

# Transceiver Fetter - 80

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Credit Line: CQ- QRP # 31

The transceiver is a practical implementation of the theoretical schematic made by RA3AAE [References 1, 2]. Transceiver was made on a piece of PCB of suitable sizes. Transceiver was made on 80- m band however, this one may be tuned to another ham band. **Figure 1** shows schematic of the transceiver. The transceiver took part at MAS contest [References 3, 4], so parts at the schematic labelled according to MAS rules. According to the MAS rules the transceiver has only 36 components and it belongs to category "A36."

Data:

Supply Voltage: DC, 10.0... 14.0- V  
 Consumer Current RX/TX (at 12.0- V): 15.0... 20.0- mA / 0.5- 0.7- A  
 Frequencies Range: 3500... 3580- kHz  
 Sensitivity (at 10- dB S/N): near 10.0- microV  
 Output power (at Dummy Load 50- Ohm): near 3.0- Watts

**RX mode:** Signal from Antenna WA1 through low-pass filter L2, L3, C3, C6, C8, C9 is going to mixer on VT3, VT5. RF from the VFO on VT1 goes to the buffer on VT2 and then is going to the mixer on VT3, VT5. VFO generate on the frequencies twice below the receiving frequency [References 5].

From the mixer audio signal goes to Audio Filter L4, C11, C12 AND THEN TO Audio Amplifier on VT6, VT7. Transformer T3 does matching of impedance of the 32-Ohms headphones with the Audio Amplifier.

**TX mode:** Key S1 is down at TX mode. Switch on VT4 provides DC ground for VT3, VT5. These transistors now are working like doubler/amplifier. RF for the 80-meter band goes to the antenna WA1 through low-pass filter L2, L3, C3, C6, C8, C9. The filter should be tuned with a real antenna to match output impedance of the amplifier with the antenna. **Figure 2** shows PCB of the FETter. VFO was made on the another board.

Coils L2, L3 may be wound on a form not less the 6-mm in diameter. Numbers of turn depend on used antenna. As coil L1 should be used any stable- made inductor, for example, coiled on a ceramic form from an old military radio. Transformers T2 and T3 coiled by trifilar twisted wire, 8 turns. It was used insulated wire from a computer network cable. Core for T2 and T3 is ferrite ring permeability 1000 with OD- 20, ID- 10 and H- 5-mm.

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Transformer T3 is from an old transistor radio. The transceiver should be powered from a battery to avoid hum.

**Tuning:** Audio Amplifier is adjusted by R7 to 1/2 of the supply voltage on the collector of VT7. VFO is tuned to the frequency half of the working one. Pick to Pick RF voltage across the ground and the gate of VT3 (VT5) should be 4... 5- V. Filter L2, L3, C3, C6, C8, C9 is tuned (by its L and C) to the maximum of RF across the real antenna (or across the dummy load). **Figure 3** shows output RF from the transceiver at TX- mode across a dummy load 50- Ohm. Vrms there is equal to 12.1- V, so, output power is 3.0- Watts. However, at proper tuning the transceiver it is possible to get more RF power from the PA.

The transceiver was tested at MAS- 2010 contest. It was made 3 QSO with other contesters: UU7JF, RW3AI and UA9FAX (distance more the 1,500.0- km).

