

10 MHz reference source with automatic switching between OCXO and external reference

Matthias, DD1US, February 6th 2018

Hello,

Recently I bought some old VSAT-equipment and I am presently in the process to make use of the parts for some X-band and KU-band activities.

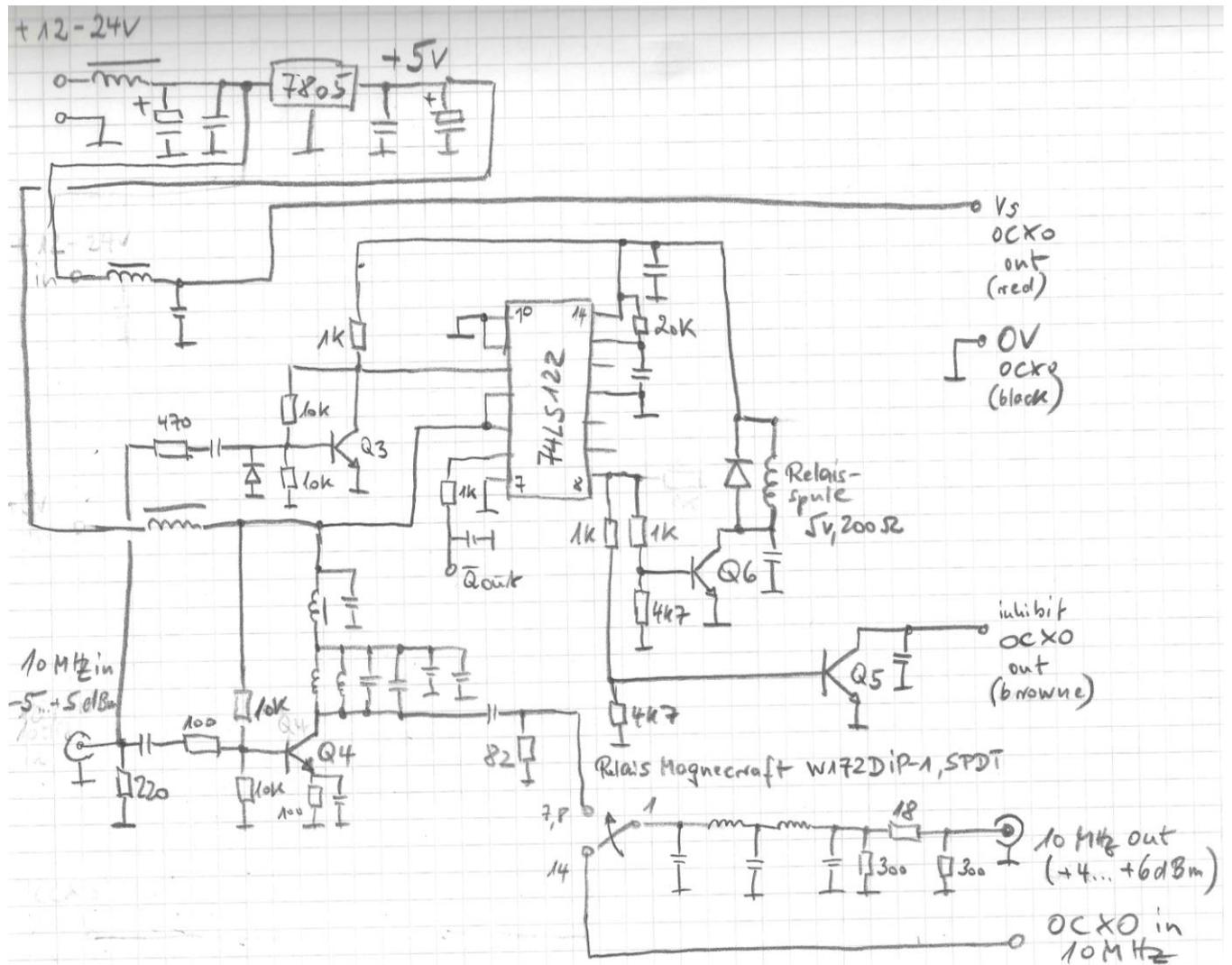
Part of the indoor-unit was a 10 MHz OCXO (oven controlled crystal oscillator). The unit was produced by Piezo Crystal Company from Carlisle, PA, USA. The model number is 2930186. The unit has an SMA-connector which outputs the 10 MHz reference signal. This OCXO was supplying the reference for the PLL synthesizer, which provides the local oscillator signals to the up- and downconverters.

The unit was originally powered by a +23.5V DC voltage. I found out that the supply voltage can be varied between 12V and 24V without any negative impact on the performance of the device. The OCXO also features a TTL compatible input which can be used to switch the clock output on and off. This input shows +5V voltage when left unconnected and the oscillator signal is present at the SMA connector. If the input is pulled low then the clock output is disabled while the OCXO is still heated. The OCXO also feature a tuning screw in the case which I have not used as the output frequency turned out to be very precise and stable.

