# A 13cm zero-IF BPSK transceiver

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A 13cm version of the zero-IF BPSK transceiver was only described in Slovenian language [1]. It is the 13cm version of the very successful 23cm ZIF-BPSK design published in [2]. It is based on the 13cm modules already developed for analog SSB/CW operation [3], [4] and [5], with just small modifications to fit the megabit BPSK operation:
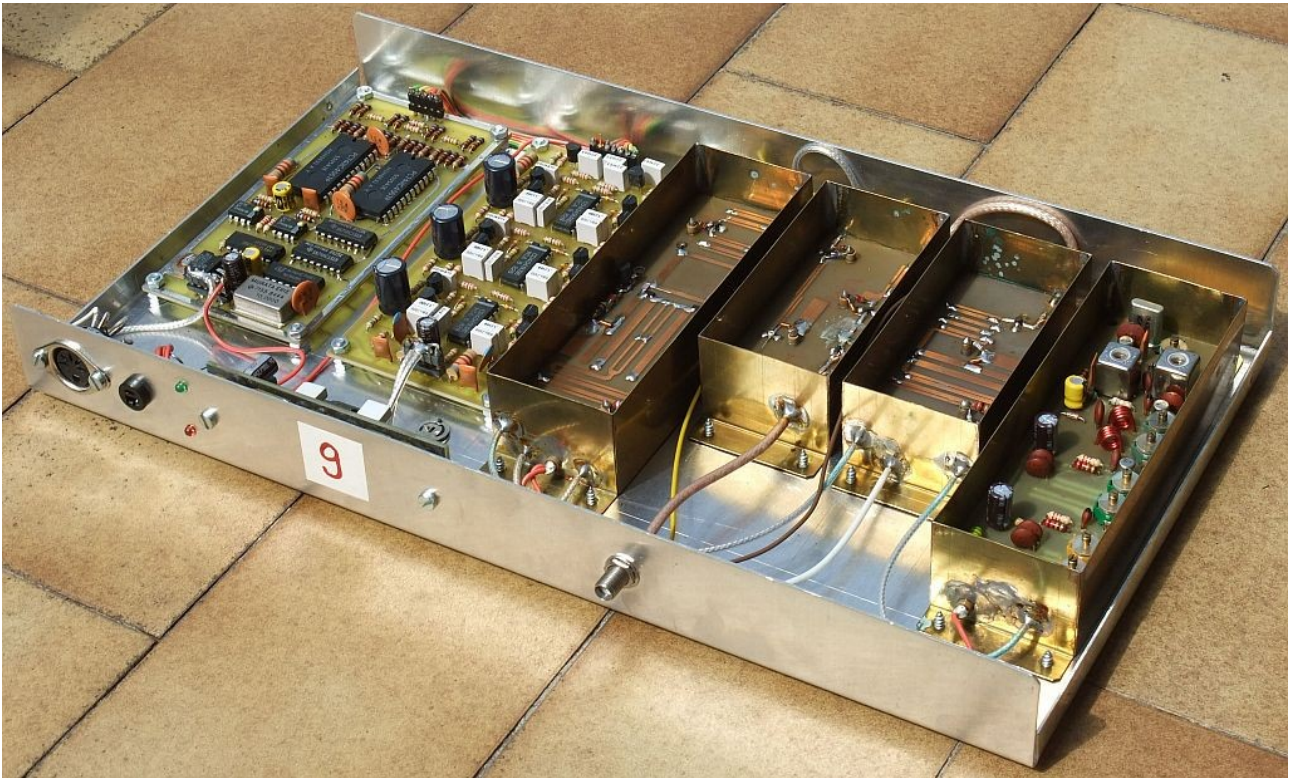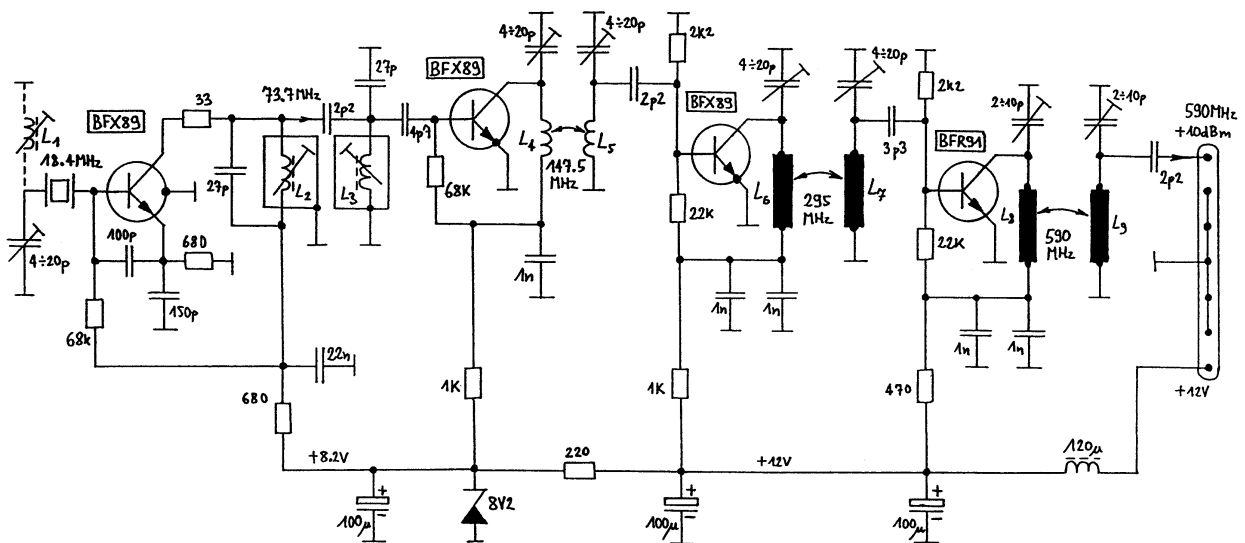

