Antennas UA6AGW. Modification and Development

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In the summer 2011, UA6AGW persistently have been working on improvement of his antennas (see **Reference 1**). Article below is just a digest of the hard work.

Introduction

Figure 1 shows parameters of the Antenna UA6AGW V.40.0 that is obtained from the test with help of an Antenna Analyser AA- 330M. As it seen from **Figure 1**, the antenna has too much reactance at the working frequency. Next version of the antenna, Antenna UA6AGW V.40.1, has no the lack.

Antenna UA6AGW V.40.01

At the new version of the antenna the diameter of the loop was decreased. There were shortened the horizontal wires. Capacity of the capacitor C2 was increased. **Figure 2** shows the design of the new antenna- Antenna UA6AGW V.40.01.

The modification is caused increasing of the RF-voltage across the capacitor C2. If you remember, in the previously version (Antenna UA6AGW V.40.0) it was used an air- gap capacitor for C2.

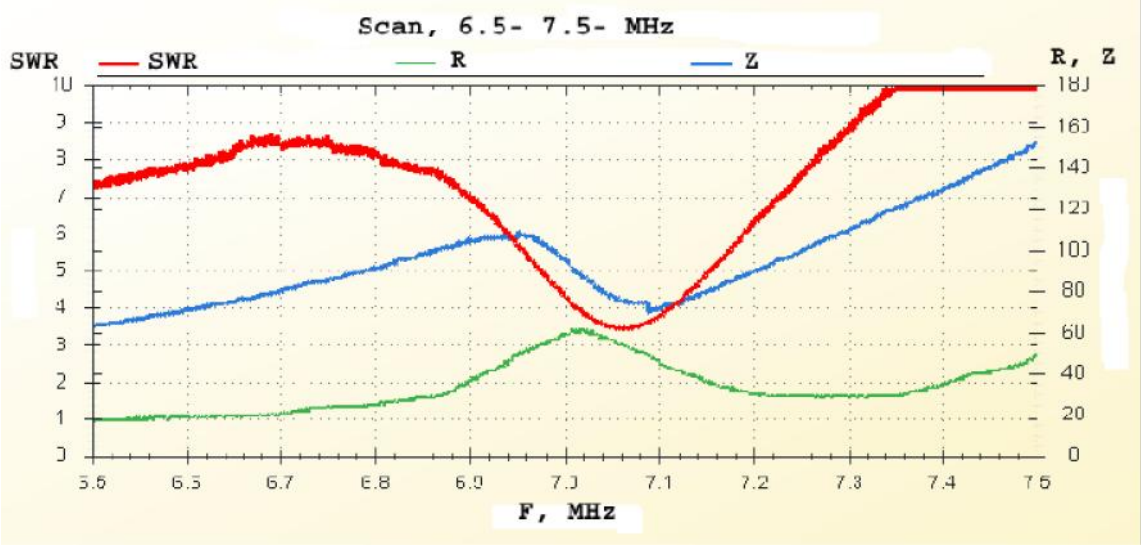

Figure 1 Parameters of the Antenna UA6AGW V.40.0

At the new version (Antenna UA6AGW V.40.01) there were used a fixed High- Voltage RF- Capacitors (Russian brand K-15U-1) for C1 and C2. Antenna was tuned in to resonance by changing of the length of the horizontal wires. **Figure 3** shows the box with the capacitors.

Figure 4 shows parameters of the Antenna UA6AGW V.40.01 that were obtained from the test with help of an Antenna Analyser AA- 330M. Antenna UA6AGW V.40.1 was demonstrated at annual *South Russia Maykop- Hamfest – 2011*.

