Power Amplifier 30W for TRX “KLOPIK”

Amplifier is assembled on PCB size 122x64 mm. The unit should be installed with the radiator. The transistor VT2 mounted (at the radiator) through holes in the Board, and VT3-VT5 (using insulating spacers). For a reliable heat contact of the transistors with the heat sink use thermal paste.

- Transformer T1 is assembled on ferrite coil 10x6x5. Winding is intertwined (2-3 twists per centimeter). Wire 0.28 mm. 2x8 turns. (see the pictures below)
- The transformer T2 – 2x2 binoculars. Assembled using four ferrite coils 10x6x5. Winding: 3 turns. wire MGTF-0.35 mm. (see the pictures below)
- Transformer T3 – binoculars 2x4, eight ferrite coils 13x5,5x5, The primary winding: 2 turns, and a secondary winding 3 turns. Wire MGTF-0,5mm.
- Inductor Dr1 - standard inductor 3 μH.
- Inductor Dr2 – Wire 0,5 mm passed through ferrite tube. (see the pictures below)
- Inductor Dr3 – Ferrite coil 20x10x7,5. Winding twisted wire MGTF-0.35mm. 2x10 turns. (see the pictures below)
- Inductors L1 and L2 are assembled on the core with a diameter of 6 mm (recommend use the standard drill 6mm). Wire 0,5mm. 9 turns. (see the pictures below)
- To improve the stability of the cascades on transistors IRF510 at the output shutter of each transistor is wearing ferrite coil 5x3x1,5

Before power ON the amplifier, you need set the position to maximum resistance on all the trimmer resistors. The adjusting starts with the installation of currents of rest of transistors (without RF signal):

- VT1 - 34 mA (resistor R4)
- VT2 - 150mA (resistor R9)
- VT3 - 250 mA (resistor R13)
- VT4 and VT5 - approximately 200 mA (resistors R16 and R17).

Capacitor C6 is a very important circuit element, largely determines amplitude frequency response of the amplifier. Adjusting of amplitude frequency response should start on 28 MHz band by selection of the capacitance of the capacitor C6, by submitting to the input of the RF amplifier voltage 100-120 mV. The amplifier output must be connected to 50-Ohm equivalent antenna using pre-configured low-pass filters. Assume that the output voltage on band 28 MHz is ~40V . Next, go to the lower frequency bands and selecting the capacitance of capacitor C6 is to achieve output voltage ~40V. Or can directly install C6 capacity 1000 pF, and compare the power output on band 3.6 MHz and 28 MHz. Maybe the power amplifier will be quite "decent" frequency response. If adjusting of the frequency response by selection of the capacitor C6 is not success, then have to install capacitors 30-50pF in parallel to the primary windings of the transformers T2 and T3