The LO multiplier chain is modified for 590MHz:

Fig.1 - Local oscillator multiplier chain for 590MHz.

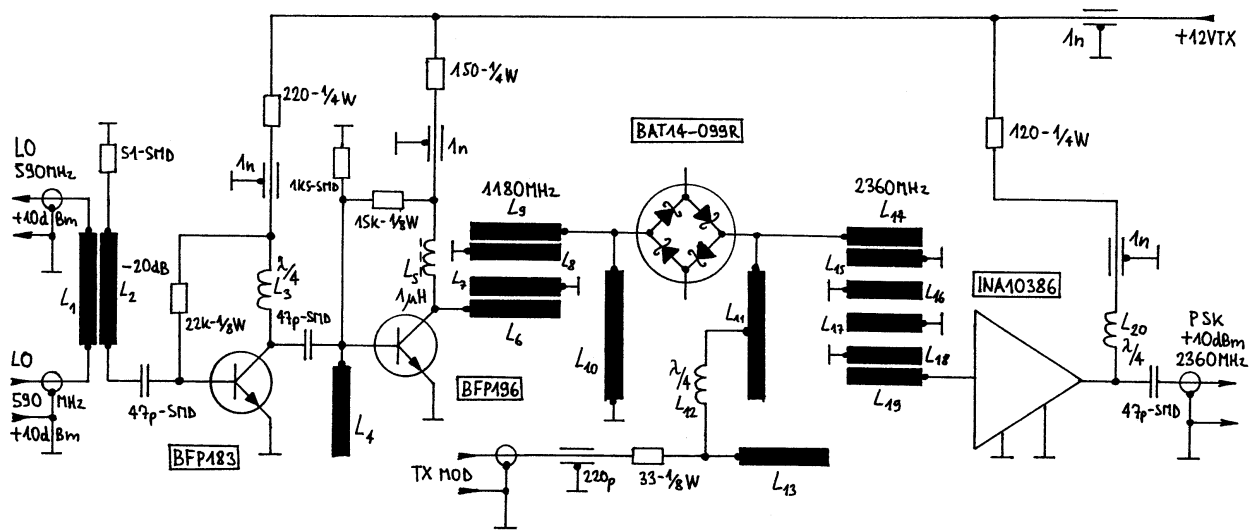The BPSK modulator includes the final multiplier to 1180MHz:

Fig.2 - BPSK modulator for 2360MHz.

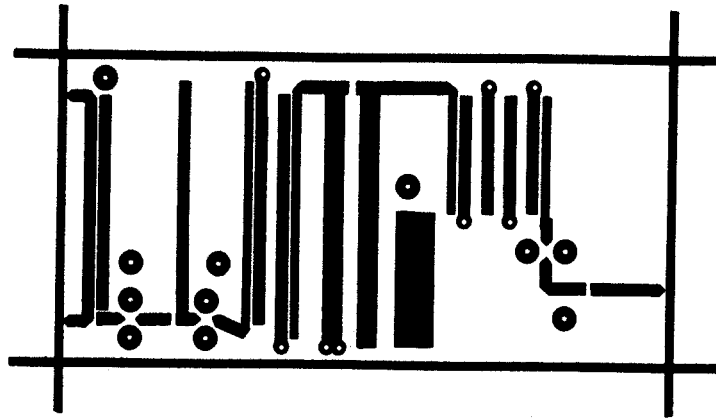The BPSK modulator is built on a 40mmX80mm microstrip board made of 0.8mm thick FR4 laminate:

