Flat EH- Antenna for 10- MHz

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Credit Line: http://ehant.qrz.ru/exp_eh31.htm

Some days I heard 10- MHz. Good propagation conditions, lots stations but no antenna. Only 42- meters length of wire was connected to my ICOM- 7000 through ICOM AT-180. So, I decided to make EH-Antenna for the band. To avoid too much job with cylinders (that are commonly used at EH- Antenna) I made a Flat EH- Antenna from stuff from my scrap- box. It takes only 3- 4 hours for making and tuning of the antenna.

I made the antenna like an experimental for short time work. But the antenna showed so good performance that I leave it for my every- day work in the Air. **Figure 1** shows the Flat EH- Antenna.

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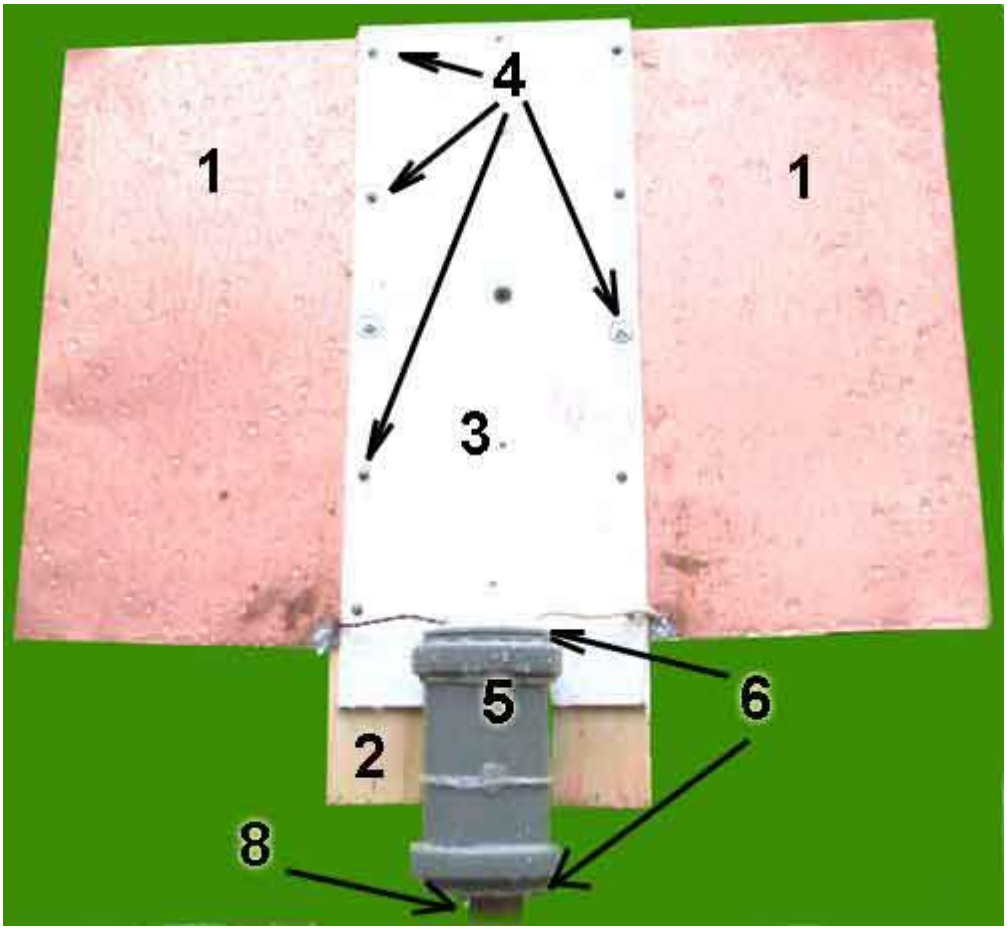

Figure 1 Flat EH- Antenna for 10- MHz

Below it is the **Parts List** for the EH- Antenna. For reference see **Figure 1**.

1. Two copper plate in dimension 180x315- mm and thickness not less the 1- mm.
2. Wood or plastic plate in dimension 150x400- mm and thickness near 10- mm.
3. Plastic plate in dimension 150x320- mm and thickness near 3- 4- mm.
4. Tens screw (M3- M4).
5. Plastic Coupling (dia near 50-mm) for water pipers.
6. Two caps for the Coupling.
7. Length of plastic water pipe, dia 32-mm and length 100-mm.
8. RF Socket, I used Female SO- 239.
9. Insulated wire 0.85-mm (AWG-20) OD, near 8-meters length.
10. Glue- Gun.
11. Soldering Iron.

Figure 2 shows the antenna draft. In Blue there are shown item 2 and item 4.

