

Simple Short Wave Receiver

V. Egorov, UA3AB

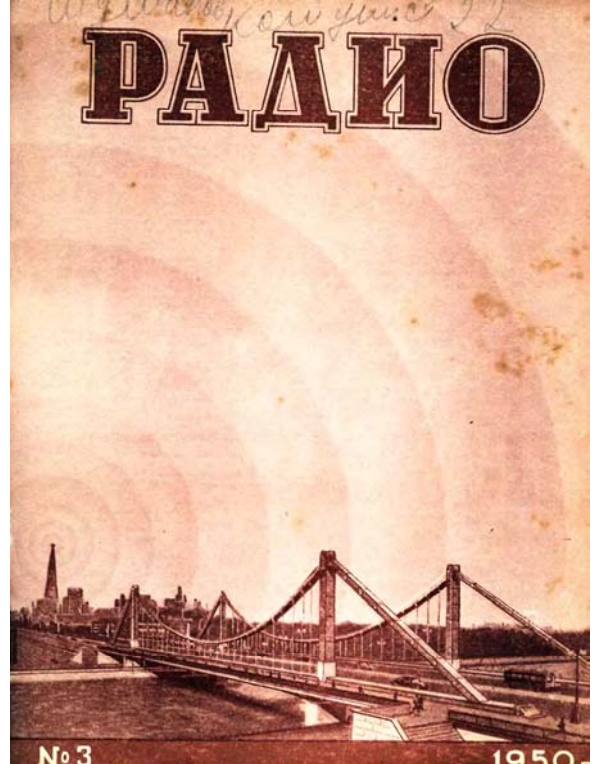
Credit Line: Radio # 3, 1950, p.p.: 37- 40

Note from va3znw: It was the first tube regenerative receiver that I have made by myself. At the far times I was a thirteen years old boy that fall into radio and certainly into amateur radio. I already made a transistors' then tubes' HF converter for my old tube receiver "Muromets." So, I could hear amateur stations.

However, one friend of mine, old ham (he was at the times in his forties) told me about my converters:- "Good job! But.. what I would like to say... all the stuff (converter and receiver) you may change for one tube receiver. It would get the same reception."

Another day he gave me an old soviet magazine "Radio" with the schematic. When the receiver was made and tuned, I discovered that the one- tube receiver really worked almost similar to converter with "Muromets." Later I made several tens such receivers for 16- 13- meters but for receiving "Voice of America" and "Radio Liberty." The stations were jammed in the USSR, but there were not jammed at the 16- 13 meters because the bands were not at the receivers produced in the USSR. I ever recorded some music from the stations. At the 70s the stations sounded at 6- 13- meters band similar to FM stations.

After that first regenerative receiver I made lots different regenerative receivers, both transistor and tube. I made lots superheterodyne and DC receivers. But I still remember that old Radio with shabby cover with rosin on the pages border, with some strange pencil-notes on the pages border, and that one tube receiver that by some miracle worked like a big superheterodyne ... and that exiting feeling while tuning the capacitor's knob...



Front Cover
Radio # 3, 1950



6N8S (6H8C in Russian)

Трехтрубный
КОРОТКОВОЛНОВЫЙ
приемник

V. Egorov (UA3AB)

Title of the Article

Schematic

It is a regenerative receiver assembled on a double triode tube. One triode is a regenerative stage another is an audio stage. **Figure 1** shows schematic of the receiver.

For pictorial view some parts are shown in drawn view.

L1C2 is input circuit. Antenna is connected through a small capacitor C1. High- Ohmic headphones is directly connected to plate circuit of the triode.