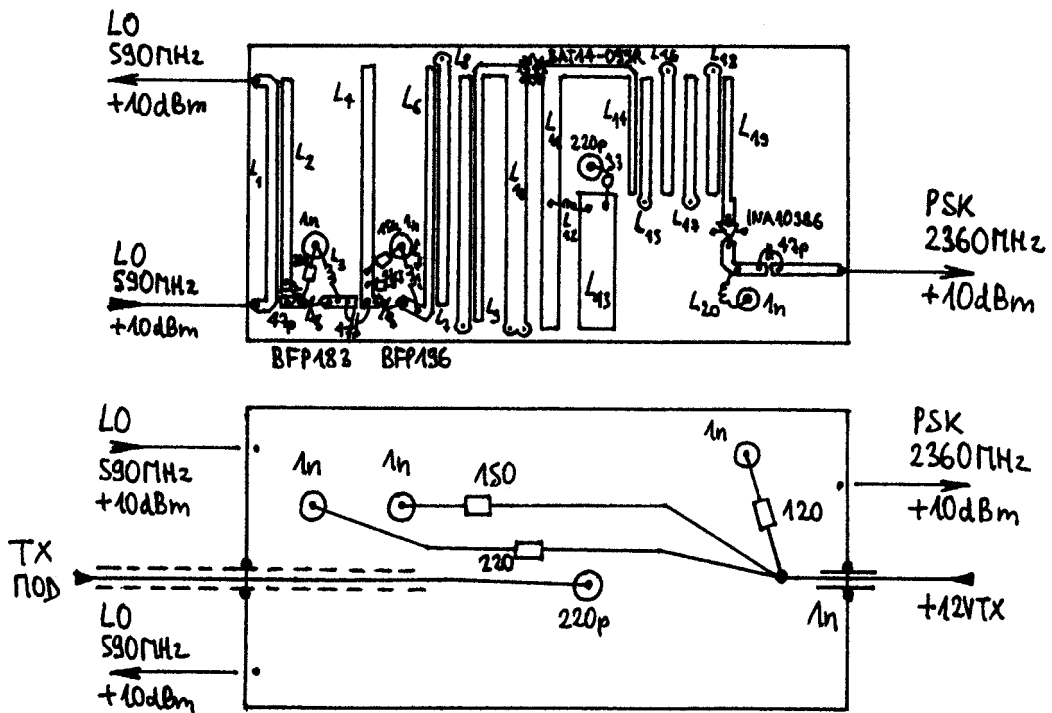**Fig.3 - BPSK modulator PCB (40mmX80mm).**

Fig.4 - BPSK modulator component location.

The RF front end is a just slightly modified version of the SSB/CW front end to allow faster RX/TX switching as required in a high-speed packet-radio data link:
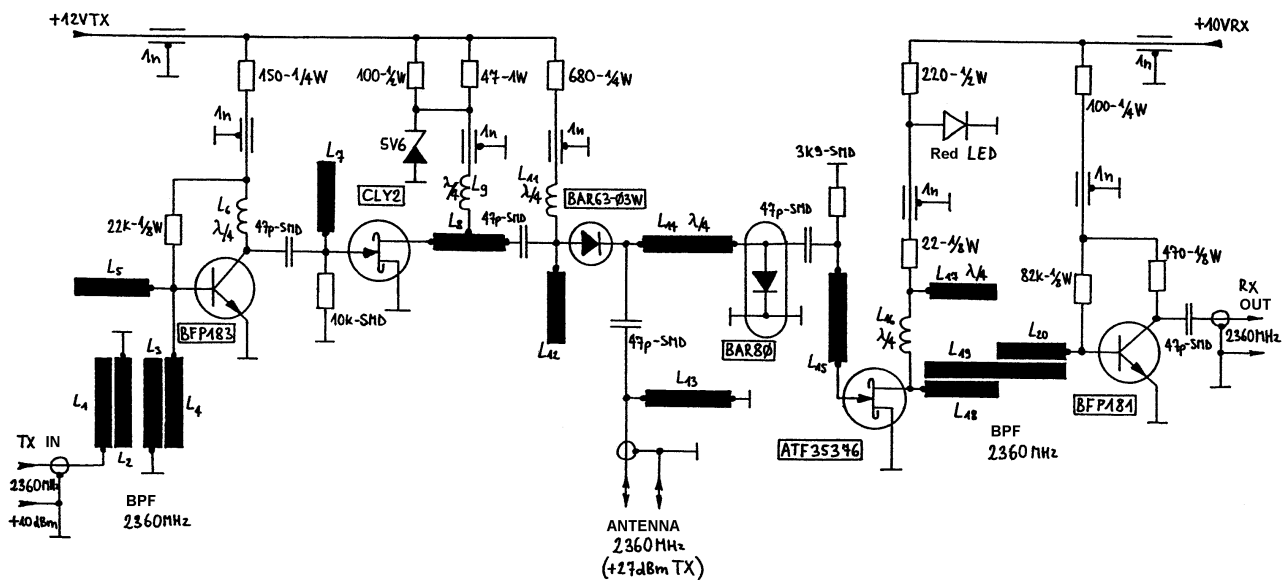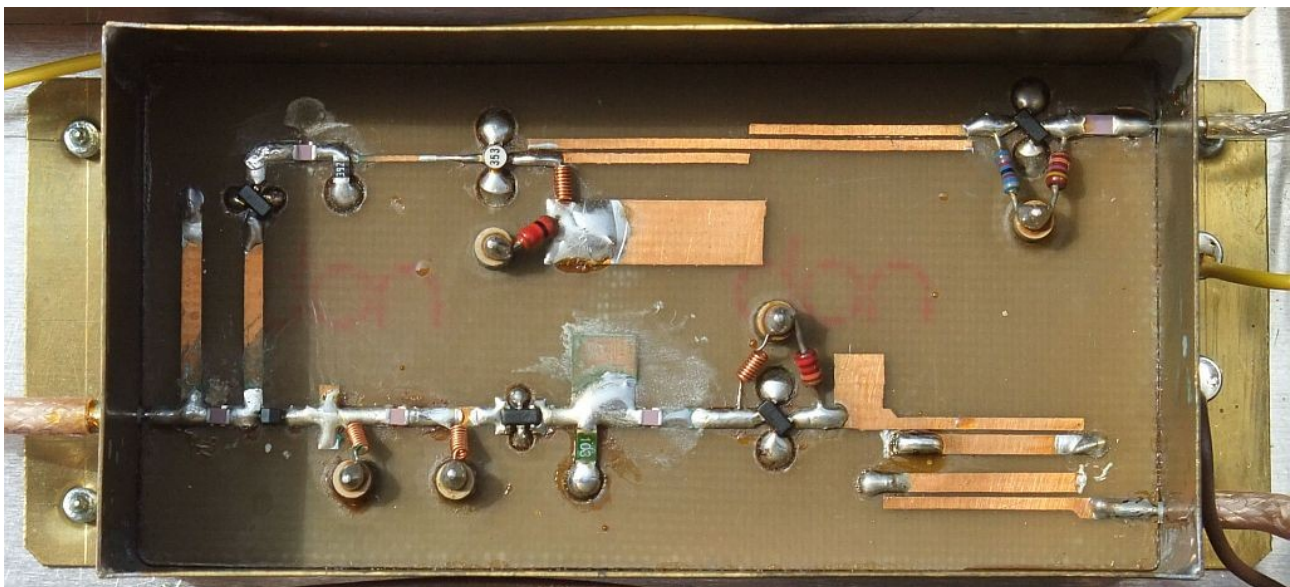
Fig.5 - 13cm RF front-end.