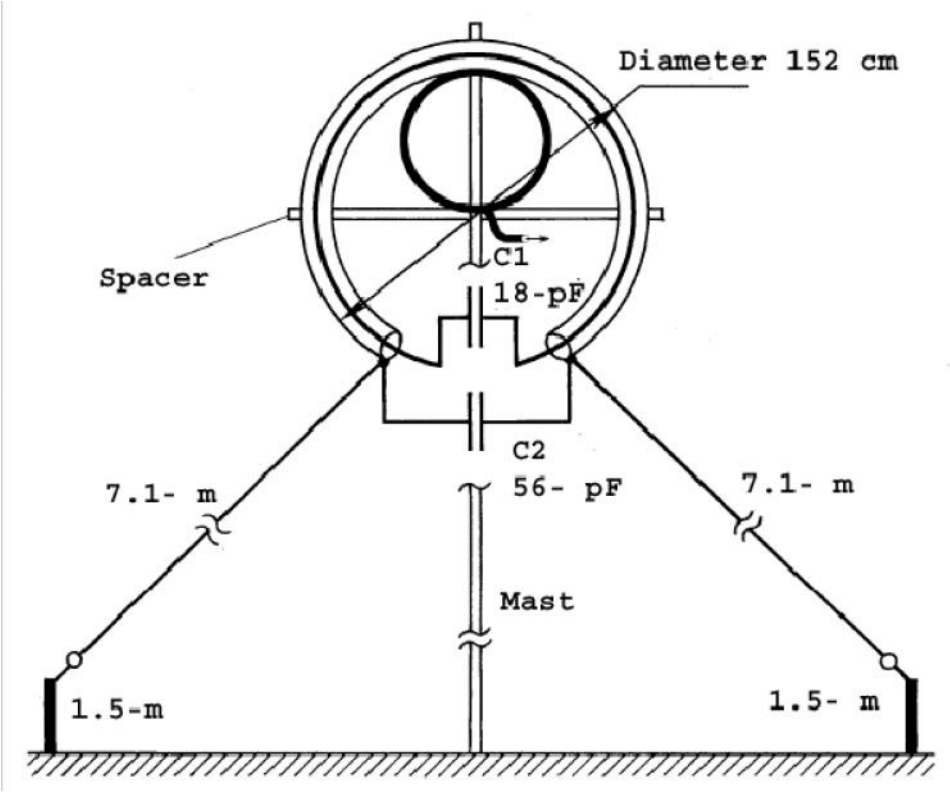

Figure 2 Design of the Antenna UA6AGW V.40.01

Figure 3 Capacitors Box

Antenna UA6AGW V.40.02

Another version of the antenna- the Antenna UA6AGW V.40.02 was created like a cheap, light and suitable for field day antenna design. To reach the goals for loop of the antenna it was used a light coaxial cable with outer diameter of ½ inch.

Geometrical sizes of the antenna parts and the value of the capacitors are the same as for antenna UA6AGW V.40.01.Parameters of the antenna are almost equal to parameters of the antenna UA6AGW V.40.01 (those ones are shown at **Figure 4**).

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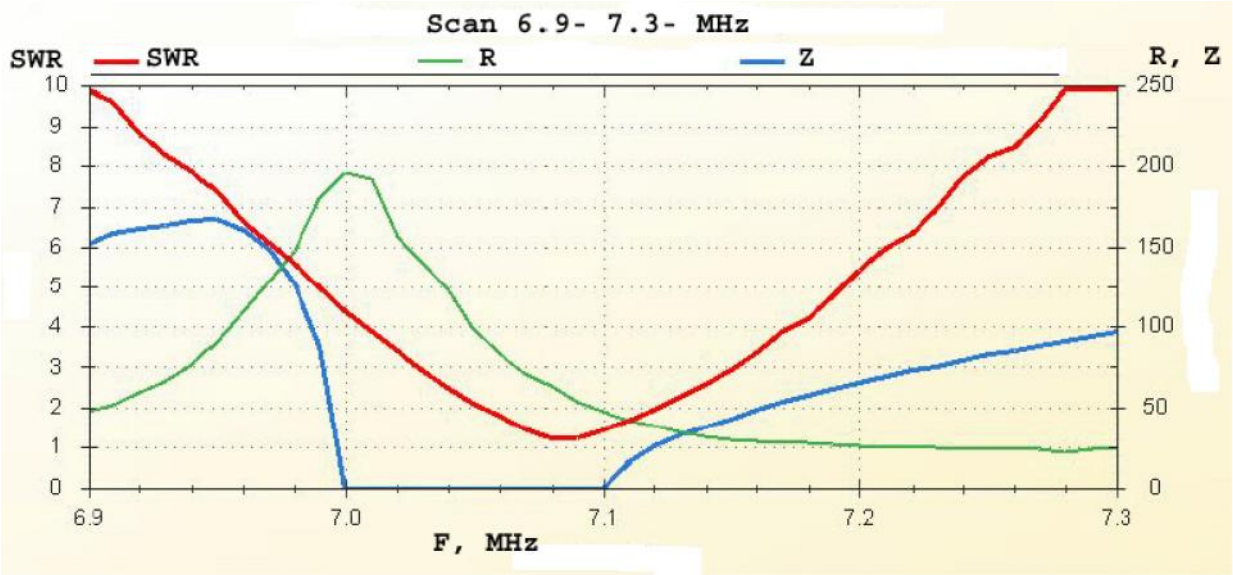

Figure 4 Parameters of the Antenna UA6AGW V.40.01

Antenna UA6AGW V.80.01

Design of the antenna UA6AGW V.80.0 was modified for purpose to reach a low reactance and ability to tune the antenna to resonance across the 80- meter Band. The new version was named antenna UA6AGW V.80.01.

