

Experimental CW QRP Transceiver

Mosquito- 20m

By: A. Dolinin, UA9LAK/UN7, Baikonur

Parameters:

General

Frequencies coverage: 14,000 ... 14,200 kHz;

Supply voltage: 10 to 15 VDC

Size and weight: depend on parts, used at manufacturing.

Receiver

Sensitivity: better 1 microV;

Selectivity: depends on quartz filter

Transmitter

Power: up to 5 W (on 50 Ohm load);

Design: The block diagram of the trcv is shown on **Figure 1**. No one electromagnetic relay here, an electronic switch is used. Circuits of the rx and tx are almost independent.



A. Dolinin, UA9LAK/UN7., Baikonur

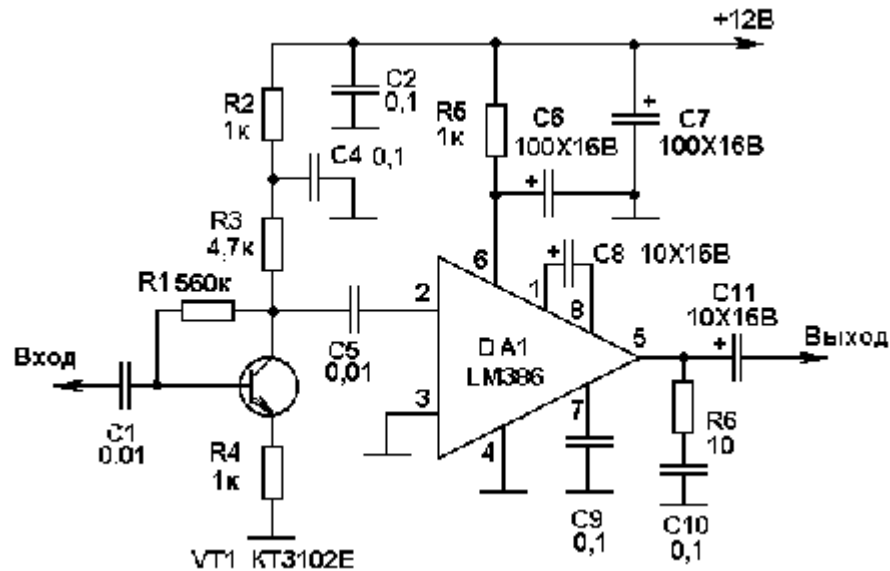


Figure 3

Audio Amplifier

Common parts are VFO and electronic switch. The trcv may be a testing area for experiments with different blocs.

Russian IC 174PS1 (international functional analog NE602 or NE612) are used in the trcv. The circuit of the receiver and transmitter (main board) is shown on **Figure 2.**