The BPSK front-end PCB is the same as in the SSB/CW version:

The 13cm quadrature receive mixer is also very similar to the SSB/CW version except for some low-frequency filtering components. The BPSK quadrature mixer PCB is the same as in the SSB/CW version:
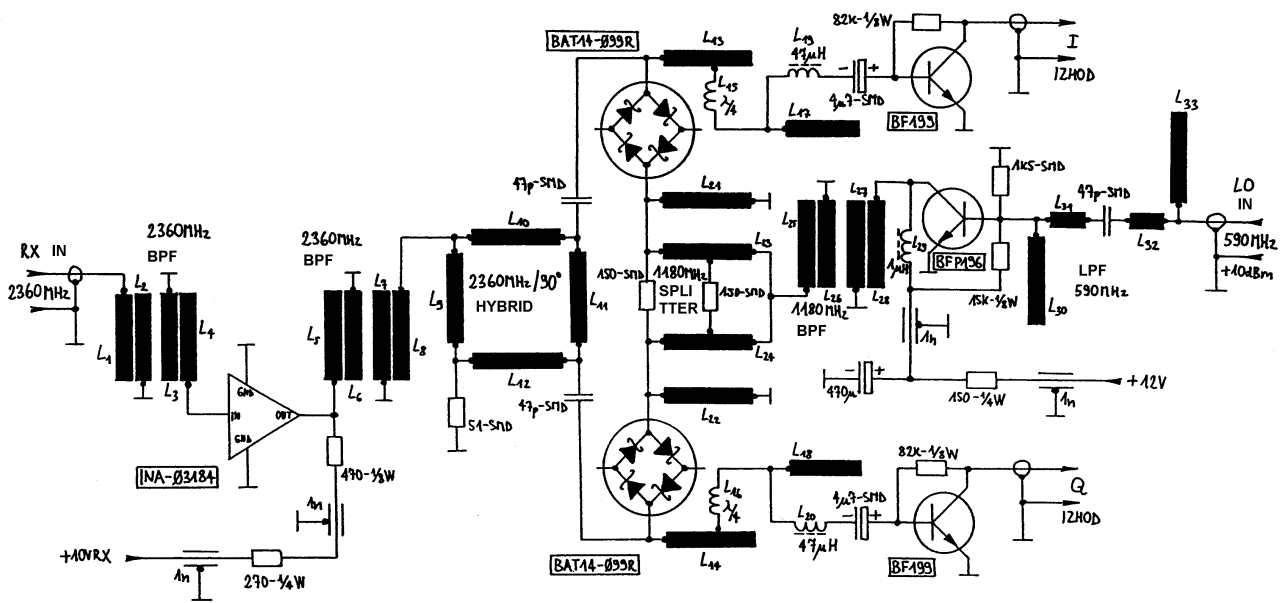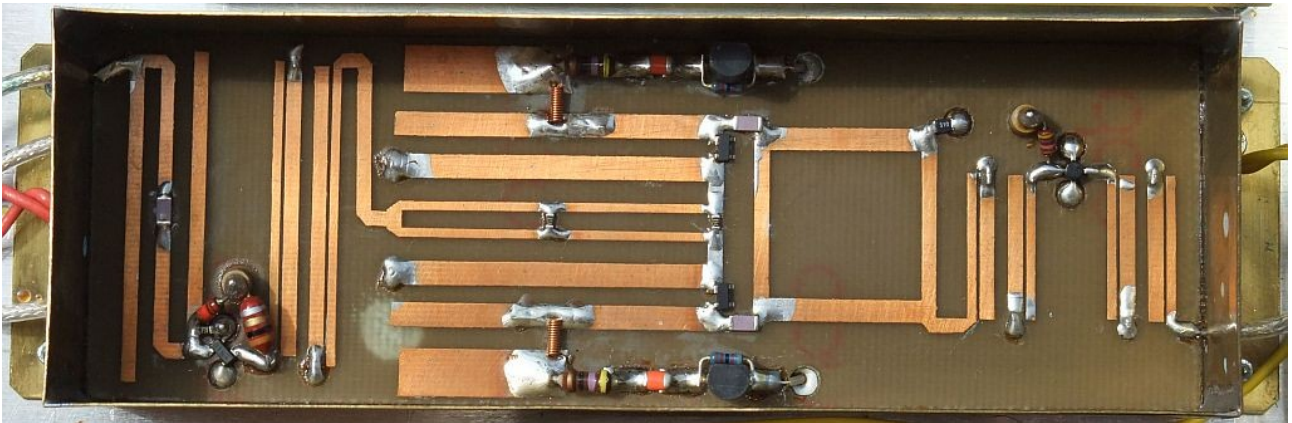