

QO-100 Amsat-DL Downconverter V3

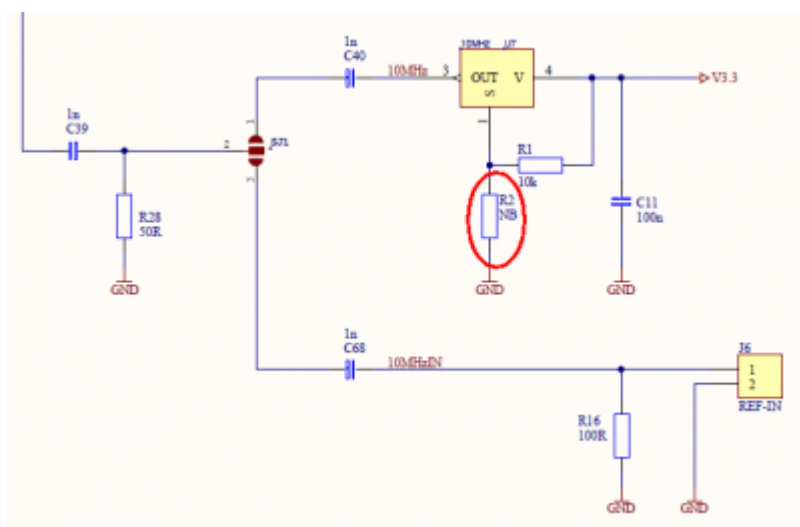
Stefan DG8FAC, Alex DG2MMO, Matthias DD1US

(VC) TXCO modification

In the meantime, many of the QO-100 upconverter kits have been sold by AMSAT-DL and have been successfully put into operation by numerous radio amateurs. Most recently there was a batch of upconverters in which the 40MHz TCXO (temperature compensated crystal oscillator) was replaced by a VCTCXO (voltage controlled temperature compensated crystal oscillator). The connection surface of both oscillators is identical, the connection assignment is slightly different:

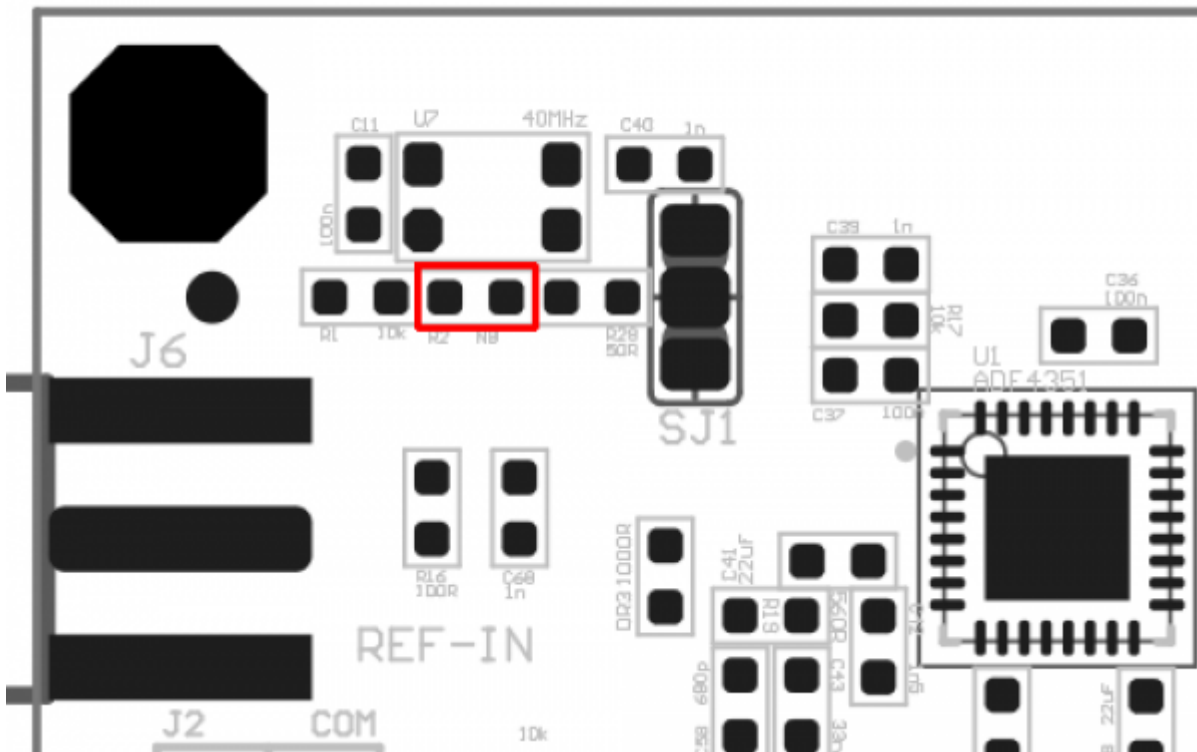
- The TCXO has an enable pin # 1, which is connected to the supply voltage by a pull-up resistor in order to switch on the oscillator.
- With the VCTCXO from TAITIEN model no. TXEACLSANF-40.000000 this connection # 1 is the control input with which the frequency of the oscillator of 40 MHz can be finely adjusted by means of a control voltage.

Unfortunately, when equipping this first batch of the new version V4.3, we forgot to equip an additional SMD resistor R2 in the space provided next to the VCTCXO.