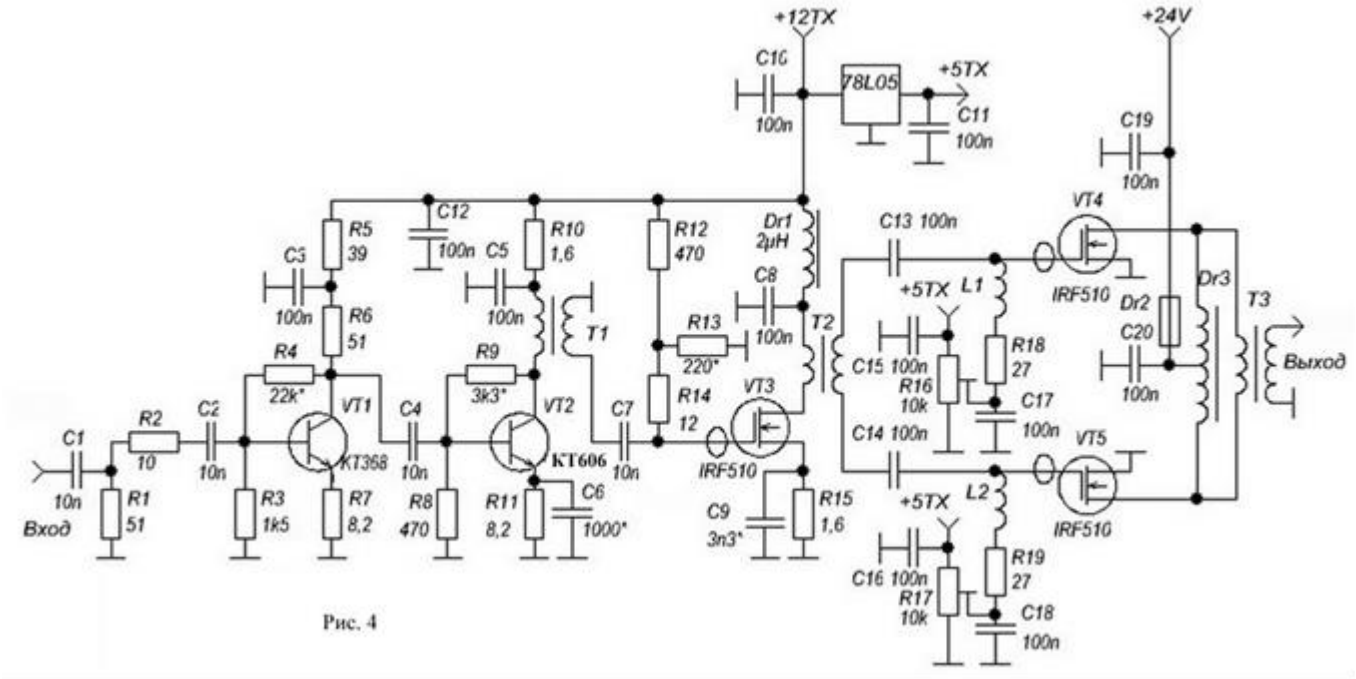


Рис. 4

Transformer T1

Required elements: Ferrite coil 10x6x5, Wire 0,28mm

1. Prepare the coil and two wires of the same length.

2. Twist the wires between each other (2-3 twists per cm)

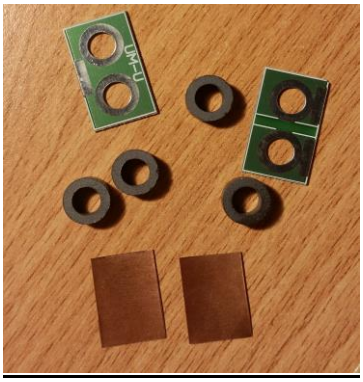
3. Make a winding – 8 rounds.

4. Remove the insulation with the wires; identify the ends of the wires and solder them to the main board.

Transformer T2

Required elements: Ferrite coils 10x6x5. Quantity – 4 pcs; Wire MGTF 0,35mm (pink); PCB for assembly T2; Copper foil

1. Prepare the coils, wire, foil and PCB. Divide the PCB to two board of the same size (by the line in the middle). Cut the 2 same pieces of foil with size 13 x 18.8mm.