Figure 5 shows the design of the antenna. Antenna has pass band (at SWR 2.0: 1.0) only 100- kHz. However, capacitor C2 (the capacitor is accessible for me so to tune the antenna for needed part of the band is a not big deal) can tune the antenna across the 80- meter Band.

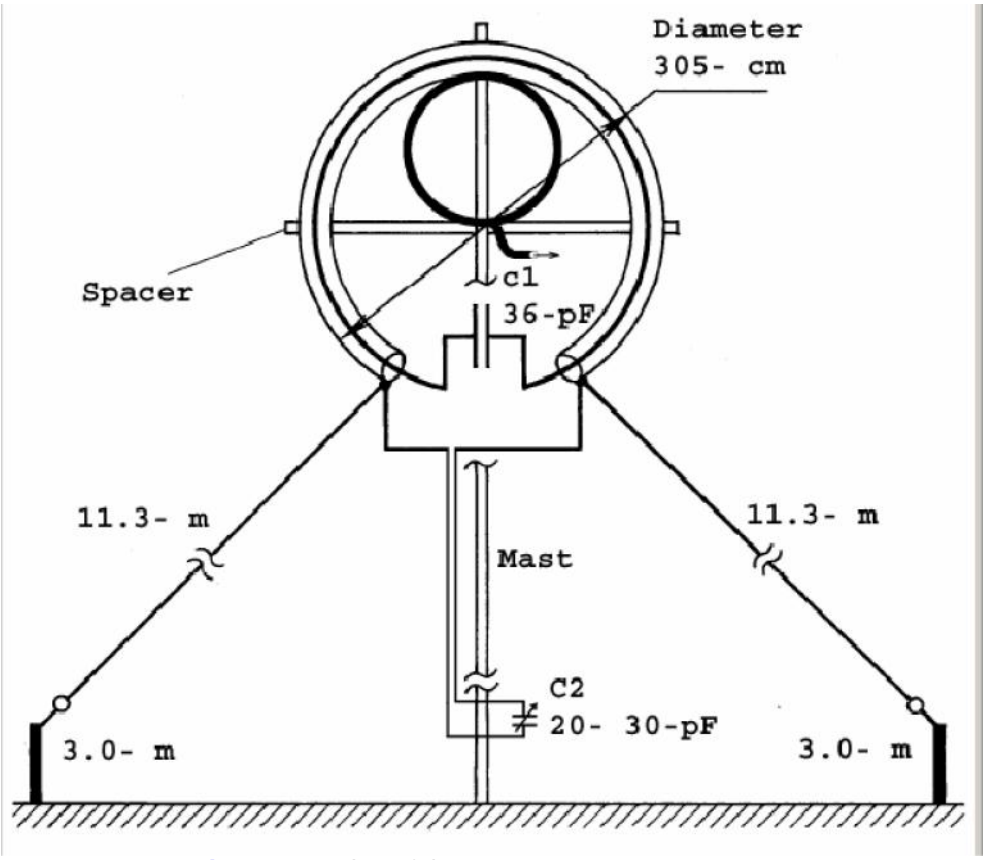

Figure 5 Design of the Antenna UA6AGW V.80.01

The capacitor C2 is switched on into the antenna with help of a two- wire line. It is possible use to almost any design of the two wire line. Antenna mast at my antenna installation has length near 11-meter. The two wire line going from the bottom of the loop is near 8- meter long.

Coupling loop for the antennas

Design and sizes of the coupling loop that used for the antennas is the same as for antennas described in the **Reference 1**. Below there are several simple rules how to install the coupling loop.

At first, find on the antenna loop a point that is equidistance from left and right side of the C2. It is ***the point of symmetry*** of the antenna.

