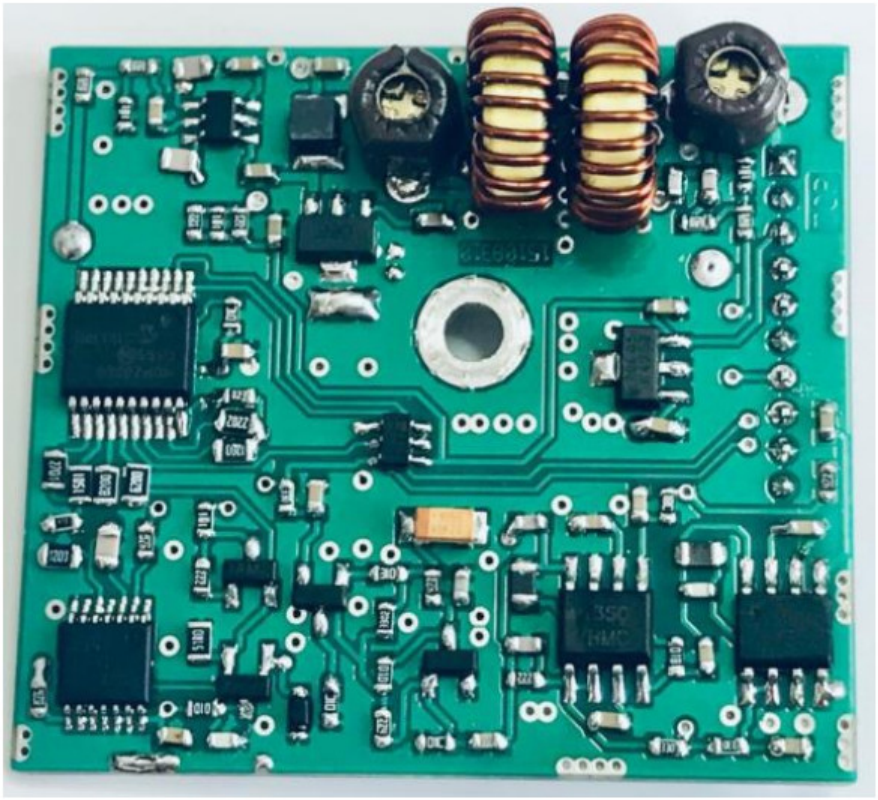

# RGO ONE Noise Blanker HF Transceiver User Manual



# RGO ONE

**Noise blanker(NB) option**
**Operating/installation manual**



**RGO ONE HF transceiver NB oponal board manual revision 1.01A**

Contents



## Introduction

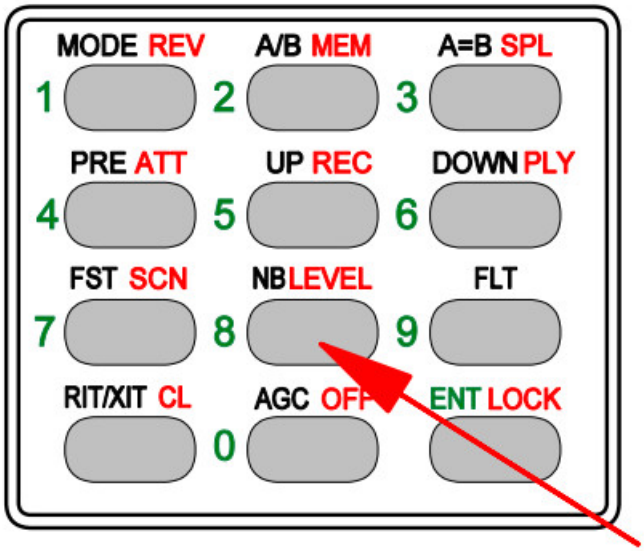
RGO ONE is classic super heterodyne analog conversion SSB/CW amateur transceiver with 9MHz single intermediate frequency. Optional noise receiver/ noise blanker (NB) unit is placed right after post RX mixer amplifier U12 on RF MIXER board. NB module detects short incoming pulses and produces blanking pulse which neutralize disturbing interference signal early in the receive path just before first 9MHz (roofing) filter. Unlike all modern transceiver's technology where digital DSP technology is in use – in RGO ONE all the signals are analog processed avoiding signal distortion and improving signal dynamic range.
It is known that performance will be most effective when noise pulses are short in duration and comparatively long in period. Characteristic types are those produced by automotive ignitions, home appliances, small DC motors, pulse noises from power lines and other man made devices. Noise with short periods and longer duration such as QRN, are less discernible by the circuits and consequently more difficult to eliminate. Optional NB board works on RX and its location is on RF MIXER board in your RGO ONE.