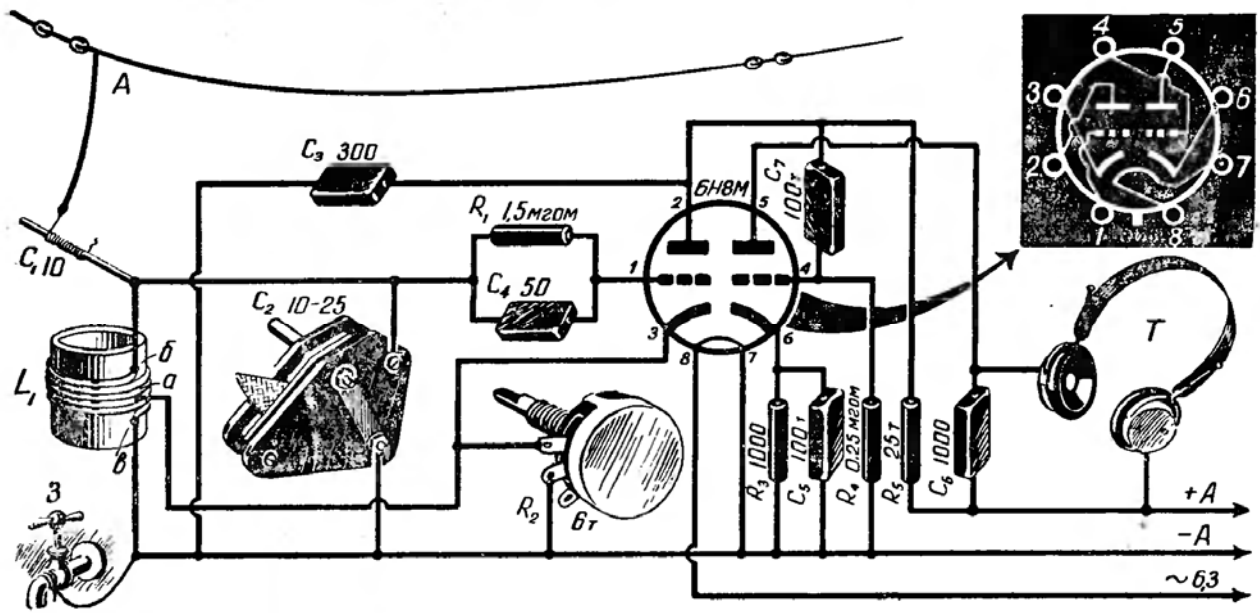


Рис. 1

Figure 1 Simple Regenerative Receiver

Parts and Design

Inductors of the receiver are wound on the tube base of old tube UO- 186 or V0- 188.

Note of va3znw: At the time (70s) my friend gave me some old defective tubes UO- 186. I used the tube base for inductors for my receiver. Today, in Russia, good UO- 186 tube made in 40- 50s may cost (for audio- fans) almost 100 USD.

Inductor for the 40- meter has 19 coils. It is wound "turn to turn" by wire in diameter of 0.8- mm (20- AWG), tap made from 7s coil from the cold end. Ends and tap of the inductor are soldered to the pins in the tube base. .

Inductor for the 20- meter has 9 coils. It is wound by wire in diameter of 1.0- mm (18- AWG), tap made from 3d coil from the cold end. Between wires is wound a thick tread to provide gap in 0.3- 0.4- mm. Ends and tap of the inductor are soldered to the pins in the tube base.

The Plug- In inductor for needed band is plugged to socket installed on the receiver chassis.

Figure 2 shows the regenerative receiver and plug- in inductor. **Figure 3** shows the plug- in inductor at the receiver chassis.



