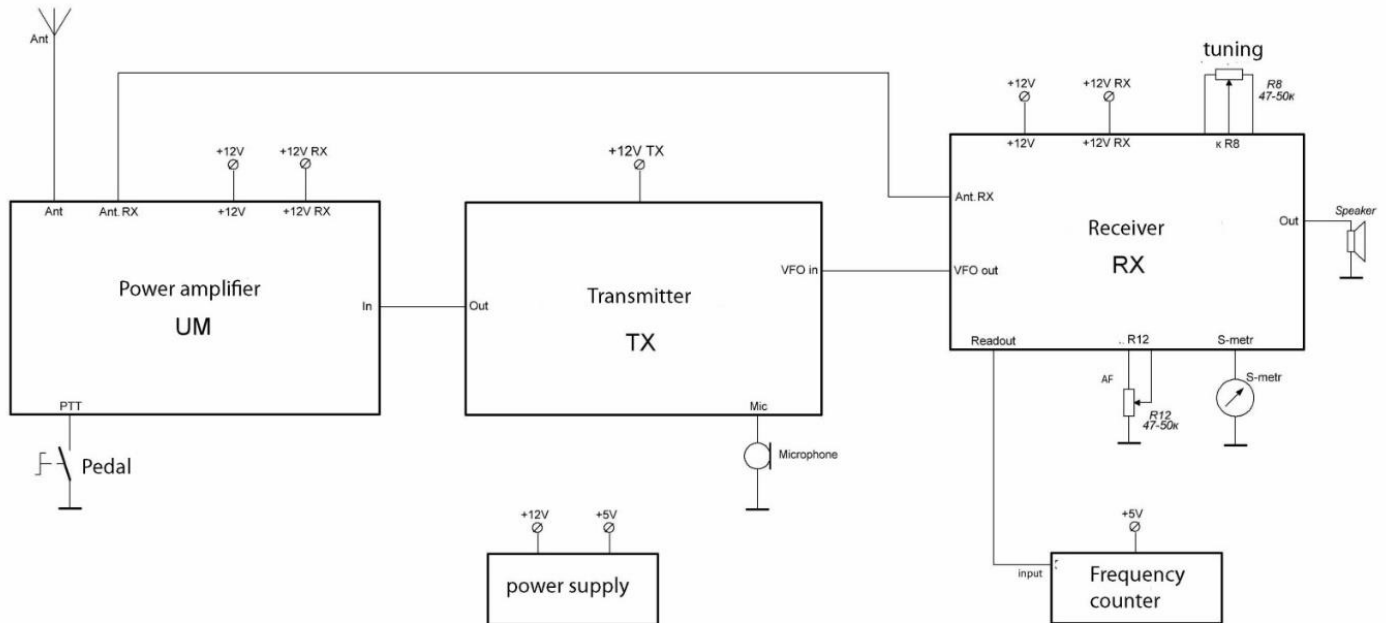


HF Receiver Taurus-80

Transceiver "TAURUS"

The QRP transceiver "TAURUS" is designed to operate in SSB on the 80-meter band (3,5...4,0 MHz) with an output of 4-5 watts. The diagram of the transceiver shown below. The transceiver is splitted to four independent units: the receiver (RX unit), the transmitter (TX unit), power amplifier (UM unit) and digital counter (frequency meter with LCD). Each unit can work independently from each other, or can be used with other transceivers.



Operating of Receiver "TAURUS-80"

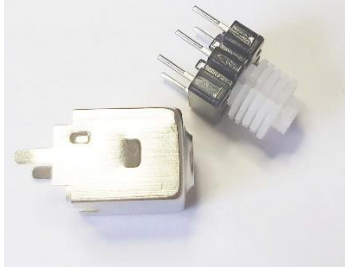
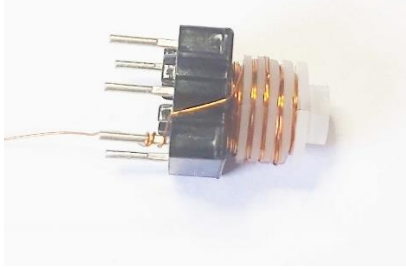


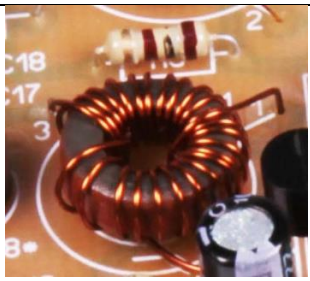
Diagram of the Receiver "TAURUS-80" is shown on picture on separate page.