## Specifications:

| | |
|---|---|
| Pulse bandwidth Threshold/sensitivity | 7 ÷ 70 µSec |
| NB insertion loss/gain | 10µV ÷ 220µV |
| Input frequency | +1.5db (±1db) |
| IF bandwidth | IF 9MHz |
| Noise gate type | 130kHz |
| Noise gate isolation | PHEMPT Ga-As SPDT switch |

## Noise blanker operation

2.1. Switch noise blanker on or off by short press of NB button located on front panel keyboard. Corresponding NB icon on LCD appears/disappears on LCD. Long press of NB button enters in menu 36 – Threshold/sensitivity selection 1-16.

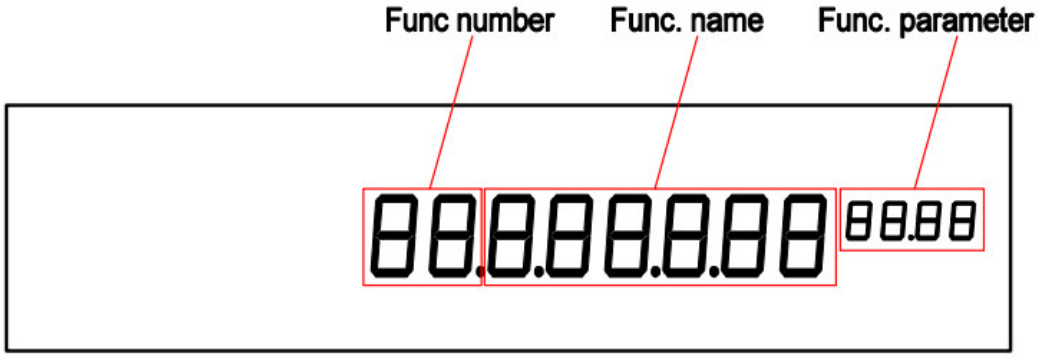



2.2. Menu controls. Noise blanker action is user adjustable in: menu 35 nbp – noise gate pulse width. Parameter can be selected

| parameter | gate pulse width, µSec |
|---|---|
| 1 | 7 µsec |
| 2 | 8 µsec |
| 3 | 9 µsec |
| 4 | 11 µsec |
| 5 | 20 µsec |
| 6 | 28 µsec |
| 7 | 36 µsec |
| 8 | 72 µsec |

menu 36 thr – noise blanker threshold/sensitivity level – 16 selectable values from 1 to 16. NB action is most sensible when parameter is set to 16

LONG press of MTR MNU button enters the configuration menu LONG press of MTR MNU button stores parameters changed and leaves the menu




