

Upgrade your standard Hameg HM8123 with an OCXO time base.

Hameg offered this only as an ex. factory option, but it's quite easy to change the TCXO for an OCXO.

There are at least two ways to change the TCXO in an OCXO:

- Use the original board and remove some components and add a couple of new ones, or
- Use an *original* replica of the Hameg oscillator board (PCB only) with two extra resistors (optional) and a through-hole pin header where you only have to add only the components needed.

Open your instrument:

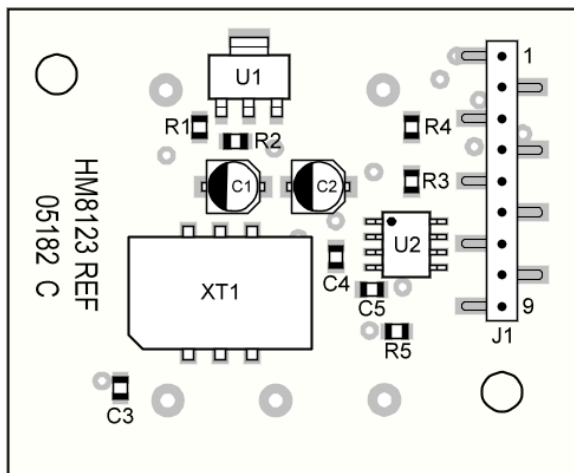
- Remove one screw on the bottom side just behind the plastic front panel.
- Remove the 6 screws at the back panel.
- Remove the back panel.
- Slide the instrument out of its housing.

The oscillator board is mounted with two screws to the main board. Be careful not to lose the two washers when removing the screws!

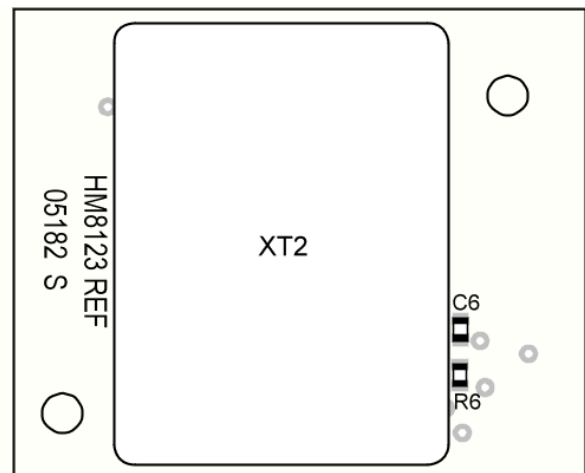
The oscillator board can now be removed. Careful, in earlier versions pin 9 of the connector was soldered to the board.

If you want to use your own TCXO board, follow the next steps:

- Remove XT1 (10MHz TCXO).
- Remove R5 (0 Ω).
- Mount C6 (100nF X7R 50V 0805).
- Mount R6 (332 Ω 0805).
- Mount XT2 (Morion MV103).



Component side



Soldering side

Resistor R5 (0 Ω) is only present in case of a TCXO and pulls an input of the μ P low. In case of an OCXO the input needs to be high, so the μ P will recognize the presence of the OCXO.

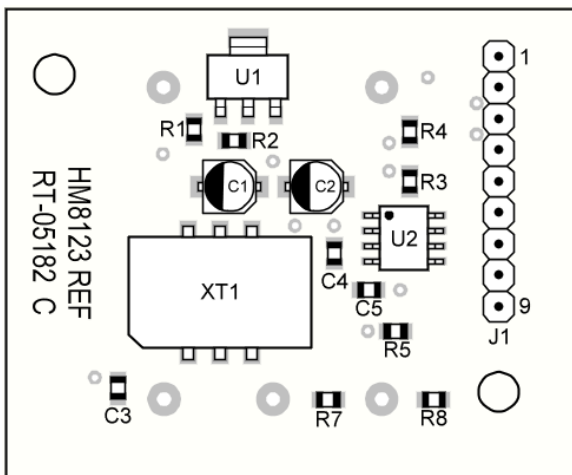
No further hardware or software adaptations are needed.

Now you can insert the oscillator board with OCXO, mount it with the two original screws with washers and close the instrument.

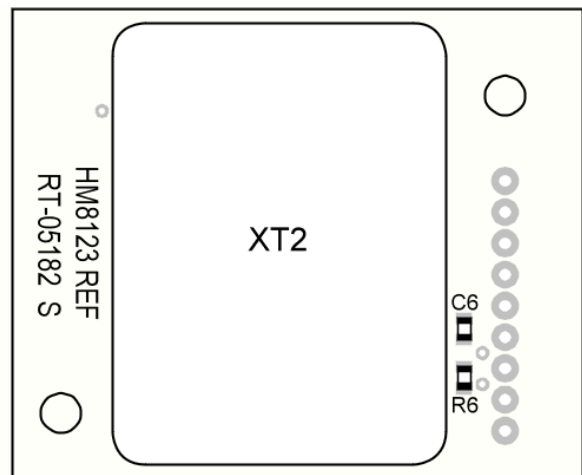
Calibration is necessary, see the instructions on the last page accordingly.