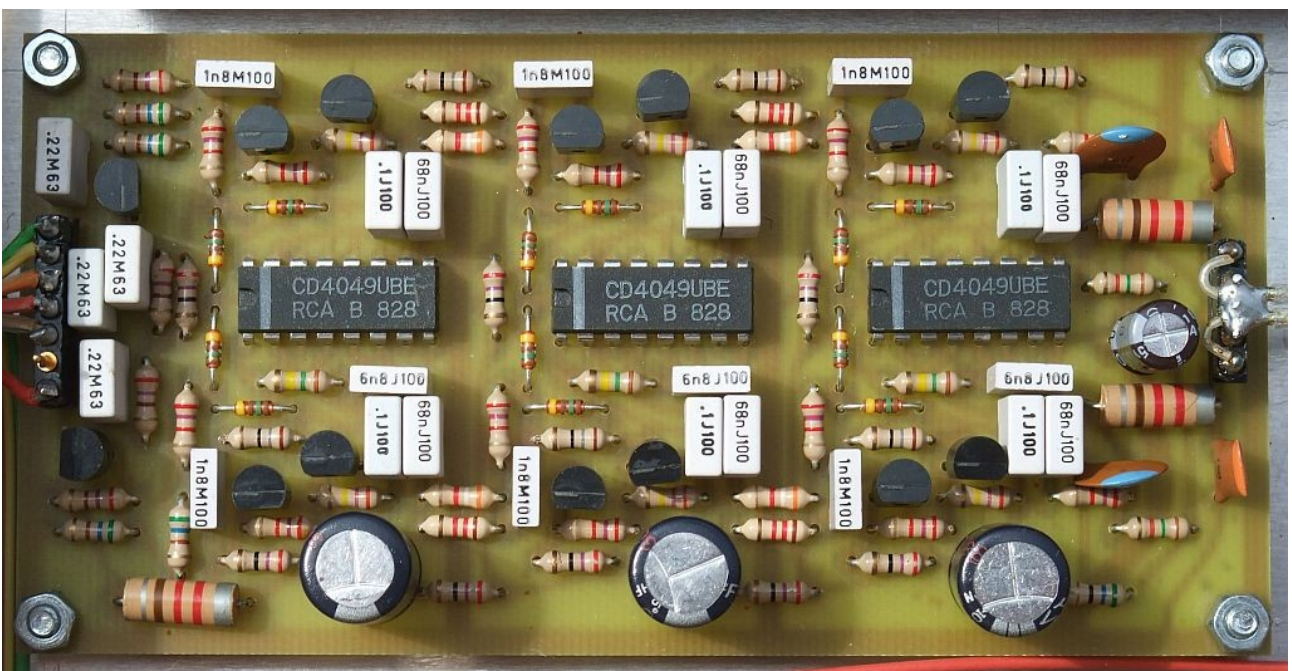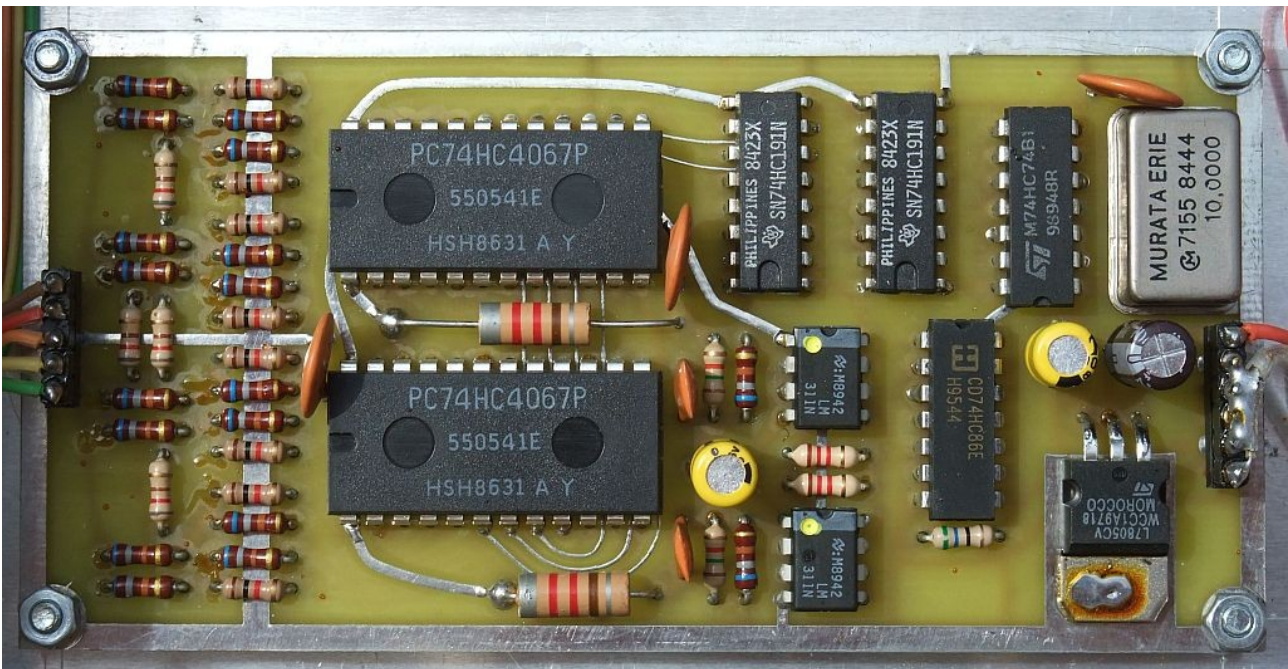
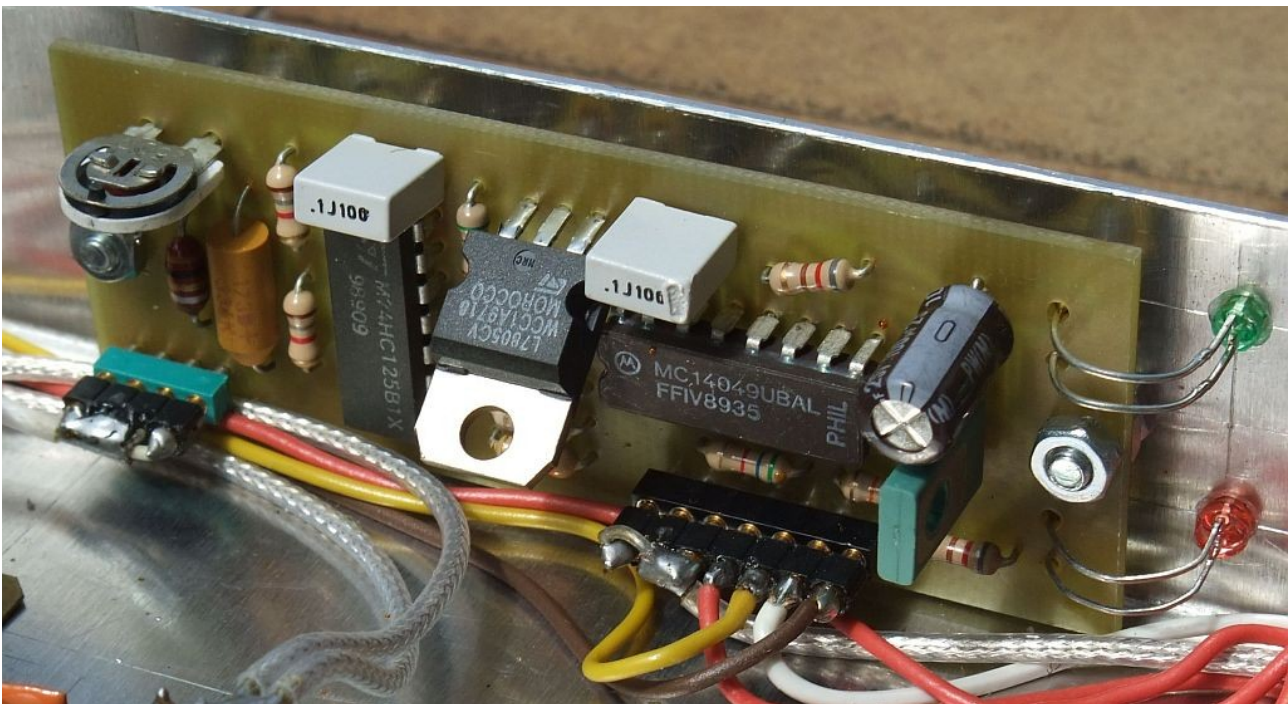**Fig.6 - 13cm quadrature receive mixer.**