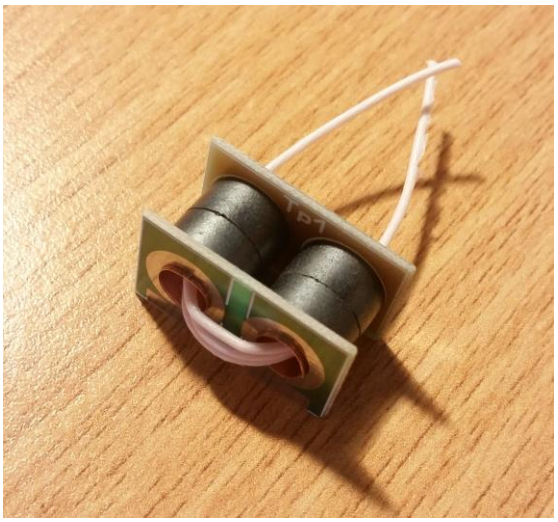


2. Maker a cylinder from the foil using the rod or the drill bit with diameter of 5.2-5.5mm

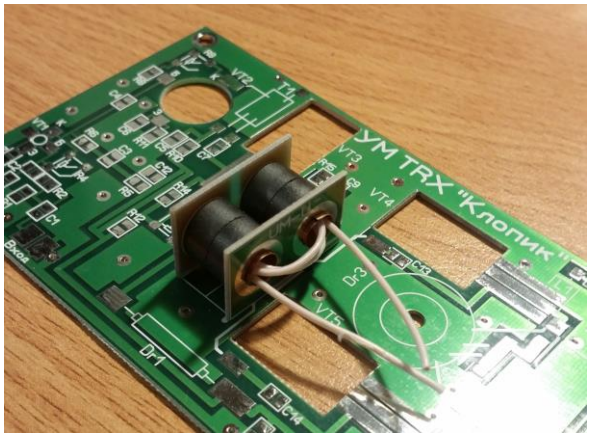
3. Merge two coils and put the cylinder's foil inside of the coils. The same procedure for the second 2 coils.

4. Construct the boards (see the picture below). The ends of the foil should be soldered to the PCB by the circle. (Coils are not soldered on the photo below!)

5. Make the winding – 3 rounds



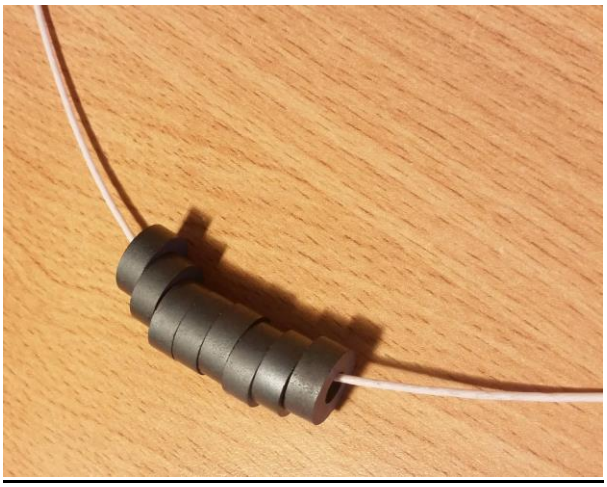
6. Put the soldered T2 to PCB and solder it at the 3 places. The ends of the wires should be soldered to the places on the PCB according to the scheme.



Transformer T3

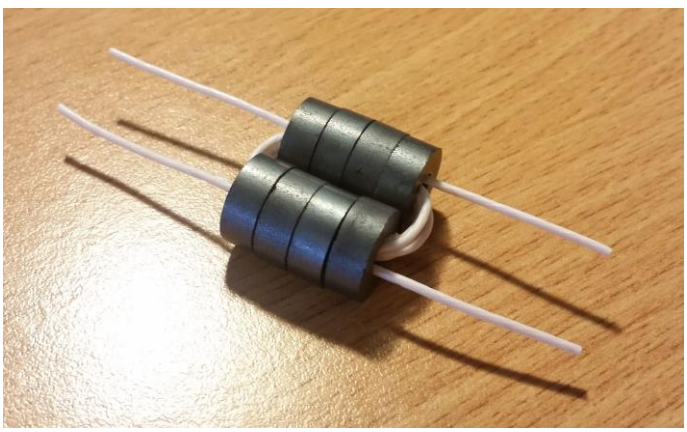
Required elements: Ferrite coils 13x5.5x5. Quantity – 8 pcs; Wire MGTF 0.5 mm (pink)

1.Prepare the coils and wire.

