

Once again about a magnetic loop ...

by Igor Grigorov, RK3ZK

I made probably hundreds various magnetic loops (and on basis of hula- hoops, of course!) for work in ranges of frequencies from 136 kHz up to 148 MHz. And always I have got rather quite good results, as at work of these antennas on reception, and at their work on transfer. And I am certainly glad, that Jury too has engaged in magnetic loops antennas!

For those hams who want to engage in experiments with magnetic loops on basis of hula-hoops, I have made calculations of magnetic loops antennas made on basis of hula-hoops with diameter 77 cm and 100 cm. KI6GD

**Table 3**

Band, m	80	40	30	20	17	15
Hula- Hoop 100 cm OD	500	300	250	200	180	200
Hula- Hoop 77 cm OD	600	350	300	250	200	180

**Magnetic Loop Antenna Calculator V.1.3** was used for this calculations. This program rather well counts parameters of magnetic loops antennas, and I recommend for all hams to use it. **Table 1** and **Table 2** show data of this calculation/

I also calculated sizes for gamma matching and **Table 3** shows it. The sizes, of course, need to be corrected at a real antenna design.

**I wish you good luck in experiments with magnetic loops antennas!**

**The Gamma Match consists of from 1-mm OD (#18 AWG) placed at 50 mm above the Hula- Hoop**  
**Download Free files for Mag Loop at :**

<http://www.qsl.net/dl2kq/mmana/4-3-7.htm>

**Table 1**

Loop dimension: 77 cm OD, Aluminum tube 17 mm OD Loop Property: Loop Area 1.5 meter, Inductance 2.282 µH						
Frequency, MHz	3.6	7.03	10.1	14.06	18.1	21.1
Bandwidth, kHz	8.1	11.6	14.8	20.7	31	43.1
Capacitor Value, pF	849	217	101	48.6	26.3	17.4
Capacitor Voltage (at 5 Watts Power), V	300	600	700	800	900	900
Conductor Wavelength, λ	0.031	0.06	0.086	0.119	0.153	0.179
Efficiency, %	0.2	2.5	8.3	22.4	41	54.4
Inductive Reactance, Ohms	51.6	100.8	145	201.6	259	302.5
Loop Q, Qres	442	604	681	680	585	489.5
Radiation Resistance, Ohms	0.00	.0002	0.009	0.033	0.091	0.168
Resistance Loss	0.058	0.081	0.098	0.115	0.131	0.141

Table 2

Loop dimension: 100 cm OD, Aluminum tube 17 mm OD Loop Property: Loop Area 2.6 meter, Inductance 2.287 $\mu$ H						
Frequency, MHz	3.6	7.03	10.1	14.06	18.1	21.1
Bandwidth, kHz	8.4	12.4	16.8	27.1	47.5	73.3
Capacitor Value, pF	671	169	77.3	36.4	17.7	10.6
Capacitor Voltage (at 5 Watts Power), V	400	600	700	800	800	700
Conductor Wavelength, $\lambda$	0.04	0.077	0.111	0.155	0.199	0.232
Efficiency, %	0.5	5.3	16.5	38.7	61	72.3
Inductive Reactance, Ohms	64.9	126.8	182.2	253.6	326.4	380.6
Loop Q, Qres	427	568	600	520	381	287
Radiation Resistance, Ohms	0.00	.0006	0.025	0.094	0.259	0.478
Resistance Loss	0.076	0.106	0.127	0.149	0.17	0.183

Twins Delta Loop for 145 MHz

by Nick V. Derenko, US8AR



US8AR



ex UB5AEO, UB4AR <mailto:us8ar@qsl.net>  
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<http://us8ar.narod.ru>

SOMEWORDS ABOUTE MYSELF

Hello ! If it's interesting I'll tell some aboute myself. I was born 25 may 1957 y. in Snesznoe town of Donetsk obl. of Ukraine. After finishing Primorsko-Akhtarsk's school in 1974 I worked a locksmith and a turner. In 1975 I entered in Taganrog radiotechnical institute and finished it in 1980. After it I living and working in Romny town of Sumy oblast of Ukraine. I worked an engineer in Romny's branch of Leningrad NPO "Krasnaja Zaria" and seniorengeener in Special Design Bureau "Poisk". Since 1997 I working a foreman of powerenergetics of "Akhtyrkaneftegaz". I am married and have daughter and son.