Short press of RIT/XIT CL button dicards the changes made and leaves the menu

FUNCTION selection is controlled by encoder 3

PARAMETER selection is controlled by encoder 4

35 Noise Blanker pulse width and OFF


Always off when NB module is not installed

36 Noise Blanker Threshold level adjustment

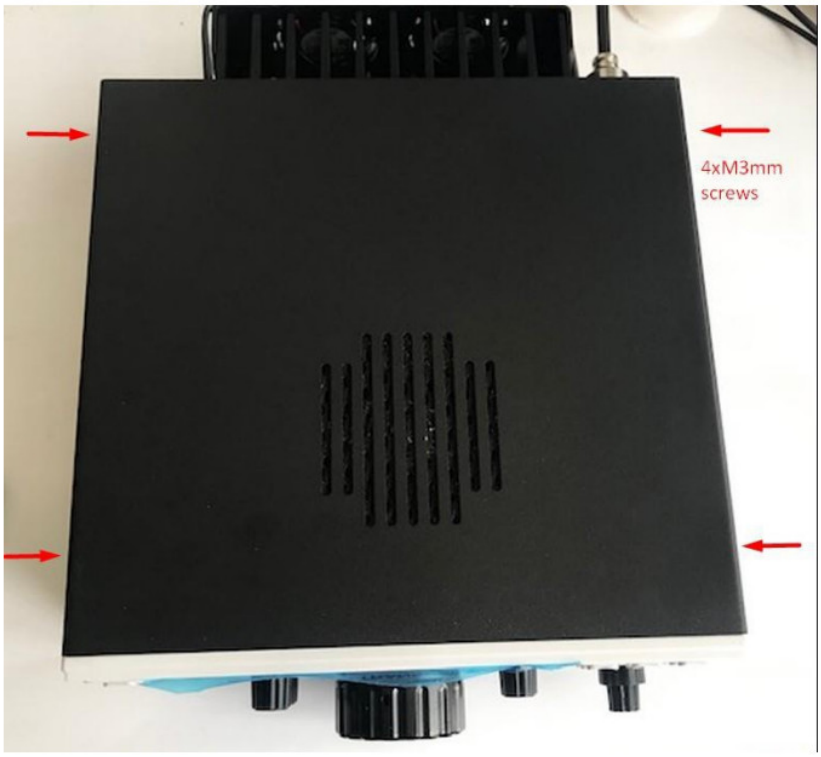

When nbP=8 (widest blanking pulse) and threshold/sensitivity level is set to value bigger than 10 – this might be very aggressive adjustment and incoming signal could become distorted and unintelligible. In this case NB icon on LCD starts blinking fast.

**Note:** Menu 35 and 36 are only accessible when NB optional board is fitted onto its place in RF MIXER board. If NB optional board is not installed menu 35 and 36 are inactive and their respective parameters show "—-". Front panel NB button will be inactive too and trying to use it will produce low pitched beep. (If beep function of the radio is enabled).