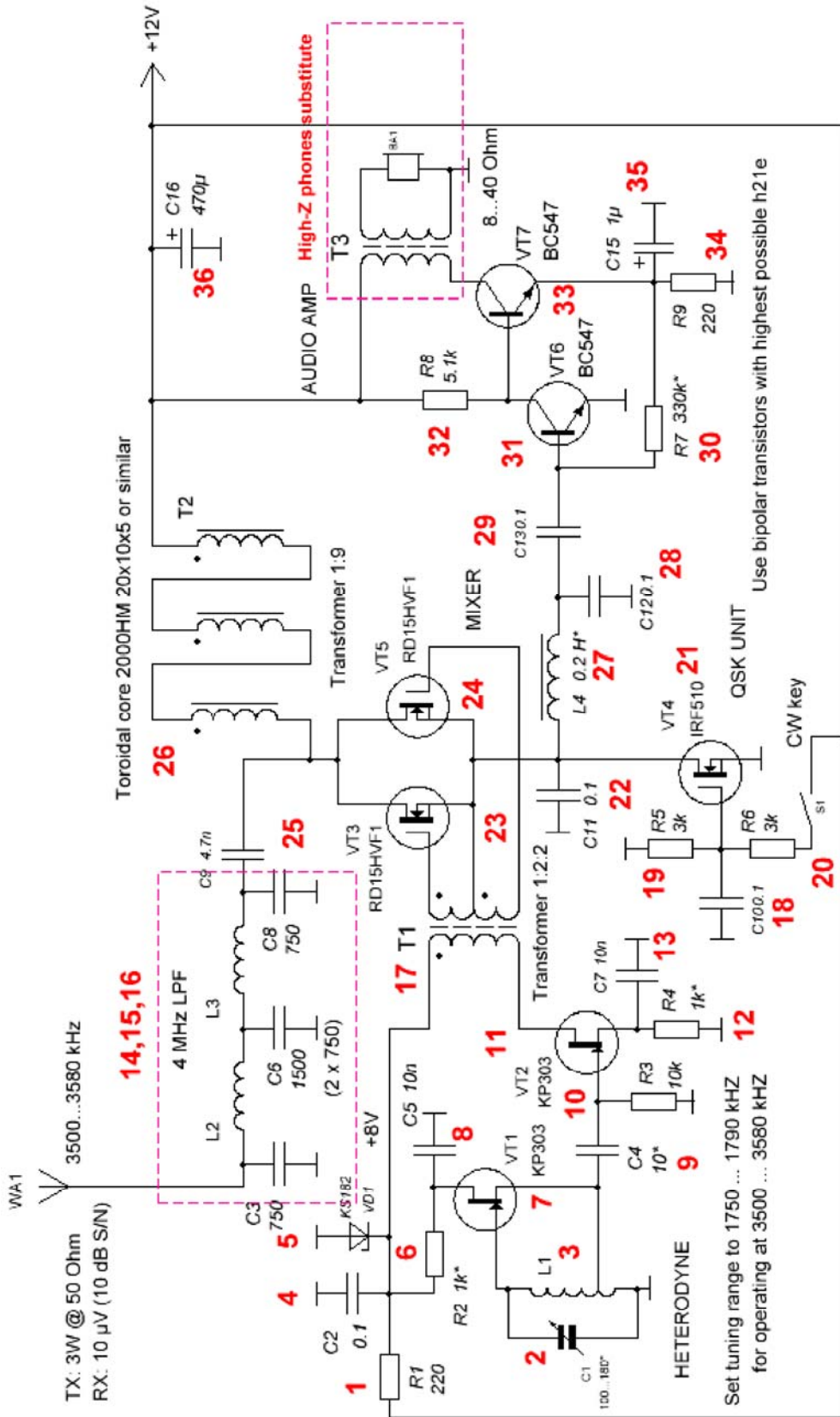


Figure 1 FETter 80

"FETter-80" - DC TRX for Minimal Art Session (MAS QRP contest) by Dmitry UR4MCK 13.05.2010

Original version: "Polevik" by Vladimir T. Polyakov RA3AAE (CQ-QRP #13)

Red numbers: components enumeration according to MAS rules

MAS notes: 4 MHz LPF is counted as 3 components only

MAS notes: instead of using a rare Hi-Z phones, an AF transformer is used with Lo-Z computer phones

MAS category: A36 (homebrew RX & TX with 36 components)

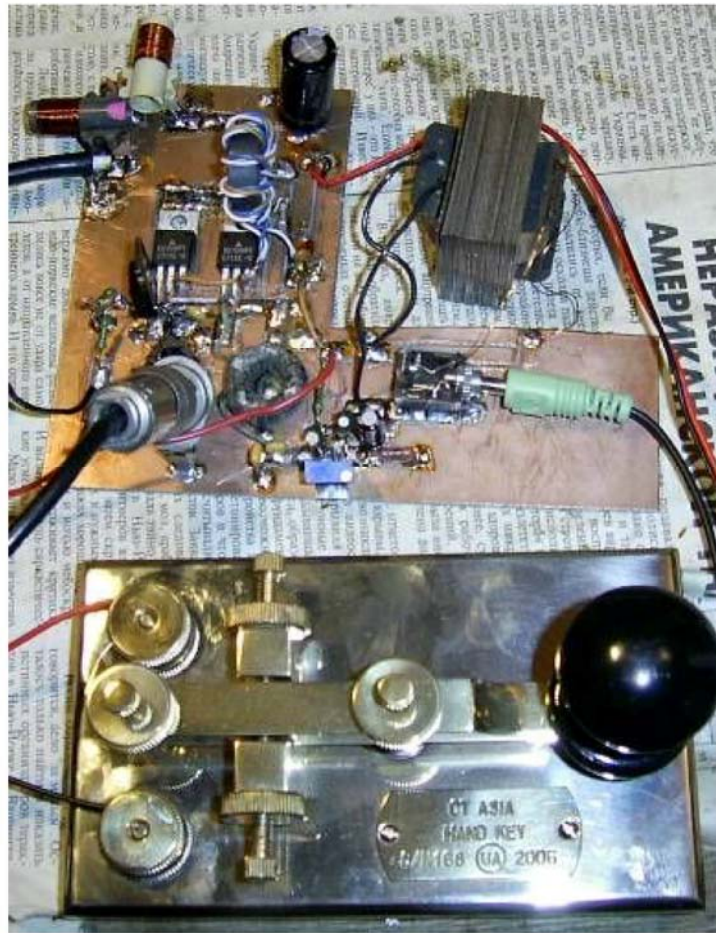


Figure 2 Sample of the FETter (without VFO)

**References:**

1. Transceiver "POLEVIK": By: Vladimir Polaykov, RA3AAE  
[http://www.antentop.org/011/ra3aae\\_011.htm](http://www.antentop.org/011/ra3aae_011.htm)
2. CQ QRP #13,  
<http://qrp.ru/modules/mydownloads/cache/files/cq-qrp/13.pdf>
3. QRP Contest Community, <http://www.qrpcc.de/>

4. QRP MAS, <http://www.qrz.ru/contest/detail/477.html>
5. V. T. Polyakov, "Ham book about Direct Conversation technique"- Moscow, Publishing House "Soviet Patriot", 1990, 264 pages. (in Russian)  
<http://www.cqham.ru/ftp2/RLTPP.djvu>

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Figure 3 Output RF from the transceiver at TX- mode across a dummy load.