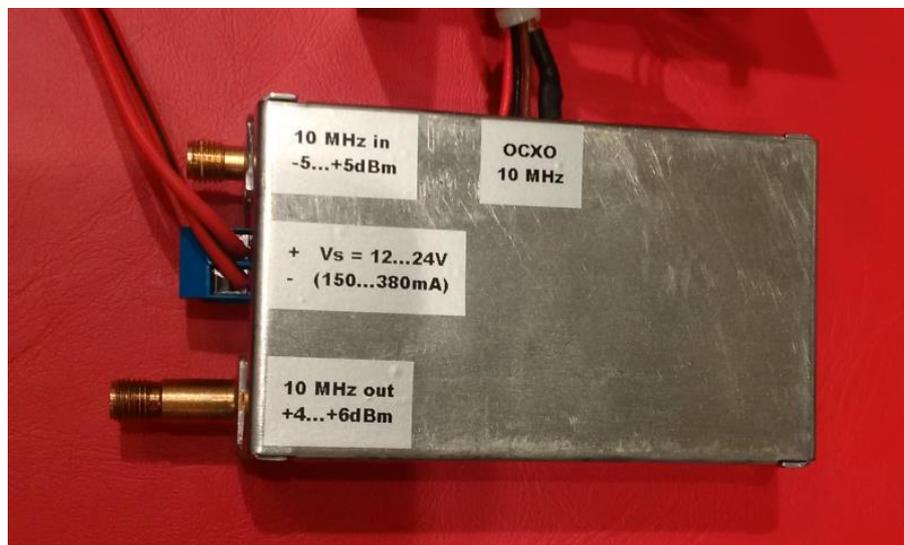
Here is a picture of the OCXO:



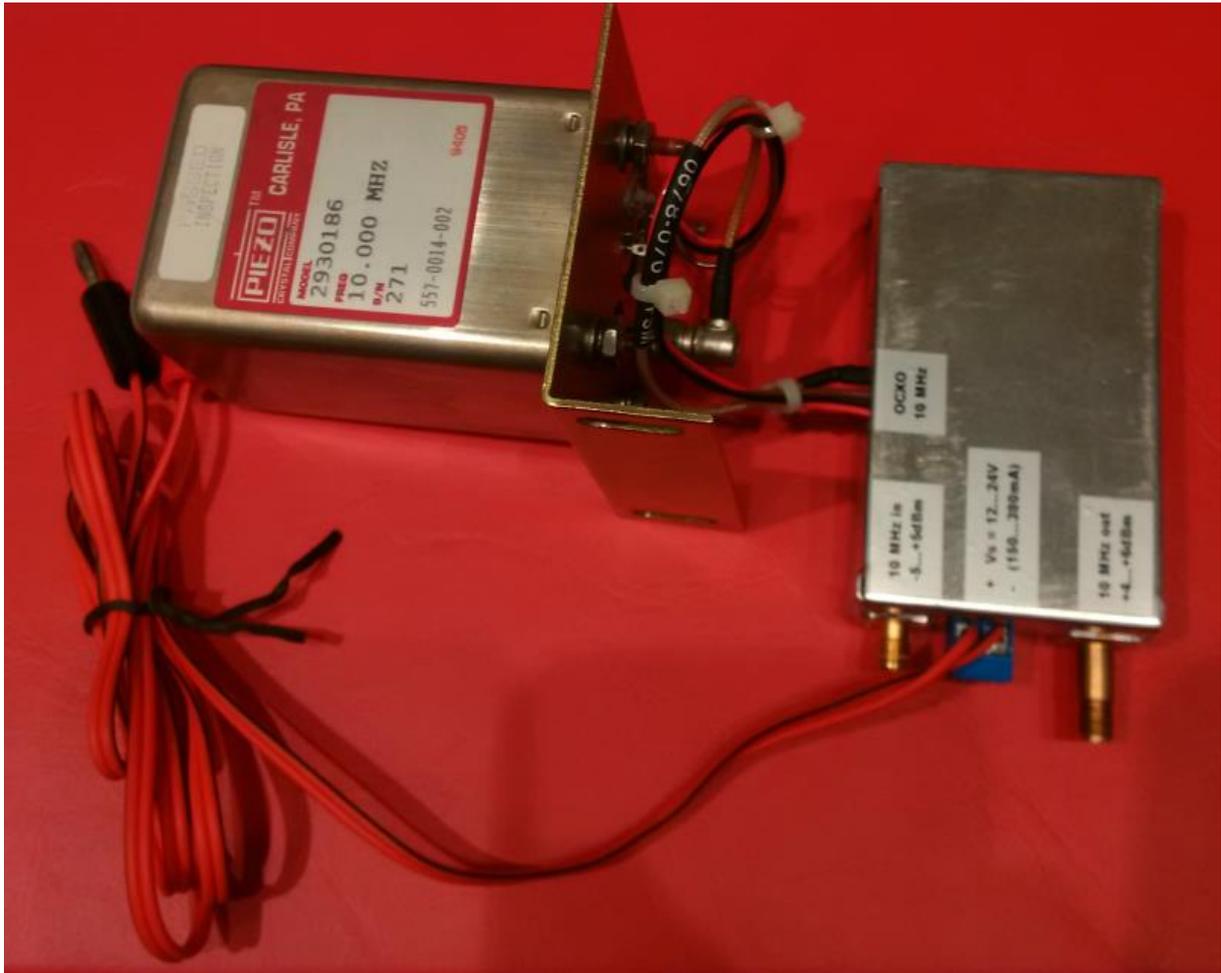
The main PC-board of the indoor unit contained also a circuitry which switched the reference input from the OCXO when an external 10 MHz clock was supplied. I wanted to use this feature also for my setup as I have a GPS disciplined signal source and a rubidium reference which I intend to use especially for very narrowband modes. I cut that part of the PCB off and added a 5V voltage regulator in order to supply the circuitry from the same supply voltage as the OCXO. Here is a sketch of the schematic which I extracted:



I prepared the cut-out PCB and assembled it into a shielded metal case. Here are some pictures of the finished setup:







I always appreciate feedback. Please send it to the Email address below. Many thanks in advance.

Best regards

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