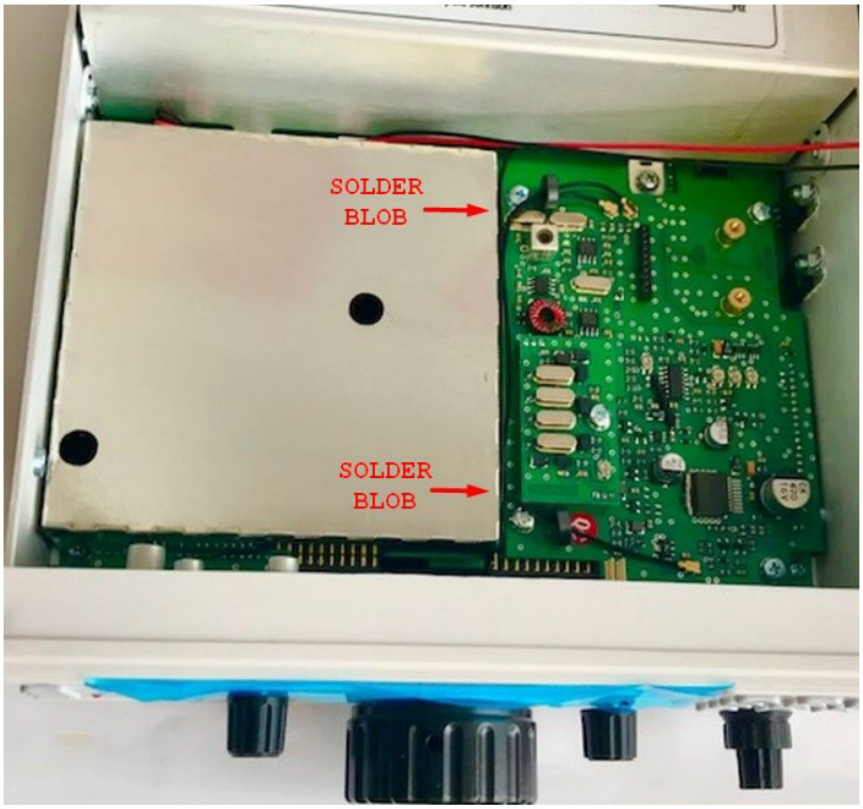
## Module installation

**Please switch off power supply and disconnect power cord.**

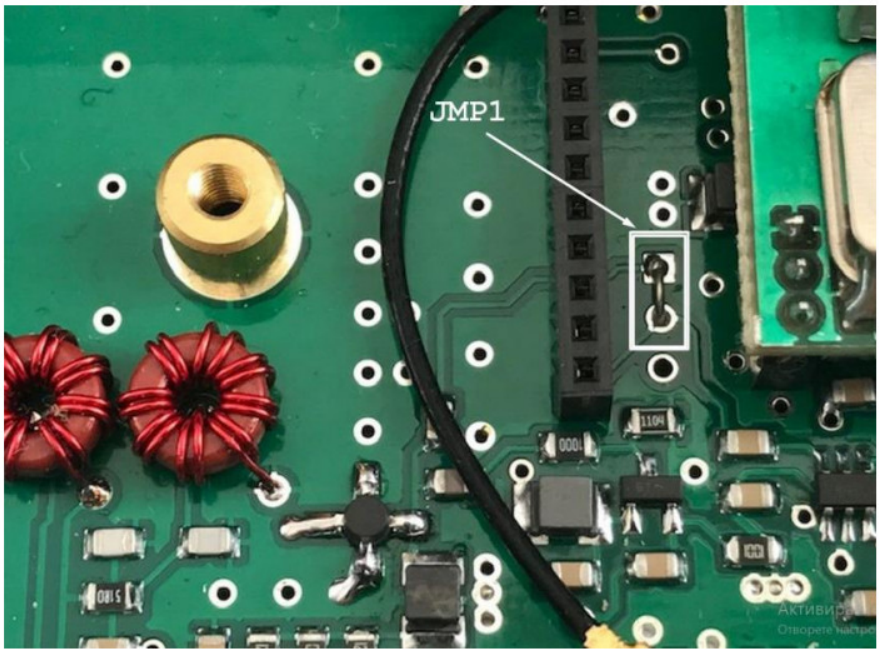
3.1. Unscrew 4 black screws and lift top cover. Disconnect speaker connector if needed.