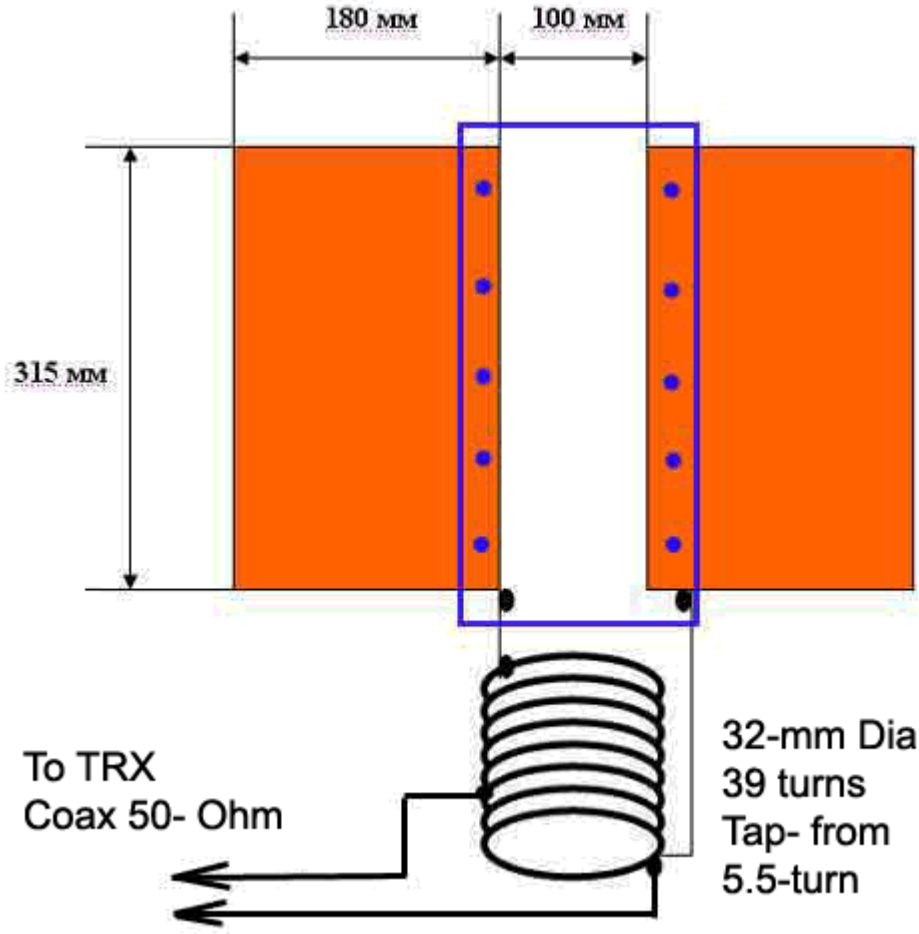

Figure 2 Draft of the Flat EH- Antenna

How to Do

1. Prepare the EH- Antenna work-piece.

Take item 2. Put it on a desk. Take item 1 and put it above item 2 according the draft (**Figure 2**). Put item 3 above item 1. Fasten the sandwich (item 2 to item 1 to item 3) with help of item 4. 50% of the job is done.

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2. The next step is to make inductor.

The inductor will be placed inside of the item 5. It needs to save the inductor from atmospheric influence- rain, snow, etc. At first prepare low cap (one of item 6). Install at centre of the item 6 the RF- Socket (item 8). At the second cap (one of item 6) make two holes in dia 2- 3-mm for wires going from the inductor to the EH- Antenna. Note, that after antenna tuning, the holes should be covered with glue from Glue Gun.

Inductor is wound at the item 7. Divide wire (item 9) in two lengths by 4- meters each. Twist the wire, 2-3 twist on centimeter. Then one end of the Wire is fastened to the form (item 7) leaving 100- 150- mm of the wire free.

Coil 39 turns and second end of the wire is fastened to the form. Beginning and ending parts of the inductor is coiled with some gap. Do tap from 5.5- turn from the bottom. It is tuning tap. Antenna is tuned by the tap (choosing the tap from the inductor) or moving coils coiled with gap between each other. The inductor is fastened with help of Glue- Gun at the bottom cap. **Figure 3** shows inductor installed on the coupling cap.

Figure 3 Inductor of the Flat EH- Antenna

3. Antenna tuning

Solder upper end of the inductor to one copper plate, bottom end to another. (Inductor is still outside the coupling box- item 5.) Tune the antenna. With help moving of the upper coils the antenna is tuned to needed frequency, with help moving the bottom coils the antenna is tuned to minimum SWR and maxima EMF. After tuning of the inductor, glue the coils by several drops of the glue. Tuned inductor should be placed inside item 5, then item 6, then protect with the glue all jointing and holes of the detail. **Figure 4** shows the inductor inside of the coupling.

