Symmetrical ATU

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Prototype of the tuner was made by VK5RG. The tuner was found by me at „Das DARC Antennenbuch“(***Reference 1***). However at the book there was given only brief description of the unit. The tuner takes my attention and by trial-and-error method I found the design (data for Inductors and Capacitors) of the tuner. **Figure 1** shows schematic of the Symmetrical ATU. Pay attention that at the tuner the rotary switches S1-1 and S1- 2 do shortening of the unused turns.

The Symmetrical ATU is kind of usual two Pi- circuits, C1 is capacitor at hot end- capacitor that tune the inductor L2 to resonance and C2 is capacitor at cold end- capacitor that does matching for the load. **Figure 2** shows design of the Symmetrical ATU.

All three inductors are placed in row. The inductors are wound by copper wire in 1.5- mm diameter (15- AWG). Inductor L1 contains 4 turns and placed between matching inductors L2-1 and L2-2. Inductors wound on a dielectric plate (PCB plate without foil) by dimensions – 150x 80x 2mm. Two row holes were drilled in the plate. The rows were 50 – mm apart and it was 3- mm distance between the holes.

At first step the inductors were being wound on to a form in 50- mm diameter. Then the dummy inductor was taken off from the form and inserted into the plate turn by turn. Inductor L1 contains 4 turns. Inductors L2- 1 and L2- 2 have 16 turns each.

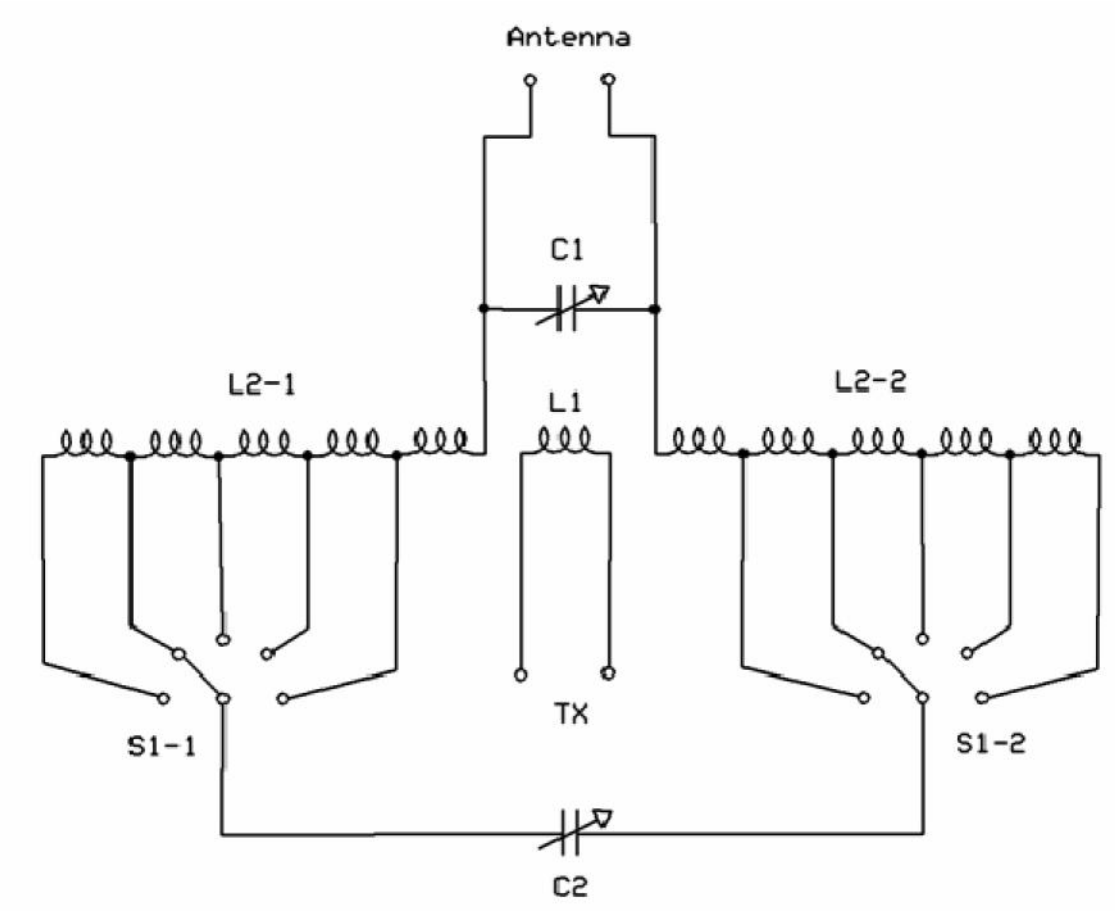

Figure 1 Schematic of the Symmetrical ATU

Taps are from 8, 12, 13 and 14- turns from ends of the inductors (see **Figure 2**). The five taps were enough to tune antenna at all amateur's bands (including WARC). Taps of the inductor L1 placed at the other side of the dielectric plate.