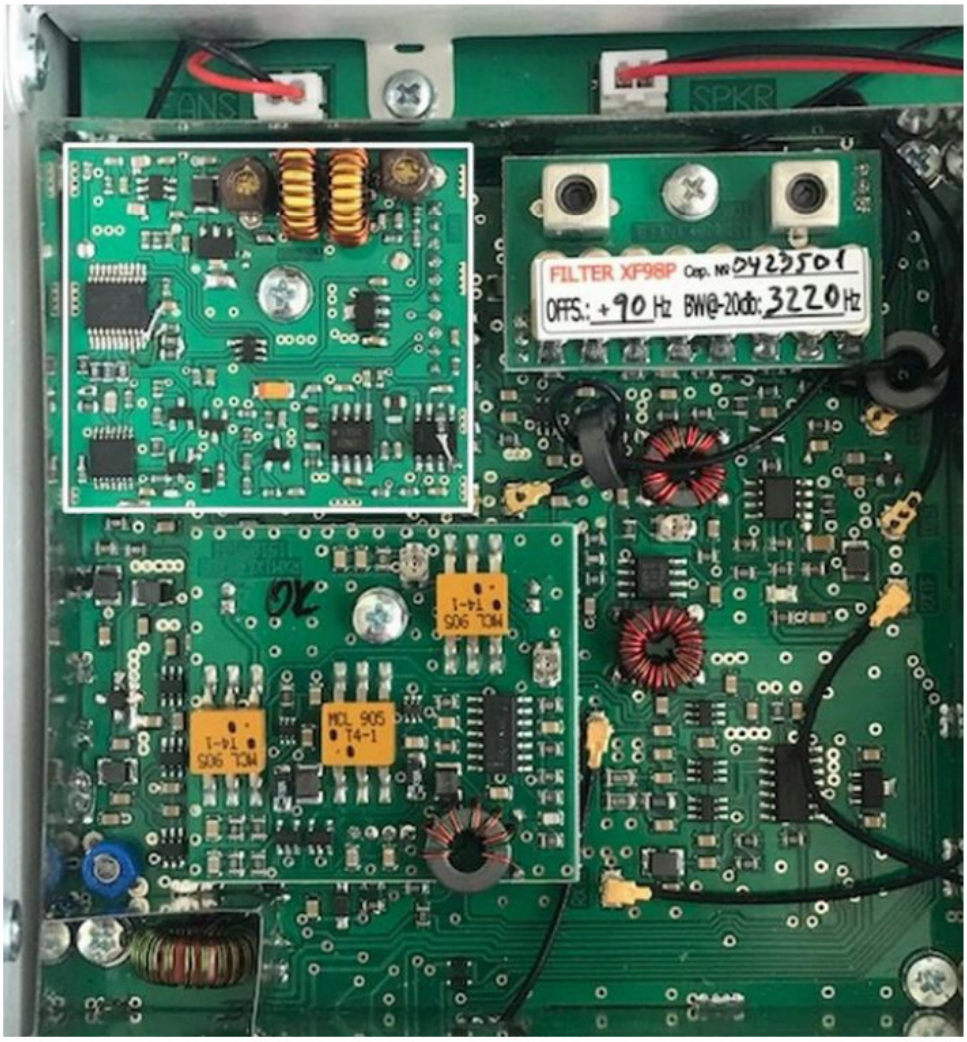

3.2. Locate shielded board – RF MIXER on the left side.
3.3. Remove two solder blobs and lift RF MIXER shield cover.




3.4. Remove (desolder or cut) jumper JMP1 on RF MIXER board.




3.5. Place NB optional board same way as shown on the picture.
**Note:** Carefully align the module on its place. Board pin header must mate corresponding socket on RF MIXER PCB! Failure to do this may destroy NB circuitry.
Secure the board with supplied M3mm screw and lockwasher.

