

Tube AM Radio Station for the 160- meters

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Technical Data:

TX: Output RF Power not less the 3 Wtts

RX: Sensitivity not less the 2 micro- V

The radio station consists of from a separate receiver and transmitter. **Figure 1** shows schematic of the AM radio station.

.Transmitter: It is made on VT1, VT2, VT3, VT7. VT1 is a voltage stabilizator for VFO (made on VT2). L1C1C2 should be covered frequencies 900-980-kHz. L2C5 is tuned on 1900-kHz. VT3 is PA for the transmitter. L3C2 and S3 is ATU for the PA. The circuit should match antenna having Z from several Ohms up to several kOhms with the PA. S1 is switch for tuning VFO to calling station. S2 is switch to change mode AM/CW. VT7 is audio modulator of the TX. At AM –mode the PA tube VT3 is switched to bridge with VT7. At TX relay K1 is switched high voltage to PA and shortened the 3-rd grid of the VT3 to the ground.

Receiver: It is made on VT4, VT5 and VT6. VT4 is a voltage stabilizator for the RX. VT6 is RF- amplifer for the RX. L7C23 is tuned to 1900- kHz. Serial L6C20 as well is tuned to 1900- kHz. Double triode VT5 works as regenerative detector (left triode) and Audio amplifier (right triode). L5C18C19 should be have high Q, so, coiled by quality copper wire and C18 and C19 should be air –gap capacitors. R14- RF Gain, R6- regeneration level.

Parts: For Data for inductors see **Table 1**. All resistors may have tolerance 30%. Wide range of tubes may be used at the radio- station. Any low power pentode may be used for VFO. Any pentode that can give out 5-10 Wtts may be used at PA. Tetrode as well may be used for PA. In that case RX input connected through capacitor in 10-pF to anode of VT7, contact K1.1 of relay K1 is connected to bridge with L7C23 (so at TX mode the input is shortened to the ground).

Table 1 Inductors Data of the Radio Station

#	inductance, microH	OD, mm	Length of winding, mm	Numbers of turns	Wire	Note
L1	50	20	20	60	0.2 mm/32-AWG	
L2	40	20	20	53	0.2 mm/32-AWG	
L3	30	34	40	38	0.8 mm/20-AWG	Tap to plate of VT3 from 30 turn from “cold end.” 11 taps to S1 from each 3 turn beginning from 4- turn from the “cold end.”
L4	5	36	10	6	0.5 mm/24-AWG	
L5	100	34	35	60	0.3 mm/28-AWG	
L6	20		10	25	0.3 mm/28-AWG	
L7	40	20	20	53	0.2 mm/32-AWG	
RFC1, RFC2				400	0.1 mm/37-AWG	Bulk on Russian resistor WS-2, resistance more the 51-kOhms. For the resistor see Transceiver SQT, Antentop # 1, 2008.

Glow-discharge stabilatron VT1 and VT2 may have voltage 80- 150-V. Any low power double triode may be used at receiver (VT5). Any low power RF-pentode may be used at VT6.

Coil L4 may be moved along L5. It is need to get optimal regime for the regenerative receiver. **Figure 2** shows the design of the receiver's coil. Relay K1- any suitable relay. R18 limited current through the relay.

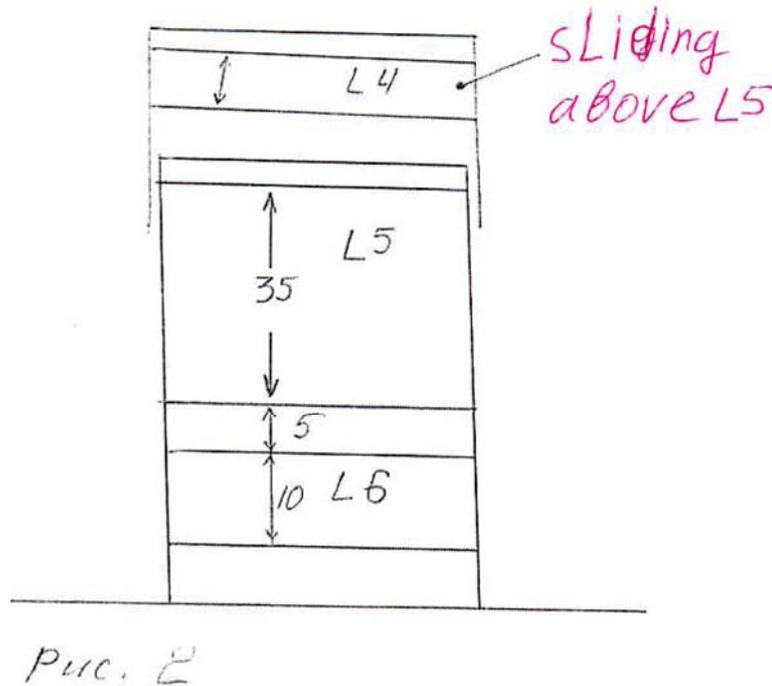


Figure 2 Design Coil of the Receiver

Tuning of the Radio Station

The tuning is simple and takes one evening if the radio station is made from right parts that are installed in correct way.

