

26.09.2023

ME14-X & ME28-X IF RX/TX Xtal Filter



1. Introduction:

ME14-X and **ME28-X** type IF crystal filters can be utilised to any type transverter furnished with 14MHz or 28 MHz IF output.

The equipment comprises 12pcs Xtal filters tuned for the CW and SSB band sections in accordance with the IARU band allocation. The frequency range is 14.030-14.400 MHz, 28.030-28.400 MHz respectively. The filters prevent the strong signals of nearby stations entering into the HF radio, furthermore significantly decreases the disturbance of the running and searching station occurring in the receiver located at the same QTH (HF inband operation, 50 – 300m).

On VHF & UHF transverter mode we can use the filter in the IF TX line also, to kill the unwanted side noise, CW click of the driving transceivers.

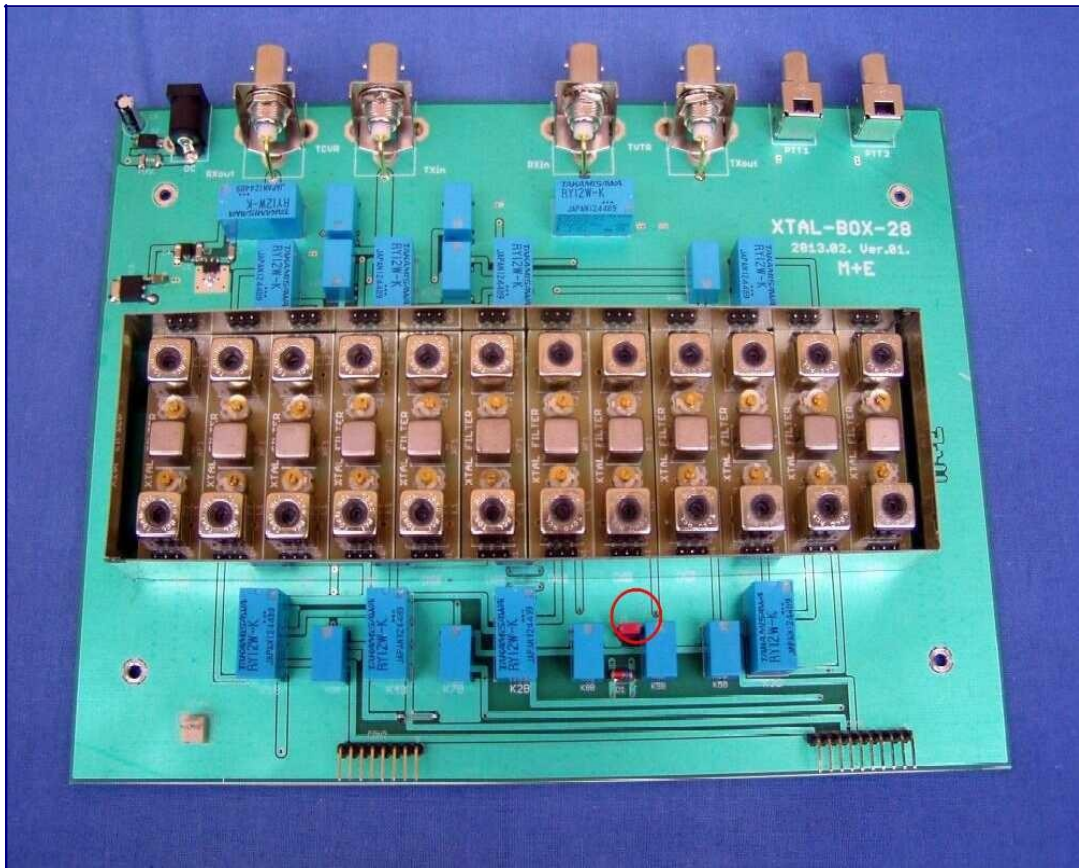
2. Description:

14 MHz and 28 MHz versions of the filter equipment (**ME14-X**, **ME28-X**) available. The filter consists of 12 pcs Xtal filter units. The CW filters available in +/- 5 KHz/3 dB or +/- 7,5 KHz/3 dB CW, while the SSB filters in +/- 12,5 KHz/3 dB, or +/-15 KHz/3 dB bandwidth versions.

You can select the passband centre frequencies enlisted below:

CH	ME28-X CH Fo	ME14-X CH Fo	BW
1	28.040MHz	14.040MHz	+/-7.5KHz/3dB,+/-25KHz/40dB*
2	28.055MHz	14.055MHz	+/-7.5KHz/3dB,+/-25KHz/40dB
3	28.070MHz	14.070MHz	+/-7.5KHz/3dB,+/-25KHz/40dB
4	28.085MHz	14.085MHz	+/-7.5KHz/3dB,+/-25KHz/40dB
5	28.100MHz	14.100MHz	+/-7.5KHz/3dB,+/-25KHz/40dB
6	28.115MHz	14.115MHz	+/-7.5KHz/3dB,+/-25KHz/40dB
7	28.170MHz	14.170MHz	+/-15KHz/3dB, +/-40KHz/40dB*
8	28.200MHz	14.200MHz	+/-15KHz/3dB, +/-40KHz/40dB
9	28.230MHz	14.230MHz	+/-15KHz/3dB, +/-40KHz/40dB
10	28.260MHz	14.260MHz	+/-15KHz/3dB, +/-40KHz/40dB
11	28.290MHz	14.290MHz	+/-15KHz/3dB, +/-40KHz/40dB
12	28.320MHz	14.320MHz	+/-15KHz/3dB, +/-40KHz/40dB
13	28.350MHz	14.350MHz	+/-15KHz/3dB, +/-40KHz/40dB
14	28.380MHz	14.380MHz	+/-15KHz/3dB, +/-40KHz/40dB

Prior to turning the equipment on you need to select 1 or 2 cable IF mode by means of setting J1 jumper mounted on the main board. Setting “ON” selects separate RX and TX cable, while “OFF” selects common RX/TX cable mode. (In case of request the equipment is shipped suitable factory setting.)