That is all. Flat EH- Antenna is ready. I installed the antenna on a wooden mast in 2- meters length. Three guys supported the mast. Antenna was fed by coaxial cable RG-58/U –MIL in length 19.2- meters. Antenna was installed near my home, in 12 meters from the wall. Coaxial cable that is going from Flat EH- Antenna was buried into the earth (on a small depth). Near the antenna were trees that were higher that the antenna. **Figure 5** shows the installations of the EH- Antenna.

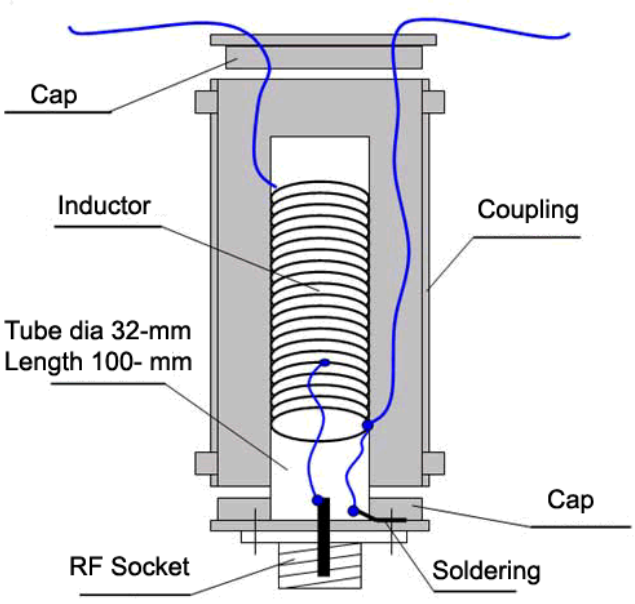

Figure 4 Inductor of the EH- Antenna inside of the Coupling

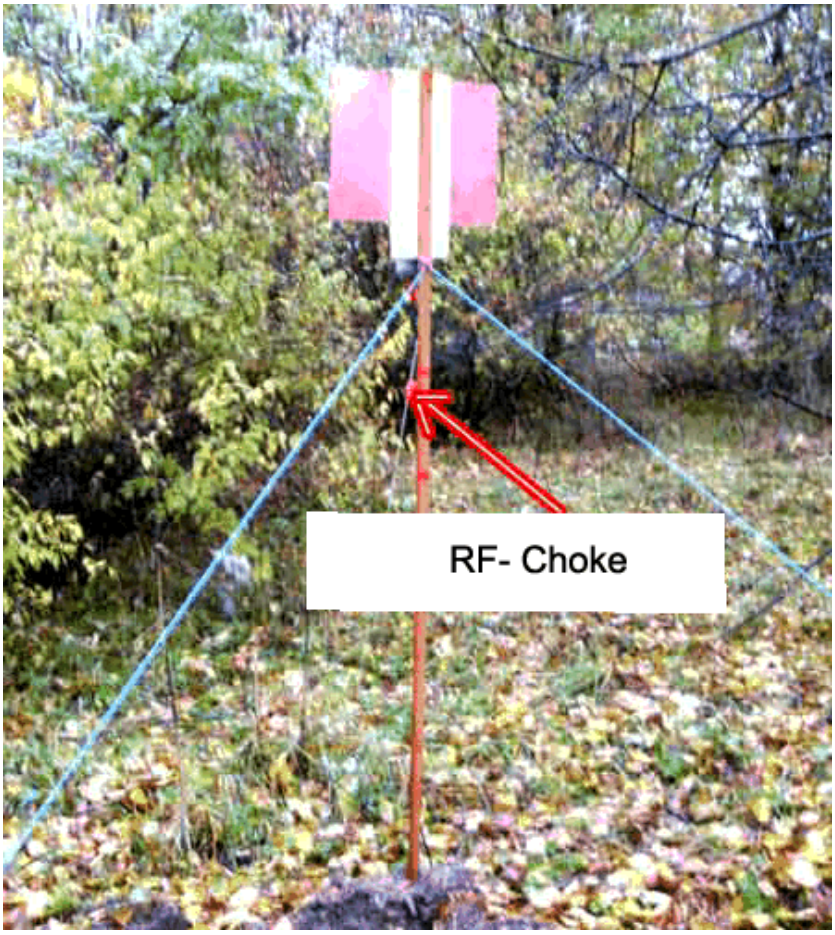

Figure 5 Flat EH- Antenna near my Home

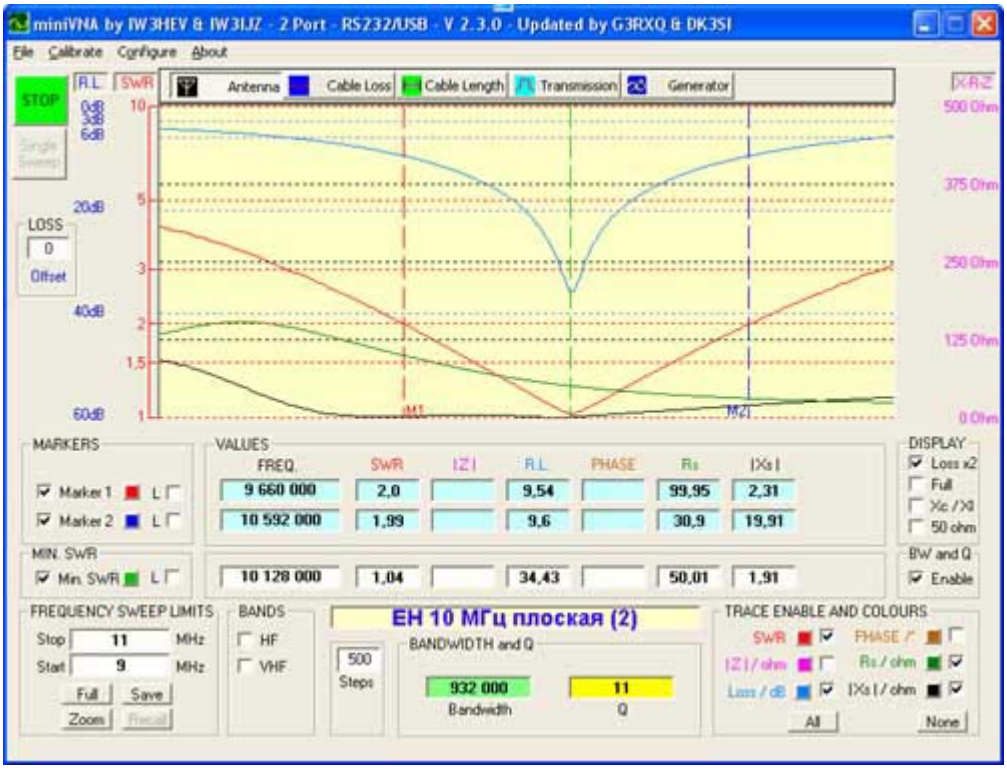

Figure 6 Parameters of the EH- Antenna.

It was a lots deal to do at that day (when I made the antenna), so at last I just measured the antenna parameters but not tested the antenna in the Air. **Figure 6** shows the parameters of the EH- Antenna. The antenna has band- pass in 930-kHz (at SWR less the 2).

Near the antenna was installed RF- Choke- several turns of coaxial cable around of a ferrite ring. The choke is visible on the **Figure 5**.