It was used a three – plate rotary switch at the ATU. It allowed used the ATU at high power – up to 500- Wtts. Take a look to the **Figure 2**. Taps for upper bands for L2- 1 and L2- 2 are connected to one plate (near the inductor) of the rotary switch. Taps for lower bands for L2- 1 and L2- are connected to separate plates (one plate for one inductor) of the rotary switch.

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Capacitor C1 is 500- pF air capacitor from old tube receiver. Capacitor C2 should be high quality high voltage capacitor with maxima 150- pF. For 150- Wtts going to the Symmetrical ATU it would be enough to install air capacitor with 2… 3 mm gap between plates. However when I used the Symmetrical ATU with such capacitor connected to my amplifier FL-2100 it is happened sparking between plates of the C2. Vacuum variable capacitor (as seen on **Figure 2**) installed in the ATU resolved the problem.

References

(1) Gierlach, W.: *Das DARC Antennenbuch*. DARC-Verlag, 1994

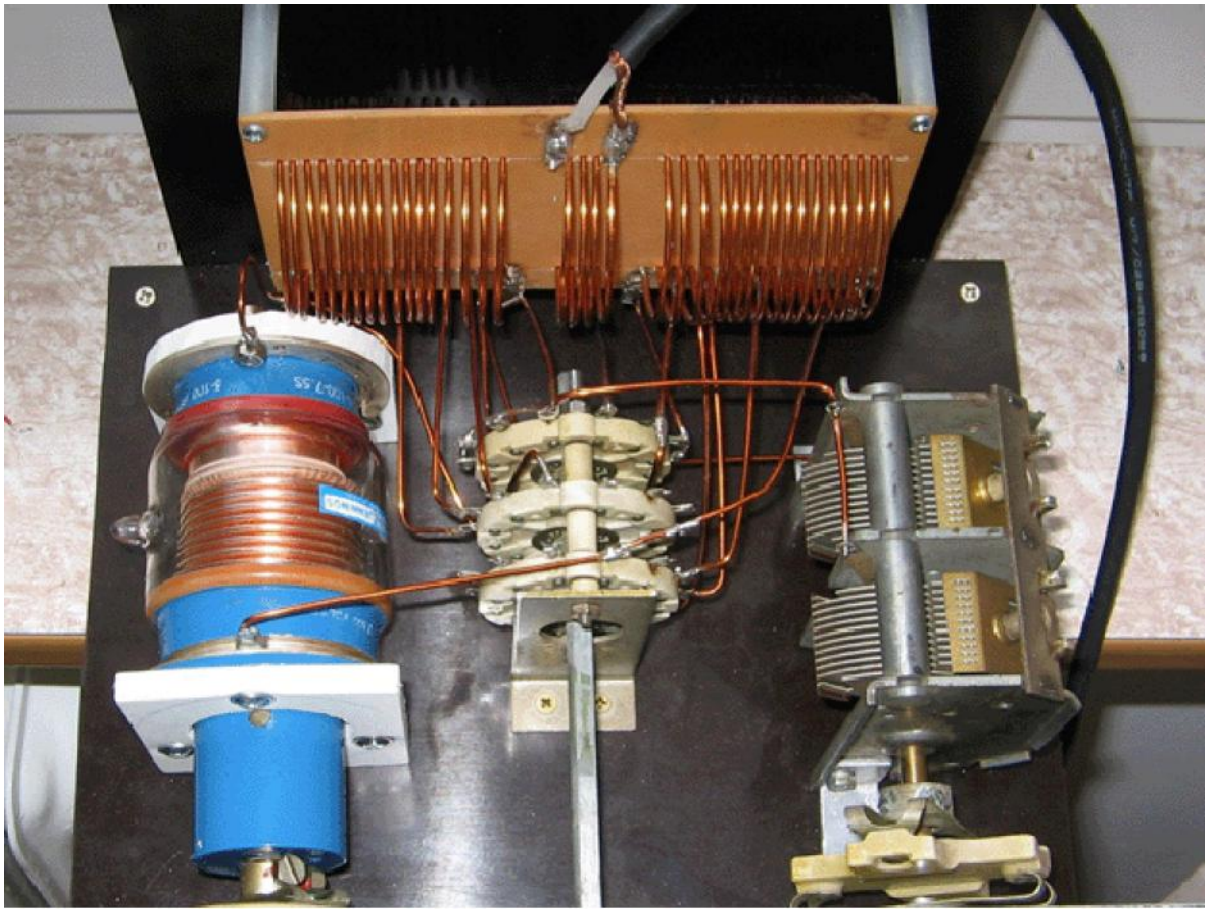

Figure 2 Design of the Symmetrical ATU

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