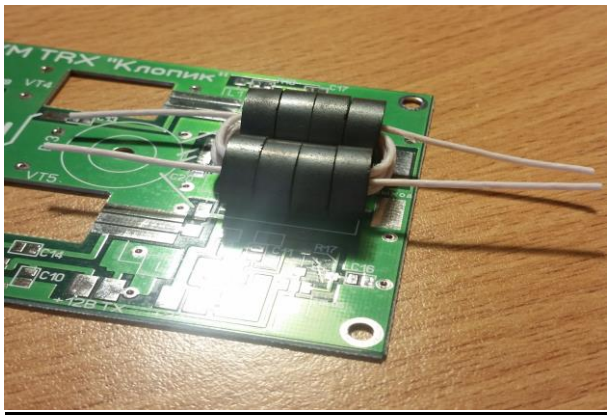


2. Make a 1st windings - 2 turns and put the coils like on the photo below:

3. Make the 2nd winding - 3 turns.



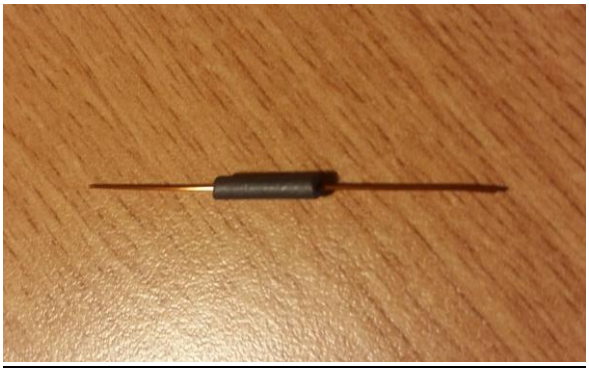
4. Put the transformer to PCB. Recommends add a hot glue for fixing the transformer on the board. Solder the ends of the windings according to the scheme



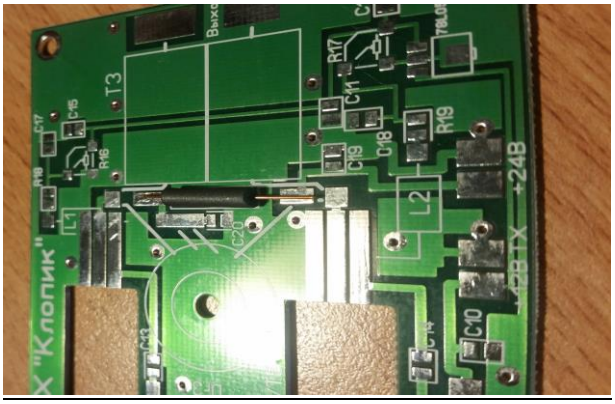
Inductor Dr2

Required elements: Ferrite tube 2,8x0,8x12; Wire 0.5mm

1. Prepare the tube and the wire. Put the wire inside of the tube. The inductor is ready.



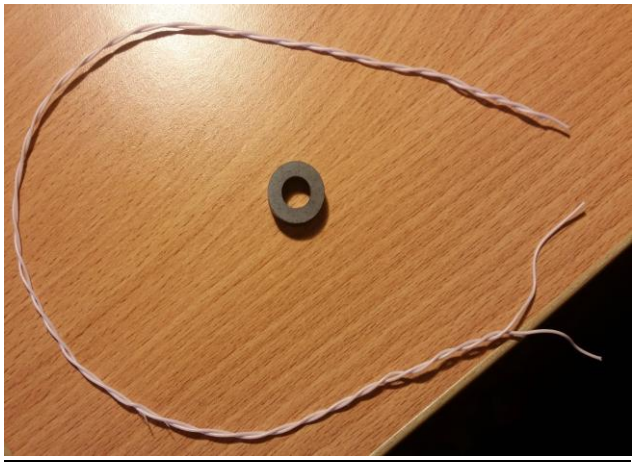
2. Solder the inductor to the main board.