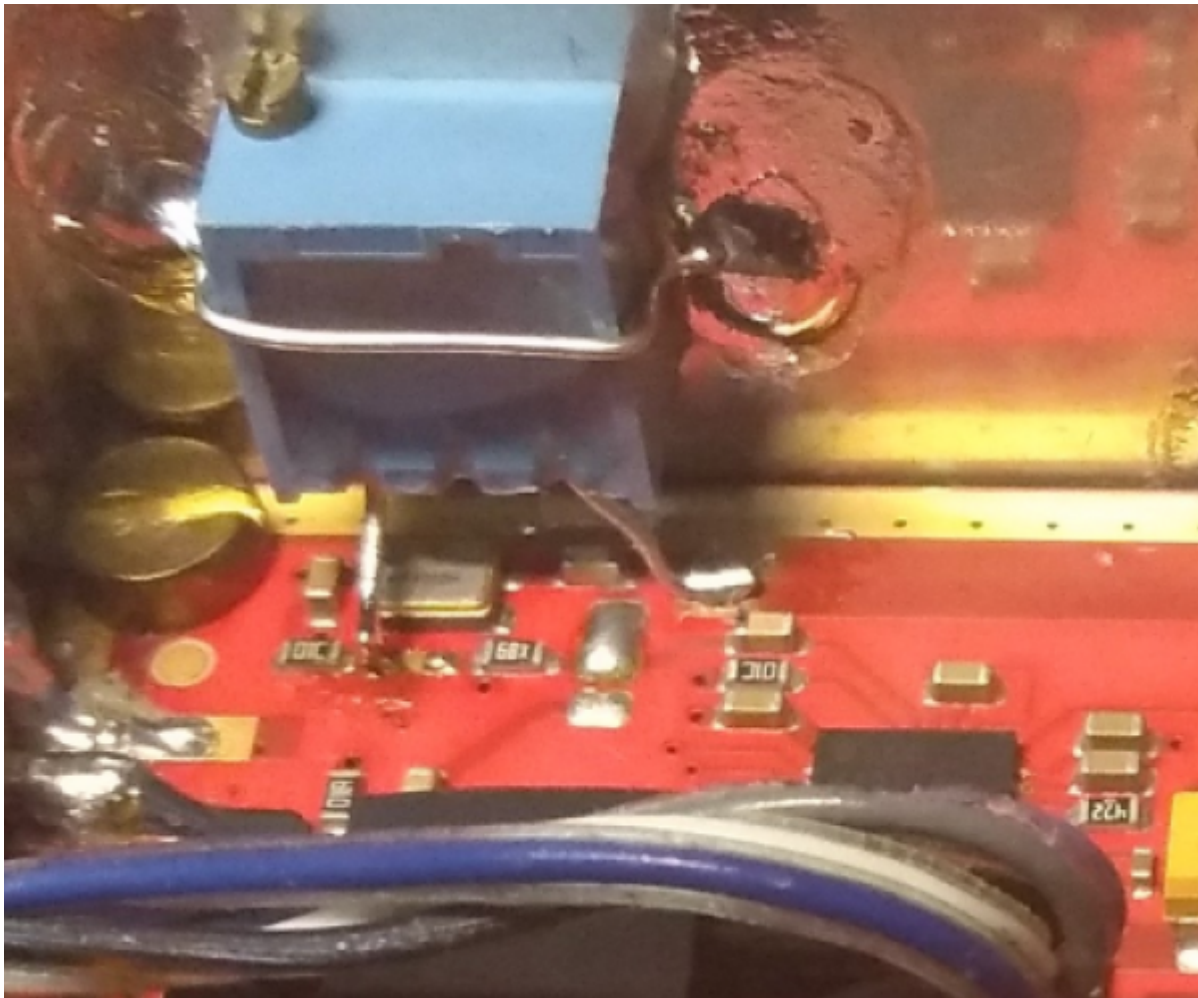
If you have a kit from this batch, you now have 2 options:

- He equips the missing SMD resistor $R2 = 8.2k\Omega$, which then forms a voltage divider with the equipped resistor R1 and sets the VCTCXO to approximately the specified frequency. In the next picture the place for this resistor R2 is marked in red.



- If you want to be even more precise, you can install a 10kOhm 10-speed spindle trimmer from pin # 1 of the VCTCXO to ground instead of the 8.2kOhm resistor. For this you can use the left pad of R2 in the picture above. He can then set the frequency precisely at room temperature and only a small temperature drift remains.

Here is a picture of the conversion with a 10kOhm 10-speed spindle trimmer, which Alex DG2MMO kindly provided.



The center tap and the right connection of the 10-speed spindle trimmer are soldered to the ground on the edge of the board. The spindle trimmer itself is fixed to the tinplate housing by means of a wire clip. Depending on the assembly of the tinplate housing in the overall structure, it can make sense to use a thin copper wire to connect the circuit board to the connector used on the spindle trimmer. This creates a flexible connection and thus decouples the small soldering pad on the circuit board from mechanical stress on the tinplate housing.

Attention: The changes described above are only necessary if the upconverter is not fed with an external reference signal. Most AMSAT-DL upconverters are operated together with the AMSAT-DL downconverter, i.e. the reference frequency generated in the downconverter is fed into the upconverter and thus the TCXO or VCTCXO described is not used anyway!

Of course, the SMD resistor R2 will be fitted in all future batches in which a VCTCXO is used.

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