The zero-IF chain is identical to the 23cm version:

The Costas-loop demodulator is also identical to the 23cm version:

The supply switch and modulator driver is identical to the 23cm version. Due to the higher load of the 13cm version, the RX supply voltage may drop to just 10V:

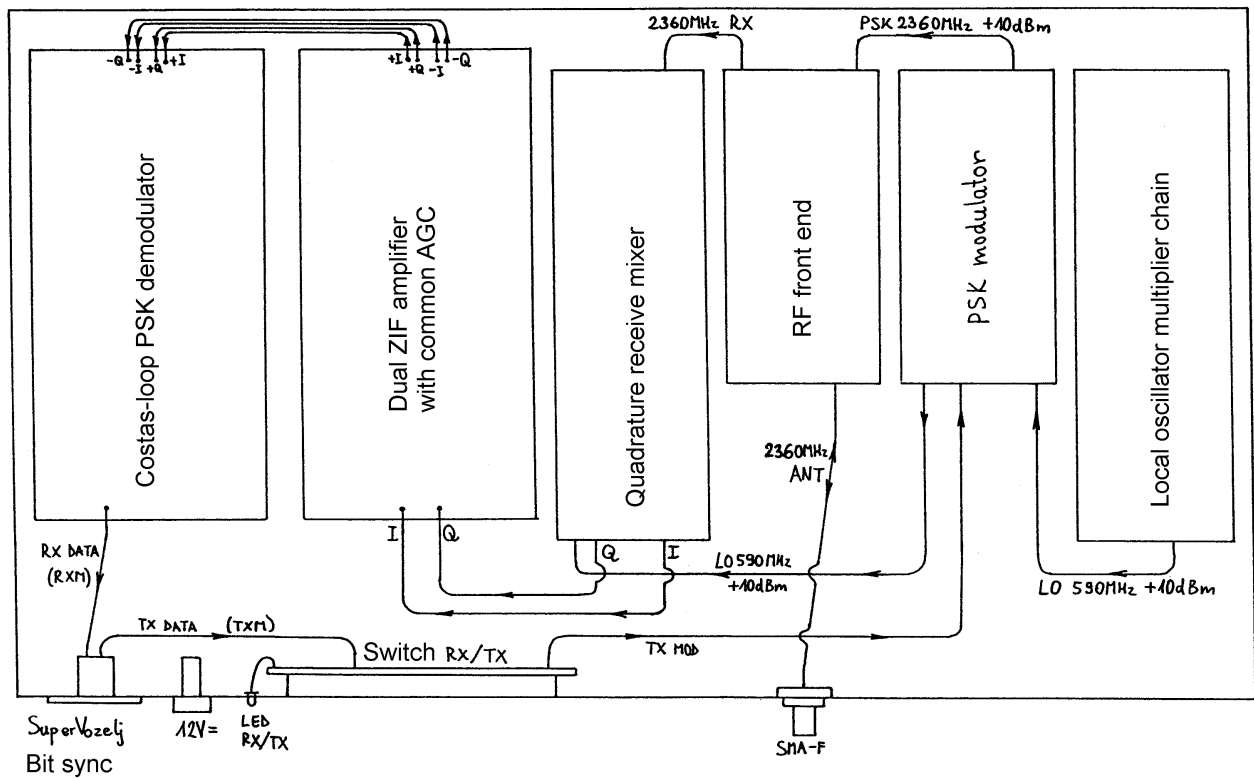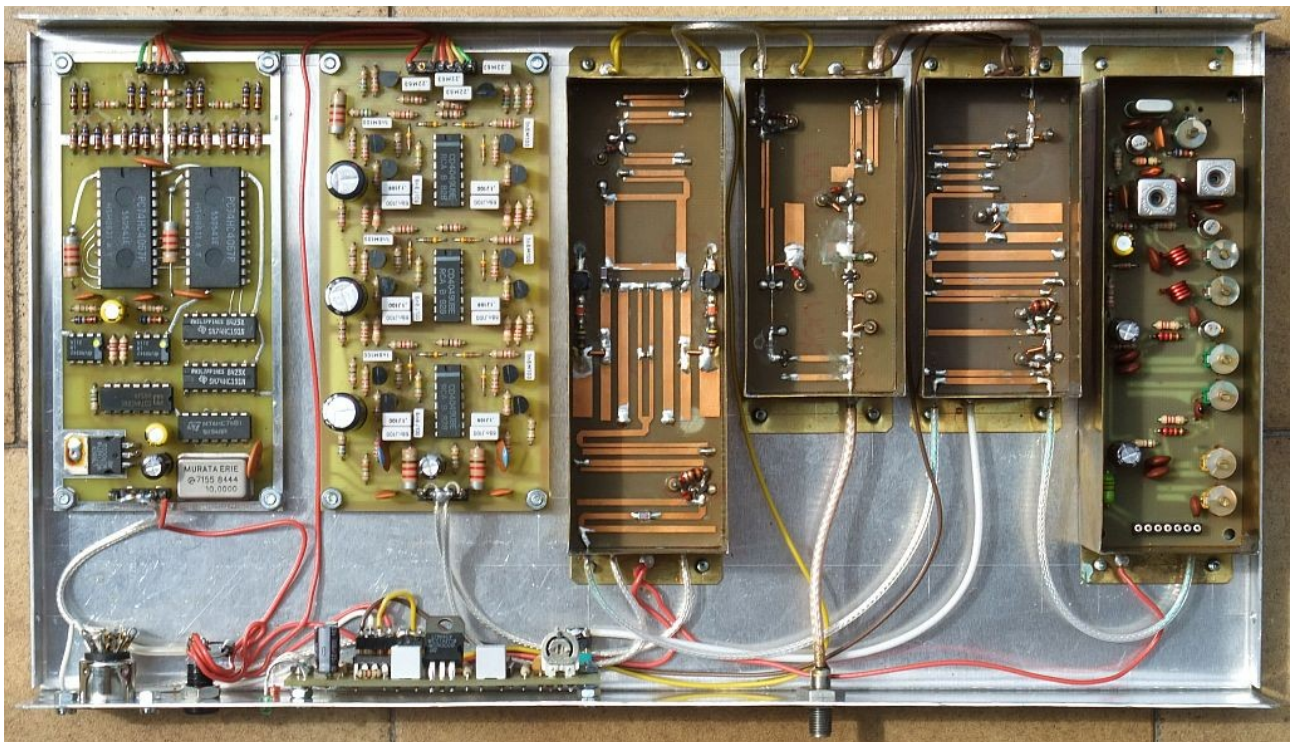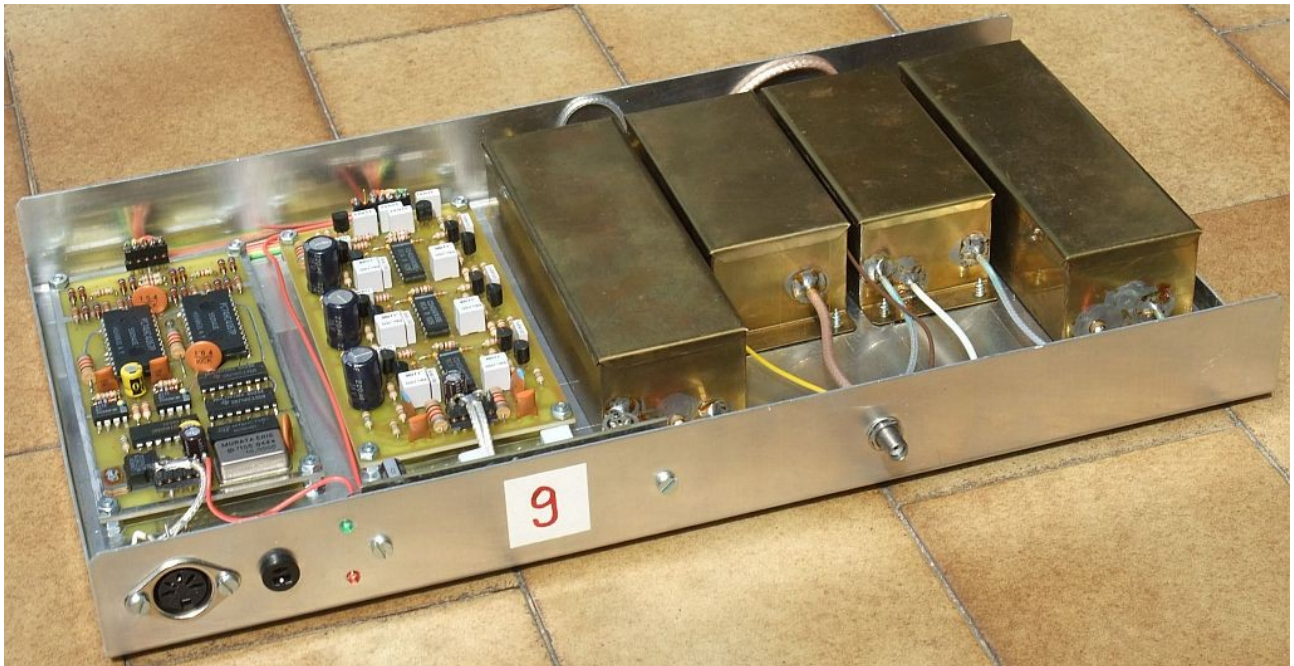The module location is similar to the 23cm version:

Fig.7 - 13cm BPSK RTX module location.

All four RF modules are soldered in brass frames and covered
with brass covers for shielding:

References:

[1] Matjaž Vidmar: "PSK radijska postaja za 13cm z ničelno medfrekvenco", pages 27-31/6-98, CQ ZRS, ISSN 1318-5799.

[2] Matjaž Vidmar: "23cm PSK Packet Radio Transceiver for 1.2Mbit/s User access", pages 74-96/2-97, VHF-Communications, ISSN 0177-7505.

[3] Matjaž Vidmar: "No-Tune SSB Transceivers for 1.3, 2.3, 5.7 and 10GHz (Part I)", pages 5-26/3-97, DUBUS, ISSN Y 502-7128.

[4] Matjaž Vidmar: "No-Tune SSB Transceivers for 1.3, 2.3, 5.7 and 10GHz (Part II)", pages 5-35/4-97, DUBUS, ISSN Y 502-7128.

[5] Matjaž Vidmar: "No-Tune SSB transceiver for 1.3, 2.3, 5.7 and 10GHz (Part III)", pages 5-20/1-98, DUBUS, ISSN Y 502-7128.

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