If you have a new PCB, follow the next steps:

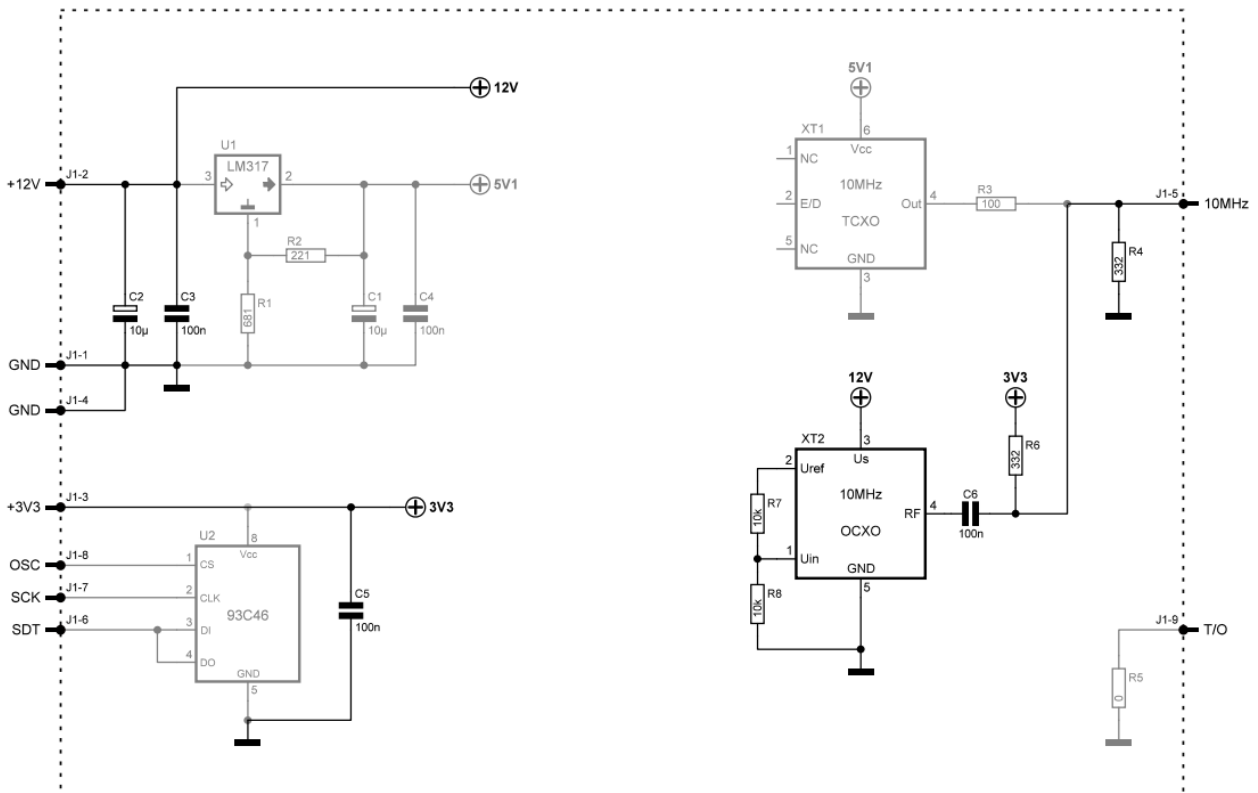
- Mount C2 (10 μ F 16V 105°C B).
- Mount C3 (100nF X7R 50V 0805).
- Mount C5 (100nF X7R 50V 0805).
- Mount C6 (100nF X7R 50V 0805).
- Mount R4 (332 Ω 0805).
- Mount R6 (332 Ω 0805).
- Mount R7 (10k Ω 0805), this one is optional.
- Mount R8 (10k Ω 0805), this one is optional.
- Mount J1 (9-pins male header). Remark: In later versions J1 was replaced by a female version.
- Mount XT2 (Morion MV103).



Component side



Soldering side



Parts list.

Item	Description	Manufacturer	Man. part number
C1	Omitted		
C2	10µF 16V 105°C	Panasonic	EEE-FP1C100AR
C3	100nF 50V X7R 0805	Yageo	CC0805KRX7R9BB104
C4	Omitted		
C5	100nF 50V X7R 0805	Yageo	CC0805KRX7R9BB104
C6	100nF 50V X7R 0805	Yageo	CC0805KRX7R9BB104
J1 *	Pin header 2.54mm	Connfly	DS1021-1X9SF1-32-B
J1 *	Female header 2.54mm	Harwin	M20-7820942
**	Spacer stud 13mm M3	Würth Elektronik	970130321 (2 pcs.)
PCB	HM8123 REF	RT	RT-05182
R1	Omitted		
R2	Omitted		
R3	Omitted		
R4	332Ω 0805	Yageo	RT0805FRE07332RL
R5	Omitted		
R6	332Ω 0805	Yageo	RT0805FRE07332RL
R7	10kΩ 0805	Yageo	RT0805FRE0710KL
R8	10kΩ 0805	Yageo	RT0805FRE0710KL
U1	Omitted		
U2	Omitted		
XT1	Omitted		
XT2	10MHz OCXO 12V Sine	Morion US	MV103a XO00396M

* Earlier versions will have a male pin header, later versions a female header.

** In case J1 is a female version, the length of the two existing 12mm spacer studs has to be increased by 1mm e.g. by adding 2 or 3 M3 washers per stud, or they can be replaced by a 13mm version.

Now you can insert the oscillator board with OCXO, mount it with the two original screws with washers and close the instrument.

Calibration is necessary, see the instructions on the next page accordingly.

- Disclaimer:** Modifying your HM8123 is of course at your own risk.

RT, 15-04-2024