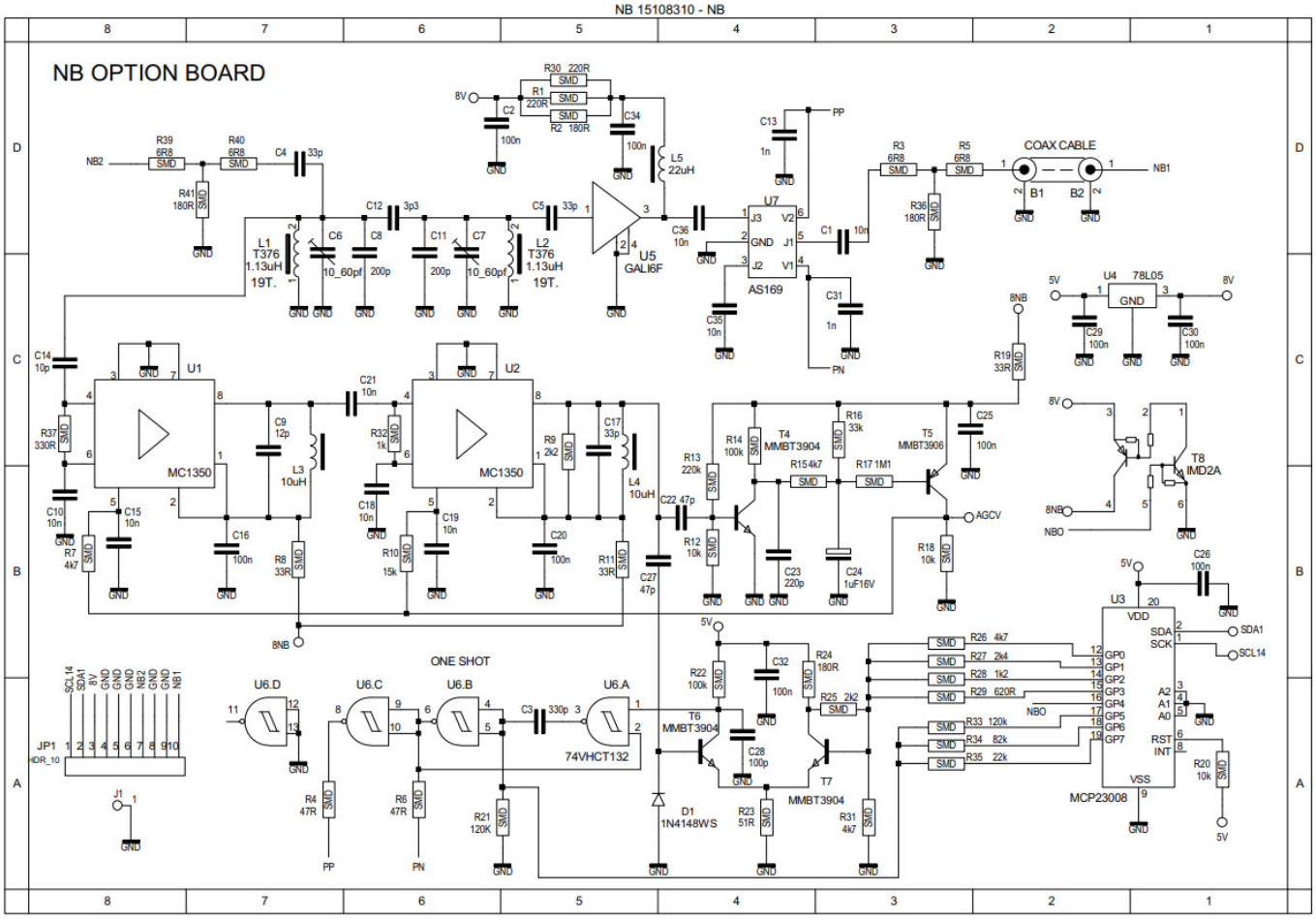



3.6. Place and solder shield cover on its place on RF MIXER board.
3.7. Place top cover, connect the speaker (if disconnected) and secure with 4 black screws.

## Theory of operation

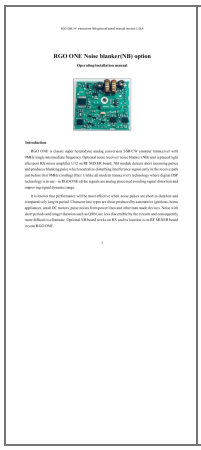
The noise blanker module is inserted into the receive IF path between post mixer amplifier U12 and first crystal (roofing) filter CF1. Input band-pass filter L1,C6,C8,C12,L2,C7,C11 on 9MHz provides needed time delay (~4µSec) and bandwidth 130kHz. Then U5 compensates for signal loss in input filter and attenuator. U7 acts as noise gate and is controlled by one shot multivibrator circuit U6 and high speed comparator T6,T7.
Signal from IF 9MHz is tapped by C10 and further amplified by U1,U2 and ALC circuit T4,T5. Short noise pulses does not activate ALC circuit so they can trigger following circuits – comparator, one-shot and noise gate.
Noise blanker operation is controlled by front panel microprocessor and I² C internal interface bus and U3 – 8 bit I/O expander.
Comparator threshold level is controlled by R26,R27,R28,R29,R31 and U3. One shot pulse width is controlled by C3, R21,R33,R34,R35 and U3.

## Schematic diagram




# RGO ONE

## Documents / Resources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