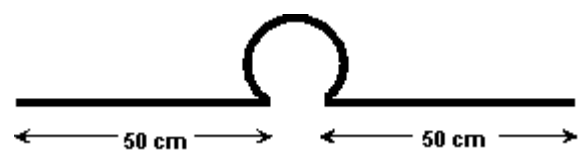


Figure 2. Counterpoises

- 6. Fix the OMEGA- counterpoises to the Stud with the help of the Screw-nuts. The counterpoises should be at 90 degree to the Vibrator and to each other.
- 7. Fix the OMEGA- counterpoises to the Stud with the help of the Screw-nuts. The counterpoises should be at 90 degree to the Vibrator and to each other.
- 8. Install Coax (7). Central core is soldered to 3-1/3 tap from the Vibrator, the braid is soldered to the Tinned plate (4).
- 9. Take a Bottle from dry drink. (I know, RA1TW always prefers a bottle from beer!. I.G.) Do a hole in the screw - top of the Bottle, cut the bottom of the Bottle, cut four slots for counterpoises, and then, install the Bottle (see photo) on the Antenna.

That is all the Bottle Antenna is ready!



Tuning:

The best way to adjust the Bottle Antenna is to use Meter of Amplitude vs Frequency Response characteristics. The device is switched to the Bottle Antenna and we see the frequency characteristic of the antenna. Stretch out the Matching spool or cut lengths of the Vibrator and Counterpoises if the resonance frequency of the antenna is below then 145 MHz. Gripe the Matching spool if the resonance frequency of the antenna is higher then 145 MHz Then select the tap for the best SWR. It is possible to match with the antenna a coaxial cable with any characteristic impedance –50 or 75 Ohms.



RA1TW



Of course, you can adjust the antenna with the help of only SWR – meter or VHF - bridge. There are 8 such home - made Bottle Antennas at Novgorod. All antennas work very well. They provide good communication as inside city as from city to a country for a distance more of 100 kilometers.

Credit line: <http://hamnv.boom.ru>