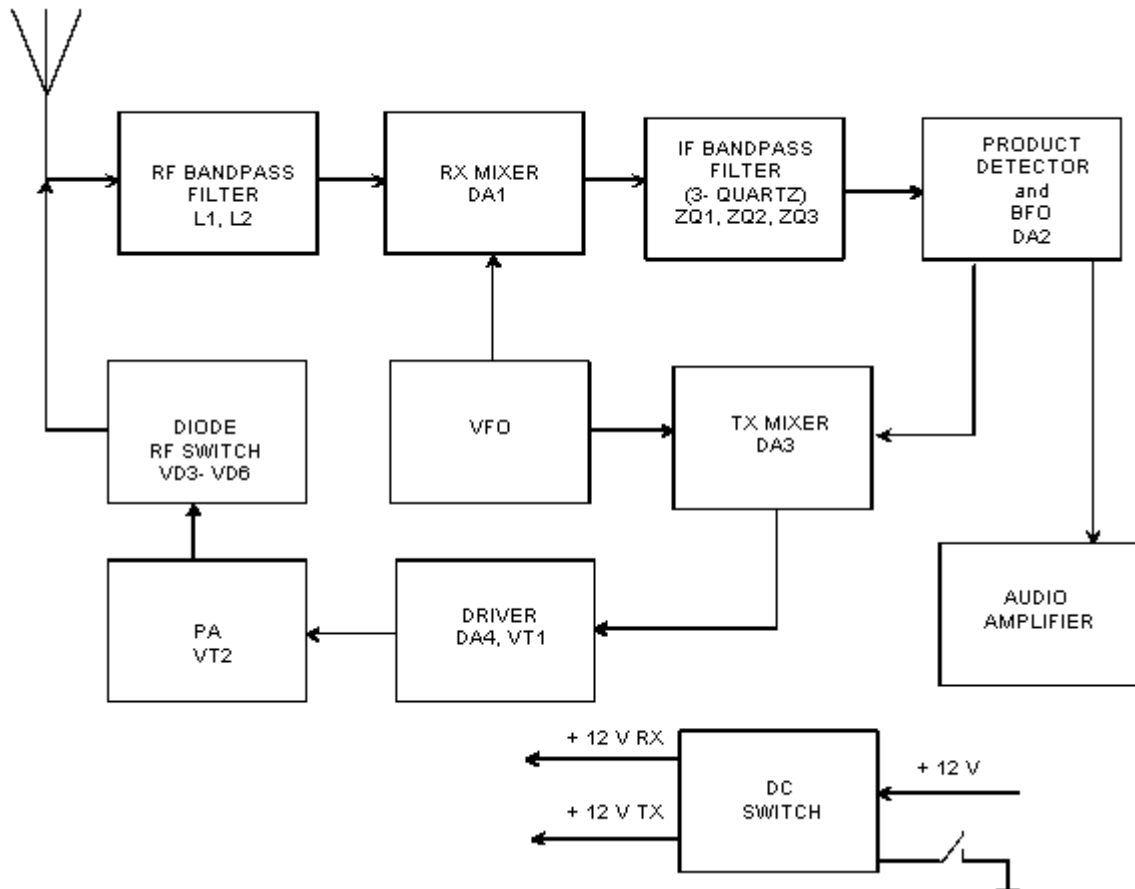


Figure 1 Block Circuit

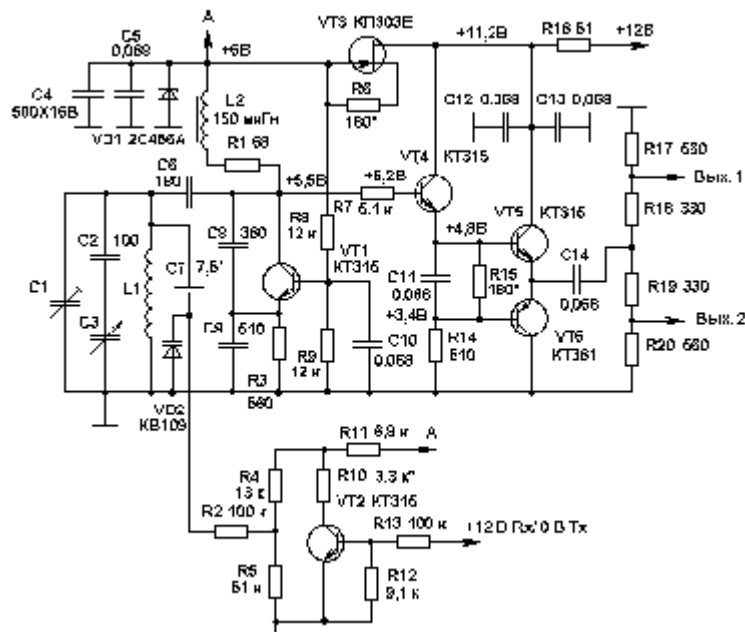


Figure 4 VFO

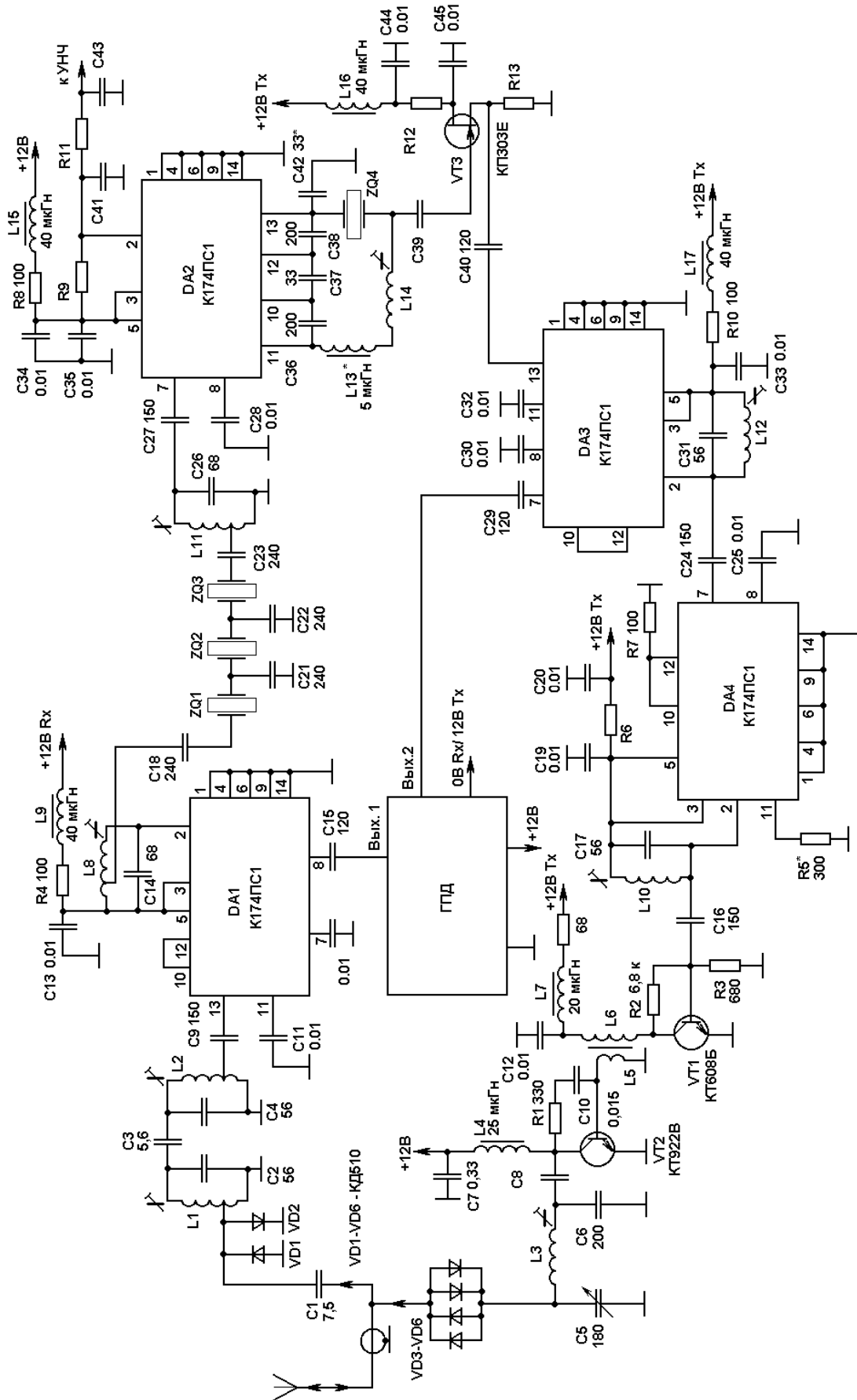


Figure 2 Main Board

Receiver. DA1 is mixer. Quartz filter is a “3- quartz filter.” I am not to do selection of quartz for using it in the filter (of course, if you have possibility to do the selection- do it). All forms for coils are from old ex-USSR VHF FM Transceiver “Len.”

