Antennas UA6AGW

Aleksandr Grachev, UA6AGW

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Two HF- antennas for 80- and 40- meter Bands are described below. The antennas were created after my experimenters with magnetic Loop Antennas (Reference 1).

Antenna for the 40- meter Band

Figure 1 shows sketch of the antenna. Loop of the antenna made of a length a coaxial cable marked as "LCFS 114-50 JA, RFS (15239211)". **Figure 2** shows the cable. Outer tube of the coaxial cable has diameter near 25- mm (1 inch). Inner conductor of the cable is a copper tube in diameter of 9- mm (3/8 inch).

Figure 2 Coaxial cable "LCFS 114-50 JA, RFS (15239211)"

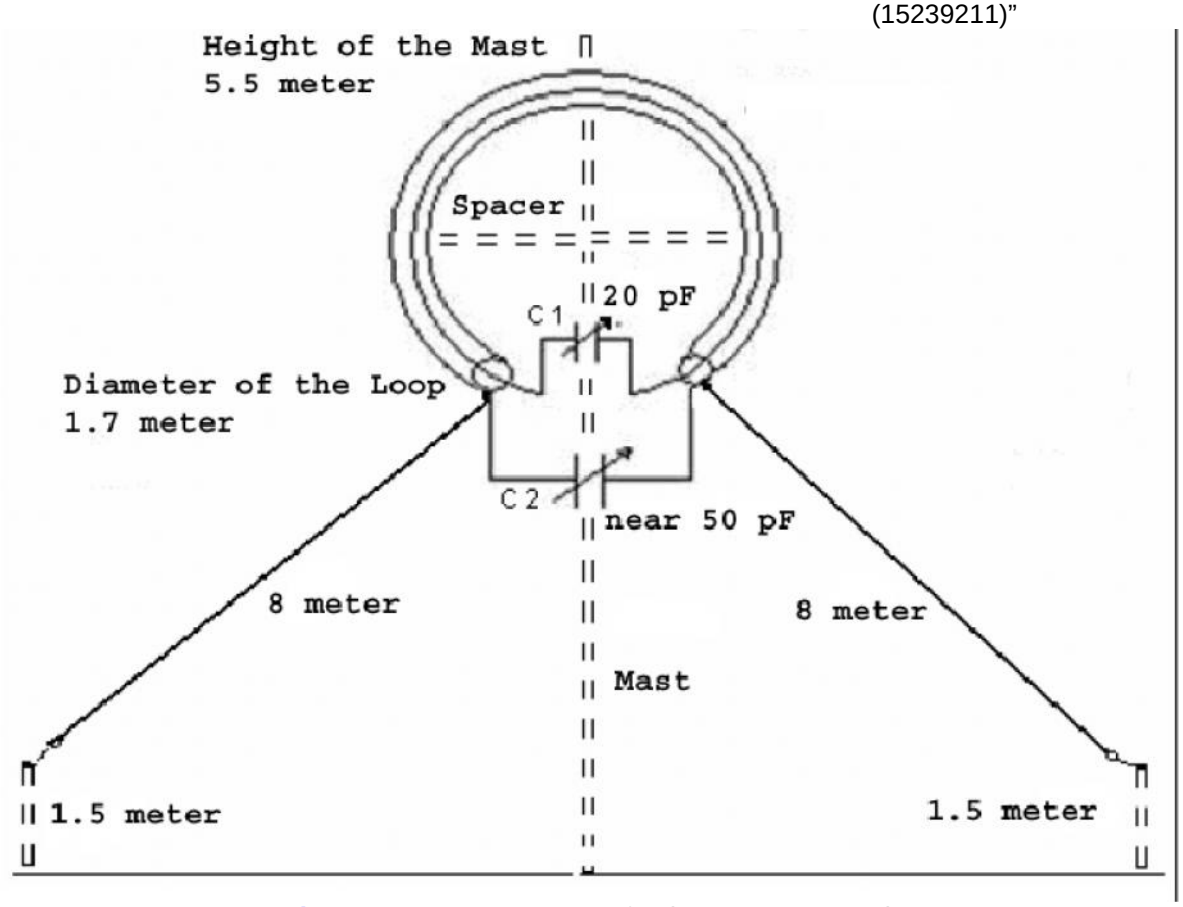

Figure 1 Antenna UA6AGW for the 40- meter Band

The antenna fed by a coupling loop. For simplicity of the design the coupling loop made from the feeding coaxial cable. **Figure 3** shows the coupling loop before it is circulated to loop. Length of the coaxial cable to be used for the coupling loop is 200- mm. Plastic from the length of the coaxial cable is removed on to 10– mm in the center and from two ends. Then braid of the coaxial cable is removed at the center. Inner conductor is soldered to the braid at the far (right) end of the length.