- Two MOSFET: VT1 (J310) and VT2 (J310) are RF Amplifier.
- A core of Receiver is DA1 (MC3362P): VFO, 1st mixer, IF amplifier, BFO, SSB demodulator.
- AGC is designed on the transistor VT3 (2N3904) and diodes VD2 and VD3 (1N4148).
- The AF amplifier is designed with the popular LM386 (DA2). The output of LM386 is connected to the speaker 0.25W, 8 Ohm.
- 4x quartz crystal filter is assembled on four crystals Z2-Z5 8.867 MHz. The same crystal Z1 is used in reference oscillator (BFO), but its frequency is shifted down using the inductor Dr4 and by trimmer capacitor C40.
- VFO frequency works on 5.070 - 5,370 MHz by tuning of multi-turn potentiometer R8 10-50K and changing the bias on the varicaps VD4 and VD5.
- The bandwidth of the input bandpass filter at L2,L1 and L3,L4 and the load circuit in the HF amplifier T1 must be in range 3.5...3.8 MHz.

The PCB dimensions are 130x50 mm. The Receiver is a very easy for assembly and starts working with a "long wire" antenna just of few meters. The stability of VFO is enough to listen to the stations. After a short time of warming up, the reception frequency could be changes to ~100Hz for 30 minutes.

Assembly details

1. If you have NWT, Scope or RF voltmeter - we recommend to build the Receiver step by step starting from building and adjusting of bandpass filter, then T1, crystal filter and then build VFO and other elements. It would help to easily adjust the receiver during the first power on.
2. If have no such devices, than build the Receiver by accurately soldering the elements according to diagram.

Element	Assembly details	Inductance	photo
L2&L3 and L1&L4 – bandpass filter 	L2, L3: 5mm shell – 2pcs. Wire 0.12mm. 45 turns (9 turns in each section). (length of wire ~100cm). Using a knife clean the ends of wire and fix them on pins by solder pen. L1 & L4 Wire 0.12mm. 3 turns. Over L2, L3. In the middle of existing winding. Using a knife clean the ends of wire and fix them on pins by solder pen. Put the shields and ferrite cores to inductors.	~9,3μH of L3 and L3 (in the middle of a core)	
L5 – VFO 	T50-6. 36 turns. Wire 0.35-0.4 mm	~5.1μH	
Transformer T1 	toroid T37-2, wire 0.28mm (length ~40cm). 39 turns. Start of the winding is pin 3; the end of winding is pin 4. Then, do one more winding over the existing winding. 3 turns by 0.35mm. Connect the ends to Pin 1 and pin 2	~6.2μH	

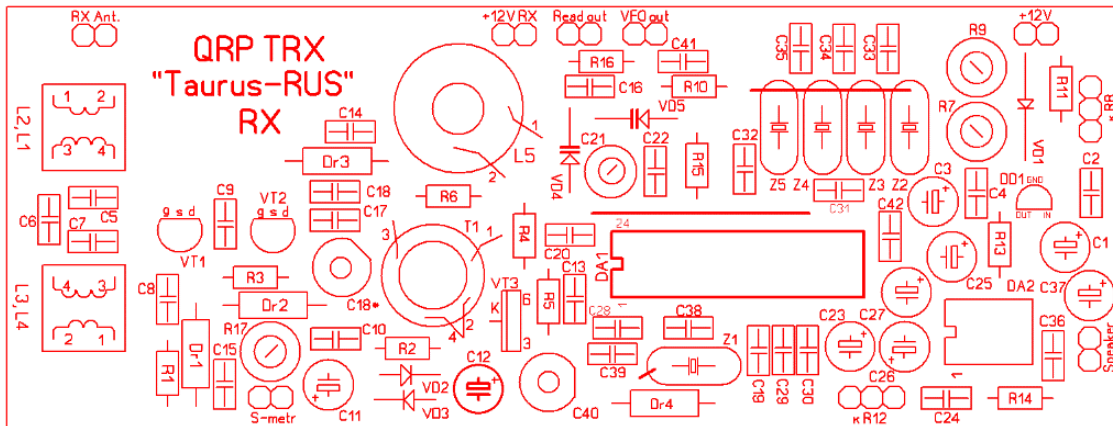
Prepare the Receiver to first power ON

1. Connect R8 and R12 potentiometers and 8 Ohm speaker or headphones to board.
2. Power on the Receiver by applying +12V to input pin.
3. If everything is OK (nothing heating, the current is <50mA), then apply +12V to “+12V RX” input pin.
4. Make sure that nothing heating and current is <100mA. You should listen to noise in speaker (test volume by R12) and the noise of air should be changed while tuning by R8.