UO- 186

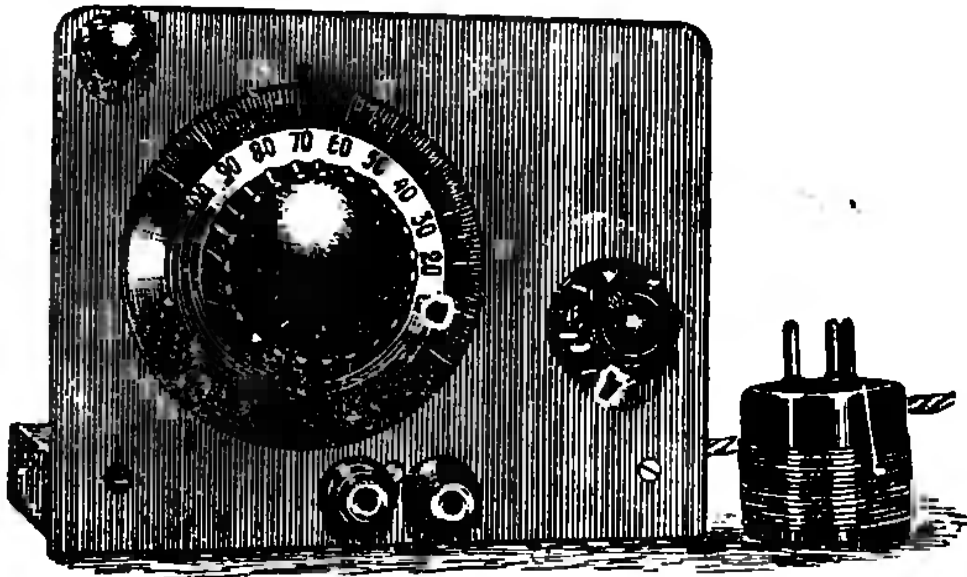


Figure 2 Regenerative Receiver and Plug- In Inductor

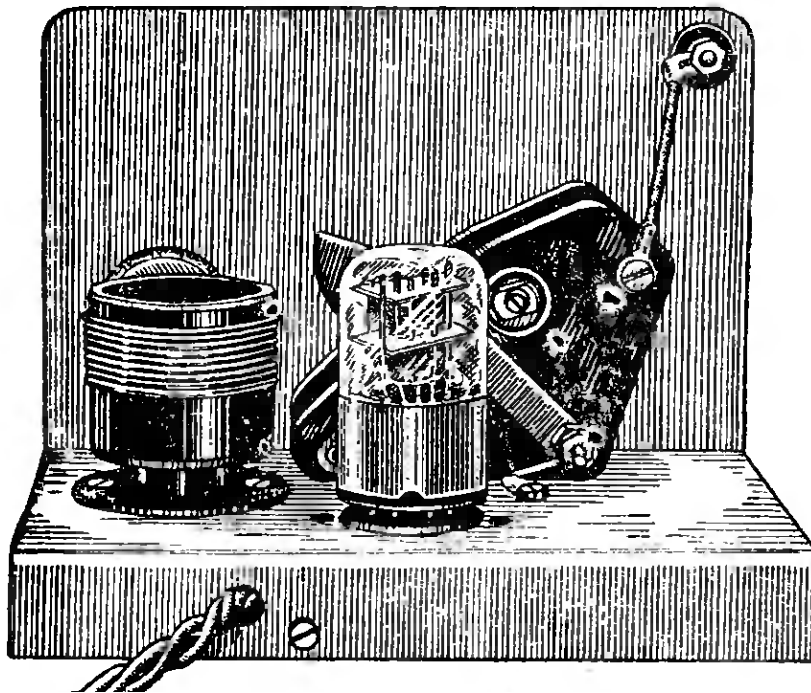


Figure 3 Plug- In Inductor at the Receiver Chassis.

Capacitor C1 is very important part for good job of the regenerative receiver. Best choice is to use a variable capacitor up to 5- 10-pF. However at this receiver a home- made capacitor is used. It is done in very simple way.

Insulated wire in 0.3- 0.5- mm (24- 29-AWG) (one capacitor plate) is coiled (possible with one turn of thin paper) above wire in 1.5- mm (15-AWG) (another capacitor plate) on the length 8- 10-mm. Capacity of the capacitor could be changed by winding/unwinding thin wire.

Resistor R2 may have resistance from 2-kOhm to 15- kOhm. Important thing- it should be quality made.

Resistor R1 may have resistance from 1- mega-Ohm to 2- mega-Ohm. Resistor R3 may have resistance from 1- kOhm to 1.5- kOhm. Resistor R4 may have resistance from 100- kOhm to 500- kOhm. Capacitor C3 may have capacitance from 200- 1000- pF.