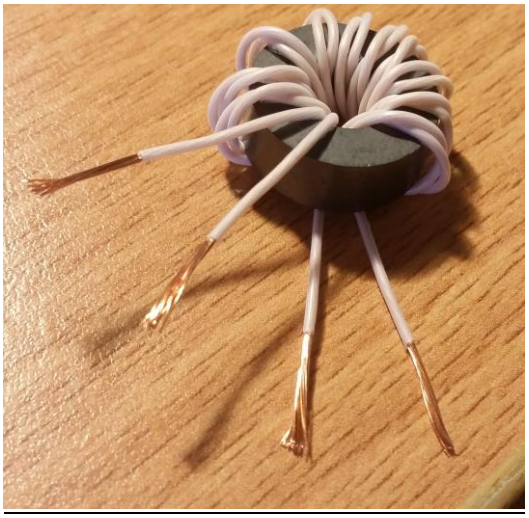
Inductor Dr3

Required elements: Ferrite coil 20x12x6.; Wire MGTF 0.35mm (pink)

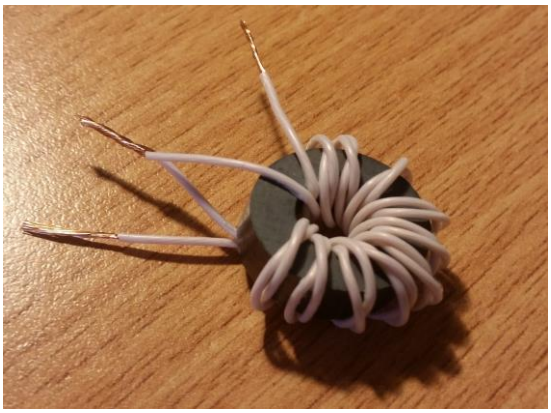
1. Prepare the coil, two wires of the same lenght. Twist the wires between each other



2. Make a winding - 10 turns by twisted wires. Remove the insulation.



3. Using the tester - Identify the ends of the wires and merge the “Beginning of the wire 2 and the End of the wire 1”

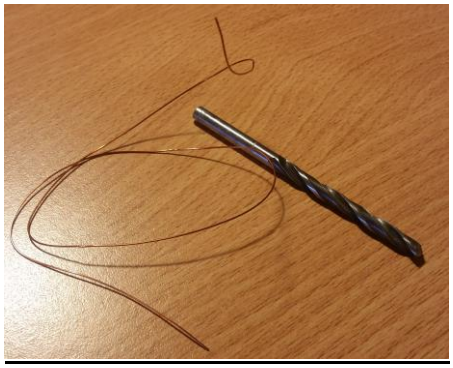


4. Put the coil to the main board. Solder the wires according to the scheme. Recommend to add a hot glue to fix the coil on the board.

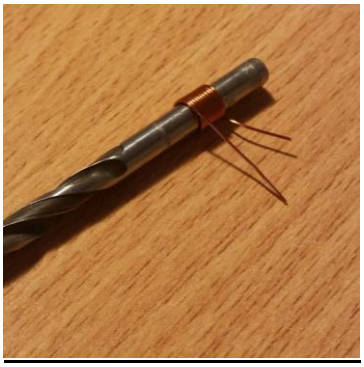
Coils L1 & L2

Required elements: A rod or a drill bit with diameter 5.5 mm (drill bit is not included to the KIT); Wire 0,5mm

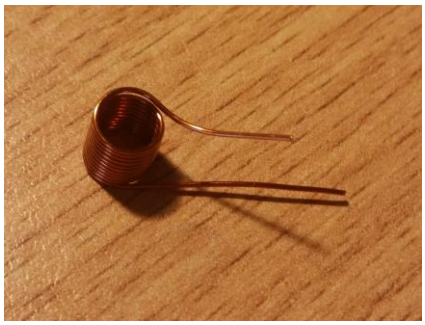
1.Prepare the wire and drill bit



2.Make a windings – 9 rounds.



3. Put off the coil from the bit and make sure that is looks symmetrically and uniformly. Make the 2nd coil L2.



4. Put the coils L1 & L2 to the main board.