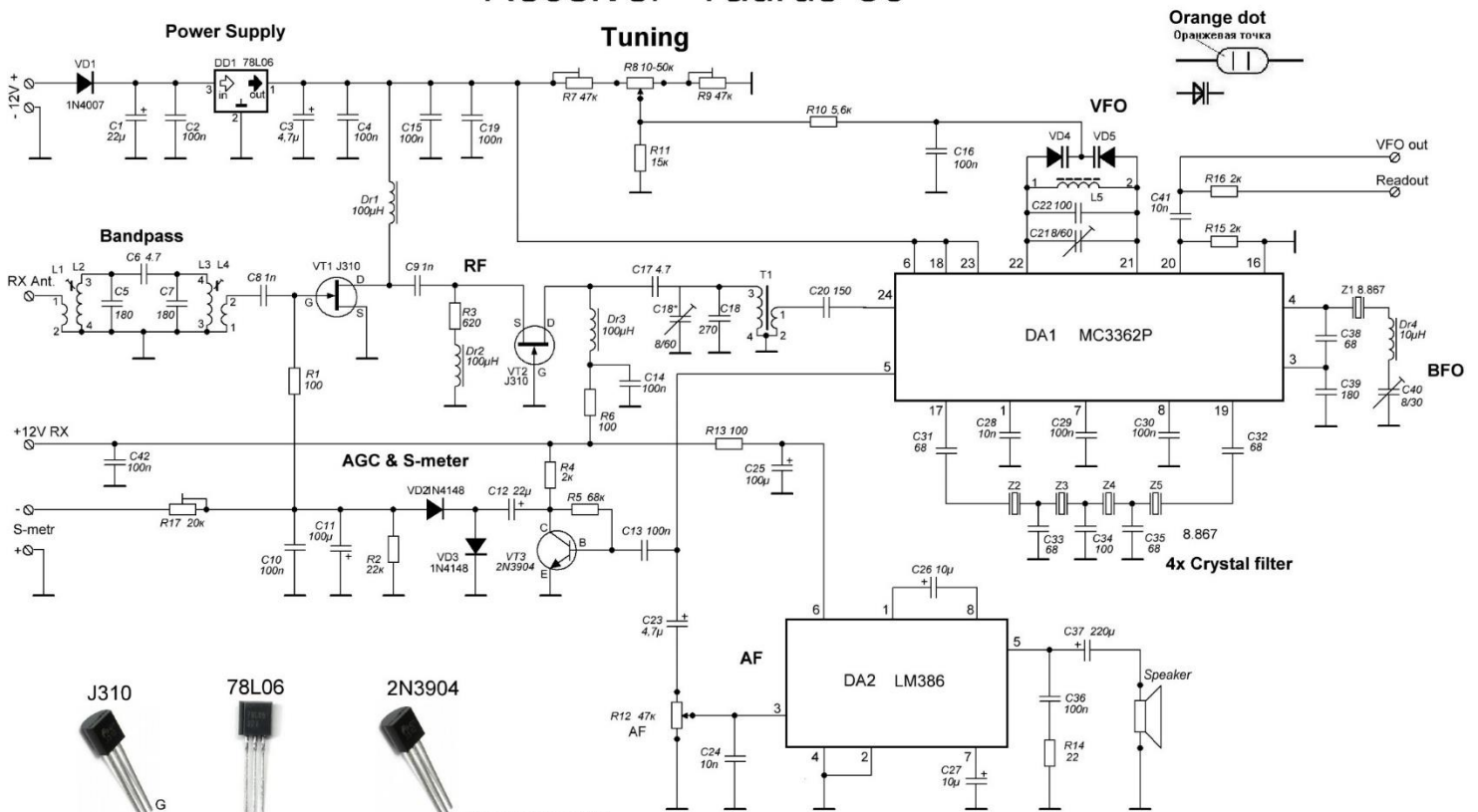
Calibration

1. **VFO** needs to get its working range: 5.070 - 5,370 It is comfortable to do by using the frequency counter – connect it to VFO Out (2 pins on board). By tuning L5 coil and trimmer resistors R7, R9 and capacitor C21 do the range 5.070 - 5,370 MHz.

- Bandpass filter:** BPF should pass the signal in range 3.5-3.8 MHz. Make sure that ferrite cores in the middle position (just 2-3 turns). The fine adjustment of bandpass would be done after next step.
- RF Amplifier** – put the frequency in the middle of the band (For example, 3.6 MHz). Adjust C18* trimmer to get maximum of noise of air.
- Make the fine tuning of bandpass filters – it should also have maximum noise on the band.
- As RF amplifier and Bandpass are ok – it is time to connect the Receiver to antenna (or generator) to test the working path of Receiver. Tune the Receiver and find the strong signal from station. The voice could be inaudible.
- BFO:** Adjust the C40 to get the right shifting of the quartz filter. It allows to listen to stations and understand the voice.



Receiver "Taurus-80"



RX diagram