At first do tuning of the receiver. Receiver should receive something with antenna at least 3 meters long. Tune L3C12S3 for the best receiving. With help C19 set the receiver to the middle of the 160-meters band. Be sure, that C18 covers all 160-meters band. R6 should provide a smooth regeneration control. If not, change the distance along L4 and L5. If it is no regeneration, switch visa versa terminal of L4 or decrease distance between L4 and L5. Set the receiver in the middle of the 160s and tune L6C20 and then L7C23 on to maximal sensitivity.

The second, do set up of the transmitter. Begin from the VFO. Using MW receiver set the VFO to 900- kHz (300-meters). Load the transmitter to a 50-Ohm/10-Watts resistor or bulb having resistance in range 50- 300- Ohms. Adjust doubler L2C5 on to maximum output power of the PA. Audio amplifier/modulator works straight away at right parts. Audio transformer T1 was used from an old tube receiver.





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Design of the Radio Station

However, it is very possible to use almost any old tube receiver to be remade in the Radio Station.

Design of the Radio Station is shown on the **Figure 3**.

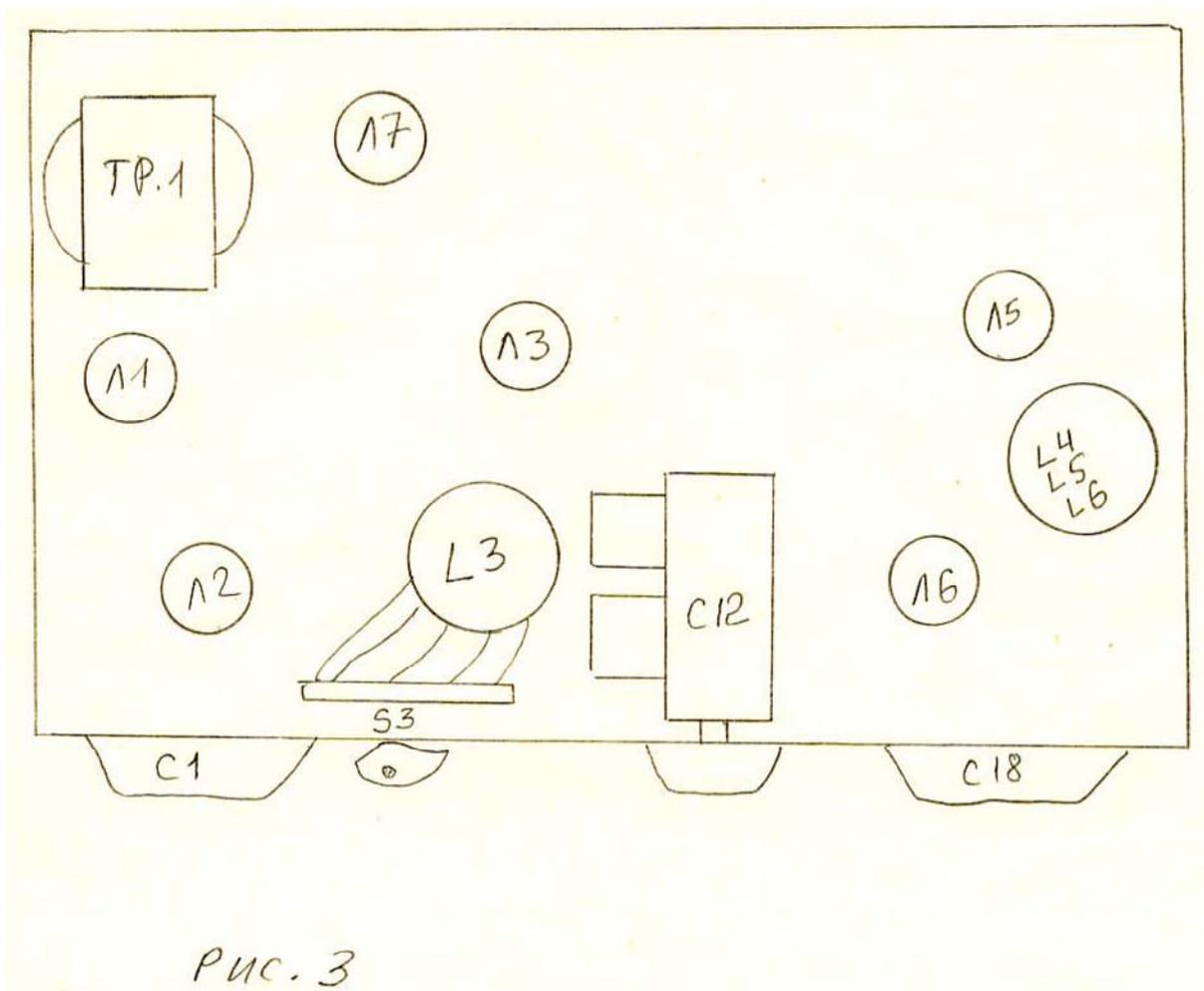


Figure 3 Design of the Radio Station

References

1. Newspaper "Soviet Patriot" from September 12, 1979 and December 12, 1979.
2. Radio №9 1980, V. Grushin (RA3ANW), AM Transmitter for the 160- meters;
3. Radio №9 1979, V. Grushin (RA3ANW), Simple AM Transmitter
4. Radio №4 1980, Y. Lapovok, Transceiver for the 160- meters
5. Radio №10, №11 1982, V. Polaykov, DC Transceiver for the 160- meters

