Delta Loop UN7CI for 7, 10, 14 and 21-MHz

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The antenna was designed to work from a field conditions at amateur's bands 7, 10, 14 and 21-MHz. The antenna has SWR less the 2.0:1.0 at height of the lower side 1.2 meters above the ground. Antenna has good efficiency.

At band 14-MHz the antenna is working like a full-sized "Delta Loop" (**Figure 1**). At band 10-MHz the antenna is working like an electrically lengthened (with inductor) "Delta Loop" (**Figure 2**). At band 7-MHz the antenna is working like a lambda/2 I.V. (**Figure 3**). At band 21-MHz the antenna is working like a 3lambda/2 I.V. (**Figure 4**).

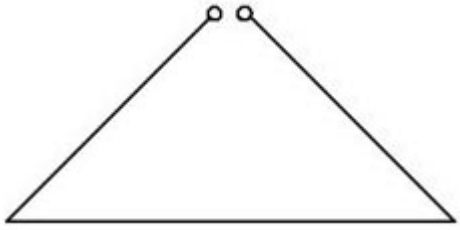

Figure 1. Full sized "Delta Loop" for 14-MHz

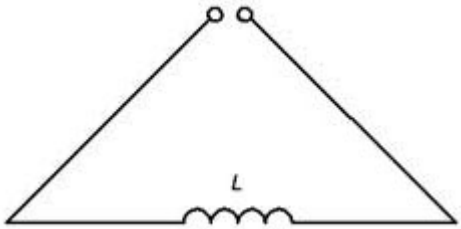

Figure 2. Electrically Lengthened "Delta Loop" for 10-MHz

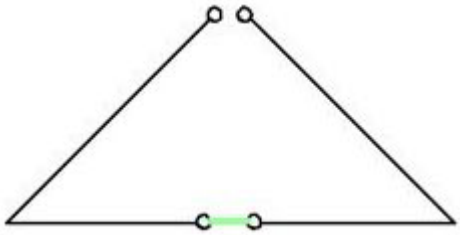

Figure 3. Lambda/2 I.V. for 7-MHz

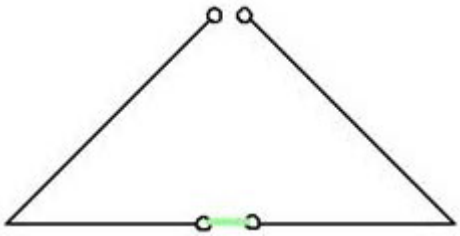

Figure 4. 3Lambda/2 I.V. for 21-MHz

So, on the base a Delta Loop with perimeter 20 meters (or I.V. having two 10 meters wire) it is possible to do a four band antenna. **Figure 5** shows the design of the antenna.

If the antenna is used for a field operation and the middle of the antenna is accessible it is possible to switch operation band with help of any suitable manual switch. Off course, it is possible to use RF- relays to choose the band. Inductor L contains 20 turns of insulated wire in diameter of 1.5-mm (15-AWG), coiled turn to turn on diameter 50- mm.

Tuning

Step 1: Antenna is installed at working position. Band's Switch is installed at position "3"- 14-MHz. RF signal (14.150-MHz) is sent to the antenna. Antenna is tuned to resonance with help of length A and B.

Step 2: Band's Switch is installed in position "1"- 10-MHz. RF signal (10.12-MHz) is sent to the antenna. Antenna is tuned to resonance with help of inductor L.

After the antenna is tuned to the 14- and 10-MHz matching at bands 7- and 21-MHz should be reached without any additional tuning of the antenna.

73! de UN7CI

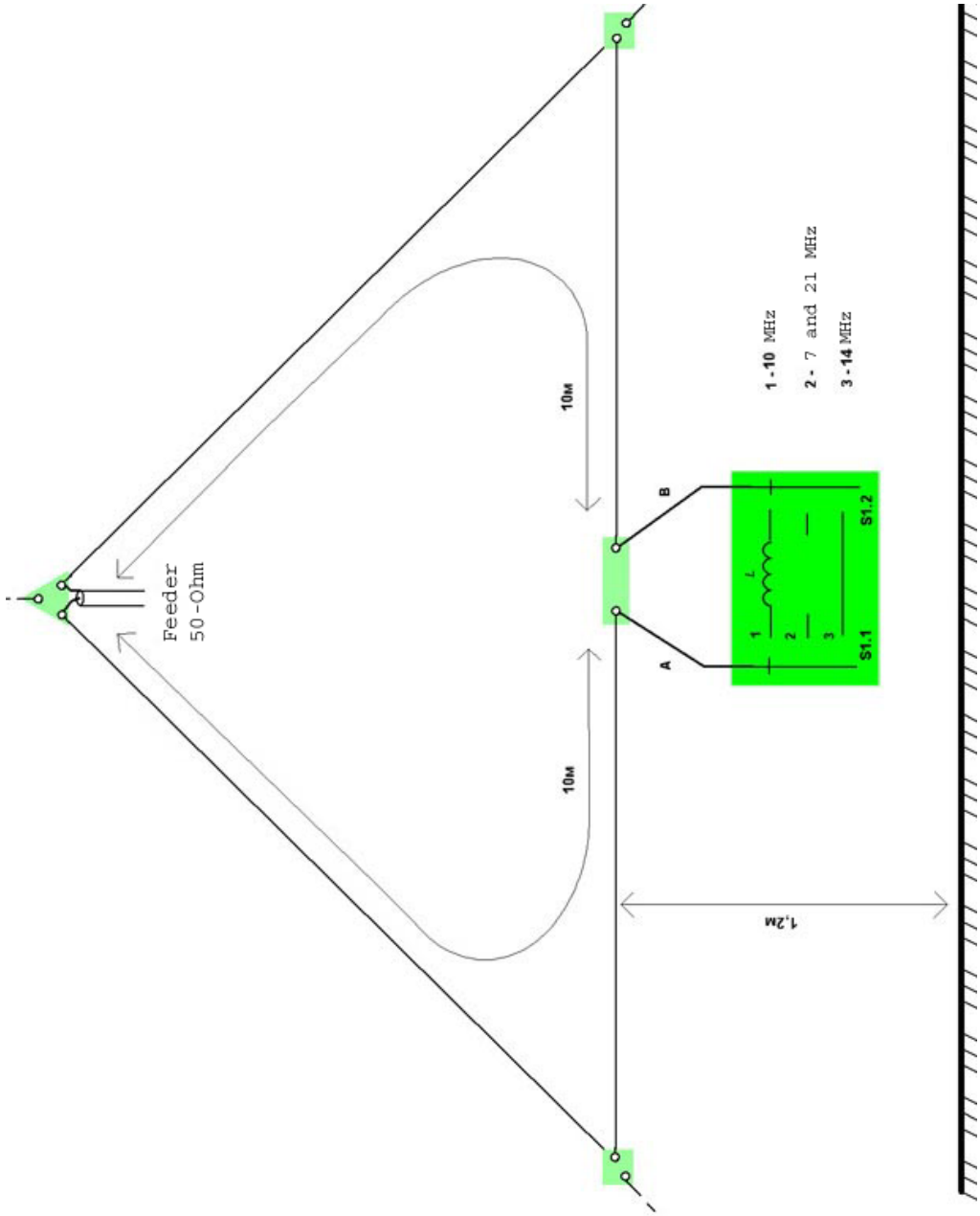

Figure 5 Design of the Four Bands Antenna