Connect the filter accordingly to your transverter and base HF radio.



The equipment shall be supplied from a +12...15V /0,3A stabilised PS. (Option). The centre pin of the DC connector is for positive supply voltage.

During TX PTT1 and PTT2 connector pins have to be grounded. You can connect here two separate base radio's SND (SEND) outputs. (I.e. the running to PTT1, and the searching station to PTT2) Connection [1xIF cable](#) and [2x IF cable](#)

3. Operation:

Turn the equipment on pressing the "ON" knob. As a result, you can read the message displayed as follows:



The equipment switches to the first channel (CH1) after a few seconds delay.



Select the desired passband centre frequency turning the CHANNEL knob.

Pressing the knob "PRE" turns an IF preamplifier stage ON/OFF (It's based on a GALI-41 type high dynamics MMIC.)

Pressing the knob "ATT" turns a 10 dB attenuator stage ON/OFF.

You can use both PRE and ATT in the same time. In this case the total gain of the 2 stages is 5- 6 dB (i.e. 1 S grade) Pushing the "CHANNEL" knob turns the actually selected passband filter OFF, thus the filter equipment switches into "BYPASS" mode. Both PRE and ATT function settings remain active in BYPASS mode.



Pressing CHANNEL knob again reactivates the formerly selected passband filter. Transmission (grounding any of the PTT inputs) turns both PRE and ATT off. The main (runing) radio IF transmit signal going across the selected filter, (e.g. CQ channel) except when we are on *BYPASS* mode. The 2nd radio (S/P) station IF TX signal going directly to the transverter.

- no filter in the line. **The max IF TX level of radios is allowed max. +5dBm! Higher TX level can kill the Xtal filters!**

You can use both type filters easy in [2x radio mode](#) on your contest station

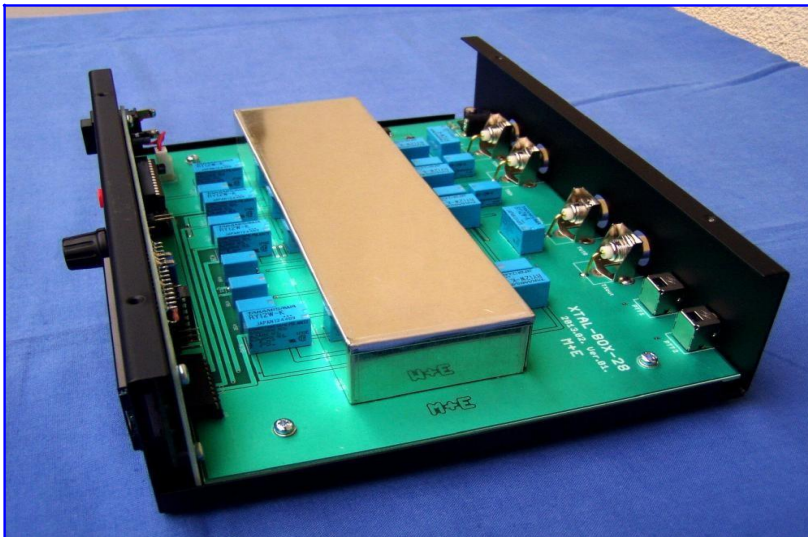


4. Construction:

The filter is accommodated in a 240x190x60mm size ALU box. That is, the equipment's basic "floor" area complies with that of the transverters we manufacture.

Chassis:

The in/output connectors, the box of the filters containing maximum 12 pcs. of Xtals filter units, the IF preamplifier, attenuator, and the switching relays are mounted on the chassis.



The CW and SSB filters are of plug-in configuration. The filters can be plugged in in any sequence. The filter position and associated passband centre frequency can be programmed in PRG mode, together with the number of built-in filters. The user later may extend the equipment adding the optional filters ordered, and can program the displaying accordingly.

The filter units are high slope rate 4-pole filters, and the L-C components have been tuned for 50 Ohm in/output impedance. All of the filter units are factory tuned; both the insertion loss and the impedance are optimised for 50 Ohm.

The latest version uses filters with 50 ohm input and 50 ohm output impedance, so the PCB appearance is different from the previous version.

Control panel:

The programmable controller (PIC), the 5V DC stabiliser and the FETs controlling relays are mounted on the control panel together with the front panel's control knobs. The display is a 2 lines, 16 characters per line LCD unit connected to the controller via an I²C bus.



Specification:

RX:

Insertion loss:	<2.0dB on CW, <2.5dB on SSB
Filters ripple:	<1dB
IF amp. gain:	typ. 13dB
RX attenuator:	-10dB
P1dB:	> +13dBm
RX att. on neighbour RX ch:	min. 30dB
RX attenuation on other RX ch:	min 40dB

TX:

Max. IF input TX PWR:	+5dBm
Insertion loss:	Max. 2.0 dB
TX sign. ripple:	<1dB
TX att. on neighbour TX ch:	min. 30dB
TX attenuation on other TX ch:	min. 40dB
PTT1 inp:	GND on TX, main TCVR
PTT2 inp:	GND on TX 2nd TCVR (S/P stn.)

General:

Power supply:	External, +12...15V/0.3A
Dimensions:	240 (W)x 60 (H)x 190 (D) mm
Weight:	1.0kg

Program mode:

The filter equipments we ship to the users factory programmed and tuned for the required frequencies. On condition that you order additional filter units, you can modify the program entering the number of channels and the new passband centre frequencies using the program mode. However we are shipping additional optional filter units exclusively for registered filter customers.