DA2 is used as a CW detector and oscillator on 10700 kHz. кГц. The frequency of generation is lowered up to required with the help of RFC and L switched in serial. Audio amplifier, which is shown on Figure 3, is implemented with a low noise transistor and LM386N.

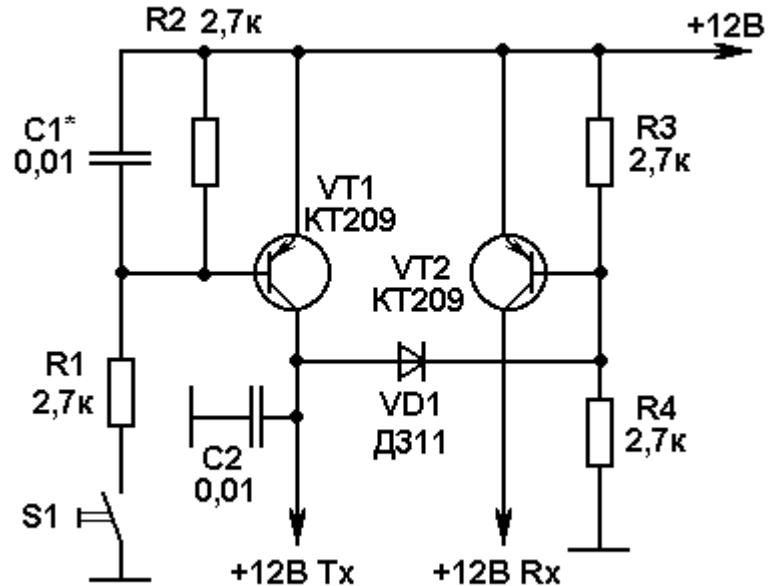


Figure 5 Electronic Switch

Transmitter: L5 (3 turn)/L6 (10 turn) are coiled on a ferrite ring, international analog FT- 37-63, by 0.3 mm wire (28 AWG). Each coil is sitting on its half of the ring. L3 5 turns wire in 0.5 mm or 24 AWG) is coiled on a form in diameter of 7 mm.

VFO: Figure 4 shows the VFO. This one is borrowed by me from “DC Receiver for the 20 meters” by B. Stepanov, (RU3AX). However I added a frequencies shift (VT2). This one needed for SSB/CW QSO. VFO coil is wound on a ceramic form in diameter of 10 mm and contained 45 turns. All capacitors are high quality ones.

Electronic switch: Figure 5 shows the Switch. Borrowed from Ukraine radio magazine “Radio- Hobby” # 1, 2000.

PSB: I did not design a PSB for the transceiver. I did it by “ugly” montage. Each block is mounted on the own board. Fully assembled and tuned boards are soldered at corners to transceiver case.

Adjustment and Tuning: Nothing special at tuning the unit. Do adjustment from Audio Amplifier, then Receiver and Transmitter.

Commentary to VFO Board:

KT315, KT361- Low Power RF Transistor, 250 MHz, 300 mW
 КП303Е – Low Power RF FET Transistor
 VD1 – Zener Diode, 5V
 VD2 – Varicap, 10- 30 pF

Commentary to Main Board:

174ПC1 = NE602, NE612
 КД510 = High Speed RF Switch Diode
 KT606Б = RF Power Transistor, 300 MHz, 1 W
 KT922B- RF Power Transistor, 300 MHz, 10 W
 мкГн = micro Henry
 КП303Е – Low Power RF FET Transistor
 0В= 0 V
 12 В= 12 V

Commentary to Switch Board:

KT209 – 400 mW Switch Transistor
 Д311 – Germanium Diode



Transceiver Mosquito 20m