The next day a rain was coming. Water dropped from the antenna and I thought that no chance the antenna alive. **Figure 7** shows the antenna into the rain.

Figure 7 Rain and Flat EH- Antenna

I turned on the EH-Antenna instead of my 42- meters wire… Noise (compare to 42-m- LW, the antenna installed from another side of my home) dropped down but stations went up. First QSO was with UA0AV, Sergey, Krasnoyarsk- 599. Next ones- M0IOW, RK4HE, SP3OOC and VK3XQ, Australia, my rapport 539, I heard him 56/79. May be good propagation… anyway, for small EH-Antenna placed at 2- meters above the ground- it is very good. Then I had QSOs with OK1HAJ, RV3QX, SP9FVO, YU5R, GM0IXO, ON3URT, OZ1HVL, UA4SKW, SP4NDV, UT0EG, DR600UL, RA9FFF, UN1L, RA9JAT, RM9WK, ON3WP/qrp, LA9SN, RD3BD, RV3SBS

So, I decided do not remove the EH- Antenna and tested it in next days. For me it was interesting how the antenna would be worked at show conditions.

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73!
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St. Petersburg, October- 2009

See next article
Flat EH- Antenna for 10- MHz in the Winter
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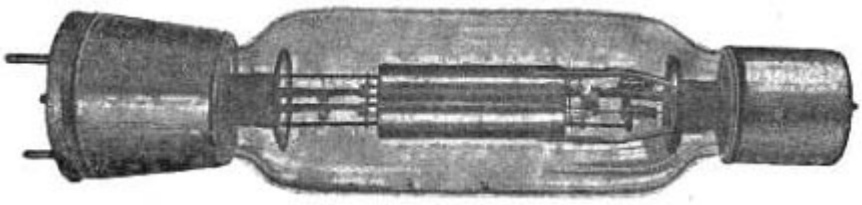

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