Then the cable is turned to loop. Far end of the length is soldered to the first (left) side of the prepared cable. (In Russia the method of the making the coupling loop sometimes is named “method of the DF9IV”) The coupling loop is fastened to the upper part of the antenna’s loop with help of a Scotch. **Figure 4** shows the picture of the antenna. Capacitors are in the plastic box. Horizontal wires have diameter 2... 3- mm. Copper strand wire or antenna cord may be used for those ones.

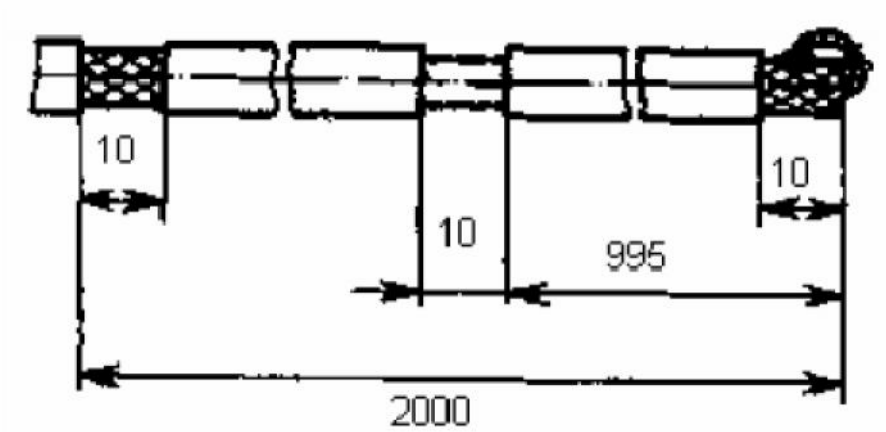

Figure 3 Preparation of the Coupling Loop for the Antenna UA6AGW for the 40-m Band (Dimensions in mm)

Figure 4 Picture of the Antenna UA6AGW for the 40-m Band

I believe that antenna arrangement according to **Figure 1** has optimal parameters. SWR of the antenna was less 2.0:1.0 at the pass band 200- kHz. In the vertical plane Antenna has DD similar to an ellipse with a maximum in the radiation along the horizontal wires. Vertical plane radiation is going at the angle near 25- degree. In the horizontal plane the antenna has almost circular DD.

Antenna for the 80- meter Band

Figure 5 shows sketch of the antenna.

Loop of the antenna made of a length a coaxial cable in diameter of 1-1/2 inch.

Horizontal wires are located parallel to the ground at the height 3.5- meter above it. Such antenna design was taken by me because of the local conditions and my possibility. Capacitors are placed in the plastic box. **Figure 6** shows a picture of the antenna. **Figure 7** shows the plastic box with installed inside capacitors. Coupling Loop made according to **Figure 8**. Horizontal wires have diameter 2... 3- mm. Copper strand wire or antenna cord may be used for those ones.

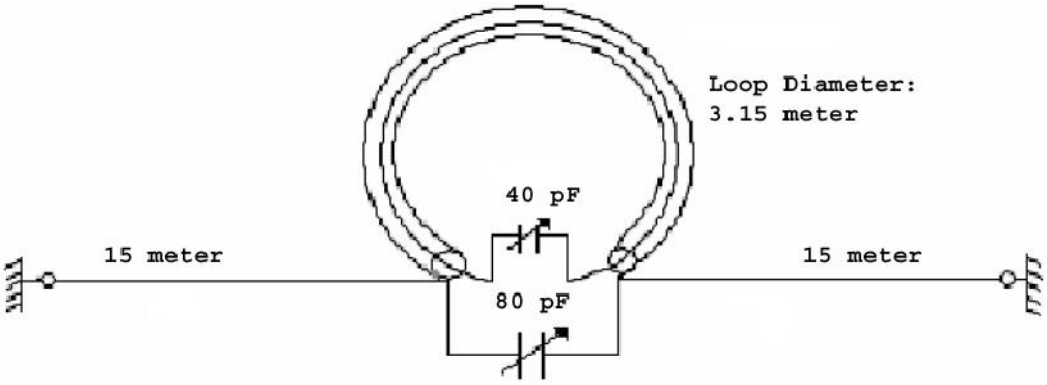

Figure 5 Antenna UA6AGW for the 80- meter Band

Figure 6 Picture of the Antenna UA6AGW for the 80-m Band

SWR of the antenna was less 2.0:1.0 at the pass band 100- kHz. In the vertical plane Antenna has DD similar to an ellipse with a maximum in the radiation along the horizontal wires. Vertical plane radiation is going at the angle near 25- degree. In the horizontal plane the antenna has almost circular DD.