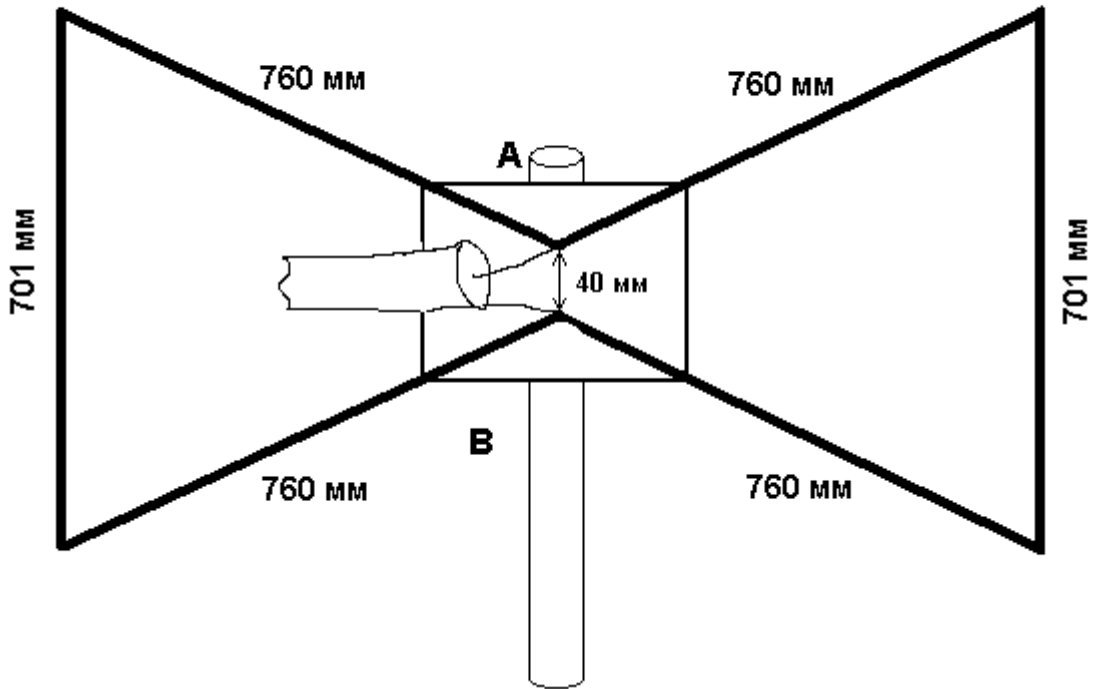
Specification:

- Directional diagram: "Eight" with low-altitude beam to horizon;

- Input resistance: 50 Ohm;
- Polarization - Vertical;
- Gain 6 dB;
- SWR 1,01:1.

Figure 1 shows the antenna.

Figure 1



The antenna is made from a copper or aluminum wire in diameter of 4 mm. A copper or brass tube also will do well. The wires fastened by collars to a dielectric plate in 4 mm thickness. I use a plate from PC stuff. The plate fastened by collars to the antenna metal mast.

A coaxial cable is connected to points "A" and "B" (the central core to "A", the braid to "B").

Below, there is a file of the antenna in [MMANA](#).

(MMANA available FREE at [www.qsl.net](http://www.qsl.net))

The great collection Antenna Files at: <http://www.qsl.net/dl2kq/mmana>

Twins Delta For 145\_50 MHz

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*
145.5
* wire *
7
0.0, 0.6845, -0.3505, 0.0, 0.6845, 0.3505, 0.002, -1
0.0, 0.6845, -0.3505, 0.0, 0.0, -0.02, 0.002, -1
0.0, 0.6845, 0.3505, 0.0, 0.0, 0.02, 0.002, -1
0.0, 0.0, -0.02, 0.0, -0.6845, -0.3505, 0.002, -1
0.0, 0.0, 0.02, 0.0, -0.6845, 0.3505, 0.002, -1
0.0, -0.6845, -0.3505, 0.0, -0.6845, 0.3505, 0.002, -1
0.0, 0.0, -0.02, 0.0, 0.0, 0.02, 8.000e-04, -1
*** sources ***
1, 1
w7c, 0.0, 1.0
*** load ***
0, 1
*** Autosegment ***
400, 40, 2.0, 1
*G/H/M/R/AzEI/X*
0, 5.0, 0, 50.0, 0, 0, 0
    
```

Enjoy!