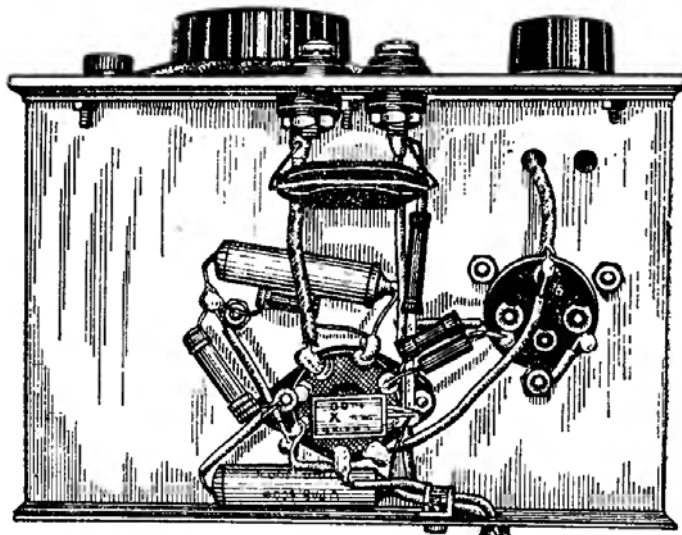


Figure 4 Montage of the regenerative receiver

Capacitor C4 may have capacitance from 50- 100- pF. Capacitors C5 and C7 may have capacitance from 0/05- 0.2- microF. Capacitor C6 may have capacitance from 500- 1000- pF. Almost any double triode should be used in the receiver. Figure 4 shows montage of the receiver. It made by insulated wire in 1.5- mm (15- AWG) diameter.

Power Supply

The receiver needs for plate any high voltage in range 100- 200-V DC. Receiver consumes 5- 10- mA at plate circuit. For tube heater the receiver needs 6.3- V AC. Figure 5 shows power supply for the receiver. However it is possible to use any power supply that can be provide above mentioned parameters.

Adjustment

The first it needs to check generation at the all working bands. For the checking receiver turn on without antenna and with help of R2 the receiver is turned on to generation mode. At the generation mode you may hear whilst in the head- phones. If you will turn slowly the dial of the C2 you may hear (in generation mode, without antenna) strong (in the area) signals of CW stations. Then turn on antenna to the receiver (that is stayed in generation mode). The antenna should not break the generation. If the generation is broken it needs to decrease capacity of the C1. If it is not help or help a little- try to change tap from the L1.

After optimum C1 and optimum tap is found it is possible to calibrate the receiver. For this you may use or special RF- Generator or another receiver (to receive generation of the regenerative receiver).

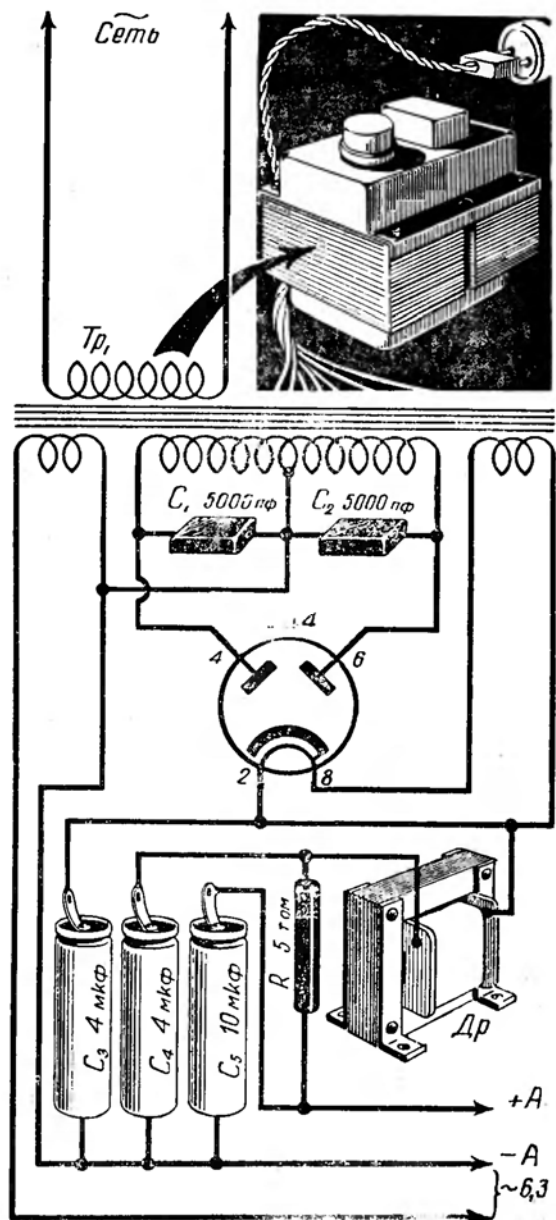


Figure 5 Power Supply for the Regenerative Receiver