Tuning of the Antennas

Tuning of the antennas is very simple. Firstly, set the capacity of the capacitor C1. Capacity should be 20… 23- pF for antenna for 40- meter Band or 37… 40- pF for antenna for 80- meter Band. Then turn on the coaxial cable to transceiver. Antenna is tuned up to the resonance with help of capacitor C2.

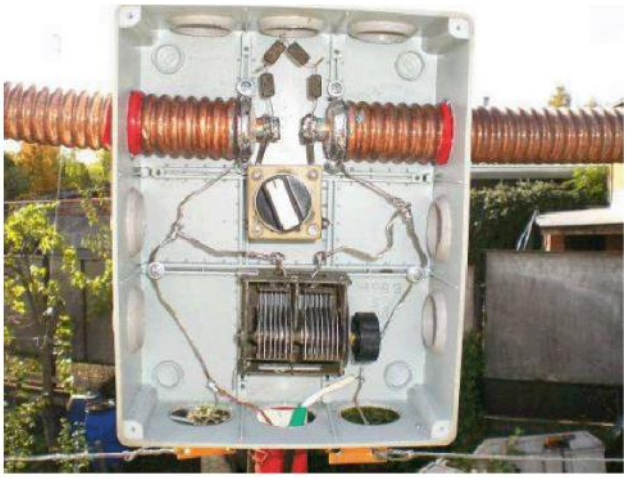

Figure 7 Plastic box with Capacitors

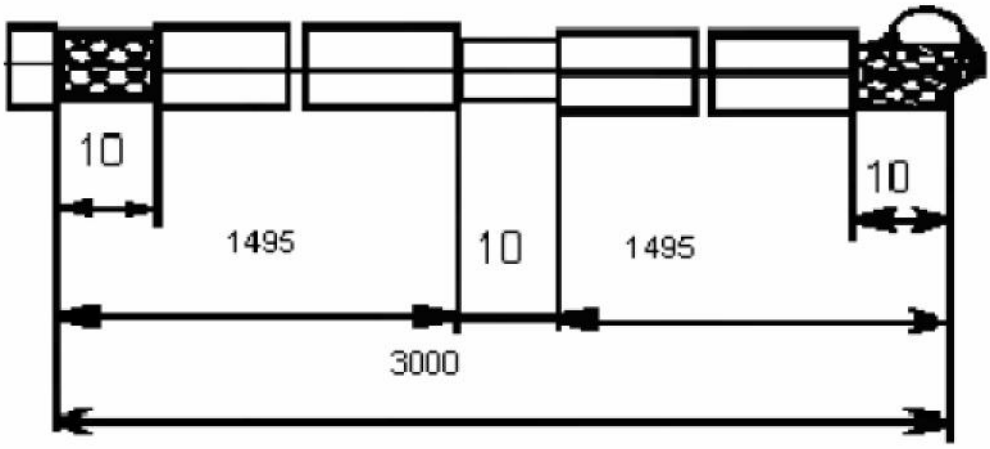

Figure 8 Preparation of the Coupling Loop for the Antenna UA6AGW for the 80-m Band (Dimensions in mm)

It may be done either in the receiving mode- just tune the C2 on to maximum receiving signals, or in the transmitting mode- just tune the C2 on to minimum SWR. It is possible to tune the antenna with the help of a FSM (Field Strength Meter). Maximum reading the FSM is matched to the minimum SWR.

Test of the antennas

The antennas were installed at my cottage where I was not so often in the Air to be enough to get an objectively judgement about the performance of the antennas. Antenna for the 40- meter Band was used to me often compare to antenna for the 80- meter Band.

At the 40- meter Band all continents (above the Antarctica) were worked with the antenna. At the 80- meter band I worked with East, West, North Europe, with ex- USSR Asia (Habarovsk, Chita), with Middle East. I used a SDR- transceiver with 100- Wtts output on the bands.

Resume

Table 1 shows resume on the antennas

References

1. Aleksandr Grachev:- Experimenters with Magnetic Loop Antennas.: CQ- QRP # 27, pp.: 9- 11.

Table 1 Data for Antenna UA6AGW

#	Antenna:	Rate
1	Not required counterpoises or good ground	Good
2	Vertical lobe is at 25 degree to the horizon	Very Good
3	May be installed at height 1/8- lambda above the ground to get the lobe vertical lobe 25 degree to the horizon	Very Good
4	Has SWR less 2.0:1.0 at pass band 100- kHz at 80- meter Band and SWR less 2.0:1.0 at pass band 200- kHz at 40- meter Band	Good
5	Easy to tune up	Good
6	Has circular horizon DD	Good
7	Has Low noise	Very Good
8	Low affected to -man made/static/lighting- interferences	Good
9	Not affected to moving around metal objects or man	Very Good

73/72! UA6AGW