At second, find the point of symmetry of the coupling loop. The coupling loop is mounted in the top of the antenna loop. Point of symmetry of the coupling loop should concur with the point of symmetry of the antenna. **Figure 6** shows the coupling loop on the antenna.

At third, to fasten with help of the cable ties the coupling loop to the antenna loop at the distance of 6…8- cm from the point of symmetry of the antenna loop. **Figure 7** shows the bonding.

Antenna Антенна UA6AGW V.20.00

The antenna was designed and made by Igor Kulikov, UA3GDX (QTH: Gryazi, Lipetsk Region). **Figure 8** shows the design of the antenna. Loop of the antenna made from a water tube in diameter of 2/3 inch. It was a tube with outer aluminum cover and inside plastic form. Aluminum cover was used like the braid in the loop in the design of the Antenna UA6AGW. A coaxial cable was inserted into the tube. Braid of the coaxial cable was the inner conductor of loop in the design of the Antenna UA6AGW. Central conductor of the coaxial cable did not use to. Capacity of the capacitors C1 and C2 are shown approximately and depend on the antenna installation. However, it looks like that capacity of the C1 should be close to 8… 15- pF and capacity of C2 should be close to 24… 30- pF.

Figure 6 Coupling Loop on the Antenna Loop

Figure 7 Bonding of the Coupling Loop to the Antenna Loop

Horizontal wires in the antenna design made of a copper wire in diameter of 3- mm. The wires are going along plastic fishing poles. The poles hold the form of the antenna. Such rigid design allows rotate the antenna on to needed direction. **Figure 9** shows the view of the antenna on a roof. **Figure 10** shows the close-up view of the antenna.

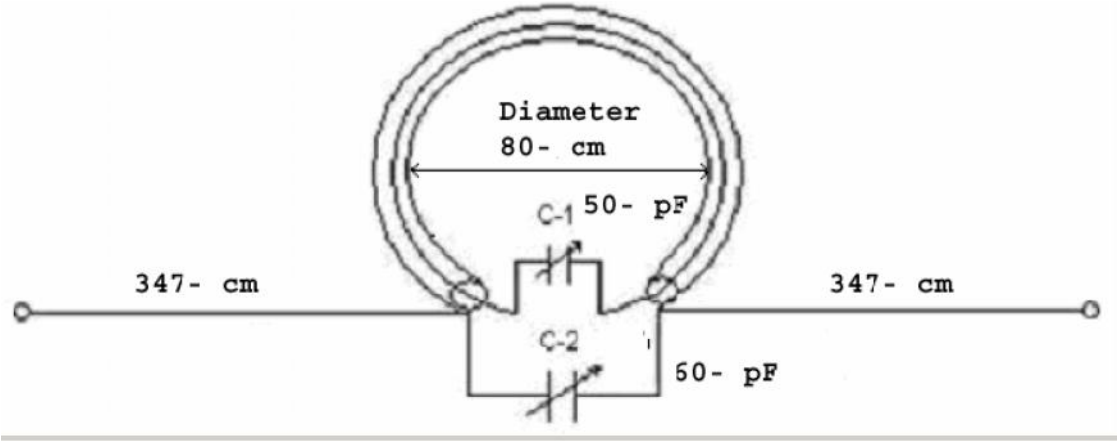

Figure 8 Antenna UA6AGW V.20.0

Coupling loop for the Antenna UA6AGW V.20.0 may be made similar to the coupling loop from **Reference 1**. However, perimeter of the coupling loop should be decreased to 800- mm. The antenna was installed at the height of 8- meter above the ground. Antenna UA6AGW V.20.0 was compared with an antenna G5RV that was installed at 21- meter above the ground. It was used a transceiver TS870S with testing of the antennas. Igor wrote about the testing: At the Mode JT65A (software JT65-HF) the antenna UA6AGW V.20.0 allowed me to work with South Africa- 18- dB, Far East– 12- dB, Australia- 15- dB. Antenna G5RV received those territories much worst. Antenna UA6AGW V.20.0 is low noise antenna. The antenna could gain in direction (when it rotated) up to 5… 10- dB, sometimes up to 15- dB.

References

1. Aleksandr Grachev, UA6AGW: **Antennas UA6AGW,- ANTENTOP- 01- 2013, pp.: 31- 35.**

Just a PA…

Figure 9 View of the Antenna UA6AGW V.20.0 on a Roof

Figure 10 Close up View of the Antenna UA6AGW V.20.0