RETEVIS

USER'S MANUAL

RB86
GMRS mobile radio
- NOAA   • IP67 waterproofed   • stun and activate
- Emergency alraming function   • Remote kill

CE FC RoHS

MADE IN CHINA

Main Functions

GMRS frequency

NOAA

Emergency alarming

5 programmable functional keys

IP67 waterproof function

DTMF decoding and encoding

Color LCD Display

2Tone/5Tone decoding and encoding

CTCSS/DCS encoding and decoding

Remote kill/stun and activate

1750Hz tone

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To Customers

Thank you very much for using two way radios. This product has a newly developed function menu and humanism operation design, making it easy to use. It will meet your requirement by the compact size and reasonable price.

For downloading further resources:
Brochures, Software/Firmware, Manual etc, Pls contact your direct reseller first OR go to website retevis.com and check "support" in the each product link to download it.

Contents

Users Safety Information

- Do not attempt to configure your transceiver while driving.
- This transceiver is designed for a 13.8V DC power supply. Do not use a 24V battery to power on the transceiver.
- Please keep it away from interferential devices (Such as TV s, generators, etc.)
- Do not expose the transceiver to long periods of direct sunlight or place it close to heating appliances.
- If an abnormal odour or smoke is detected coming from the transceiver, turn off the power immediately and contact your dealer.
- Do not transmit with high power for extended periods or the transceiver may overheat.

Package Includes

- Radio unit x 1
- Keypad DTMF microphone x 1
- Mobile mounting bracket x 1
- DC power cable with fuse holder x 1
- Screw packs x 1
- Protection fuses x 1
- User manual x 1

Main Features

RB86 mobile radio has nice housing, stoutness & stability, advanced and reliable functions, perfect & valuable. This amateur mobile radio especially designs for drivers and it pursues company philosophy of innovation and practicality. More functions as follows:
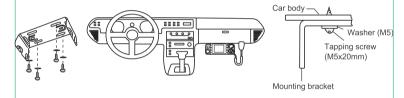
- Distribute buttons reasonably, convenient for operation. Adopt superior quality material, better technology and high quality radiator to ensure stable and durable operation.
- IP 67 waterproof (Optional)
- 1750/2100/1000/1450 Tone
- Automatic power-off
- 200 programmable memorized channels, identified by editing name.
- Programming different CTCSS, DCS, 2Tone, 5Tone in per channel, rejecting extra calling from other radios.
- Different bandwidth per channel, 25K for wide band, 20K for middle band, or 12.5K for narrow band.
- Five programmable multi-functional keys, can set various shortcut operation according to different requirement.

Initial Installation

Mobile Installation

To install the transceiver select a safe and convenient location inside your vehicle that minimizes danger to your passengers and yourself while the vehicle is in motion. Consider installing the unit at an appropriate position so that knees or legs will not strike it during sudden braking of your vehicle. Try to pick a well ventilated location that is shielded from direct sunlight.

1. Install the mounting bracket in the vehicle using the supplied self-tapping screws and flat washers.

Car body
A
Washer (M5)
Tapping screw
(M5x20mm)

Mounting bracket

2. Position the transceiver, the insert and tighten the supplied hexagon SEMS screws.

   ▪ Double check that all screws are tightened to prevent vehicle vibration from loosening the bracket or transceiver.

▪ Determine the appropriate angle of the transceiver, using the 3 screw hole positions on the side of the mounting bracket.
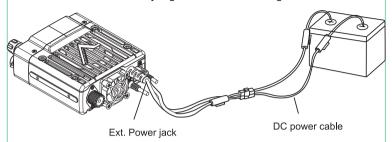
DC Power Cable Connection

Note: Locate the power input connector as close to the transceiver as possible.

The vehicle battery must have a nominal rating of 12V. Never connect the transceiver to a 24V battery. Be sure to use a 12V vehicle battery that has sufficient current capacity. If the current to the transceiver is insufficient the display may darken during transmission or transmitting output power may drop excessively.

1. Route the DC power cable supplied with the transceiver directly to the vehicle's battery terminals using the shortest path from the transceiver. We suggest you do not use the cigarette lighter socket as some cigarette lighter sockets introduce an unacceptable voltage drop. The entire length of the cable must be dressed so it is isolated from heat, moisture and the engine secondary (high voltage) ignition system/cables.

2. After installing the cable, in order to avoid the risk of damp, please use heat-resistant tape to tie together with the fuse box. Do not forget to reinforce the whole cable.

3. Confirm the correct polarity of the connections, then attach the power cable to the battery terminals: Red connects to the positive (+) terminal and black connects to the negative (-) terminal.

4. Reconnect any writing removed from the negative terminal.

5. Connect the DC power cable to the transceiver's power supply connector. Press the connectors firmly together until the locking tab clicks.

Ext. Power jack   DC power cable

Fixed Station Operation

In order to use this transceiver for fixed station operation you will need a separate 13.8V DC power supply (not included) .
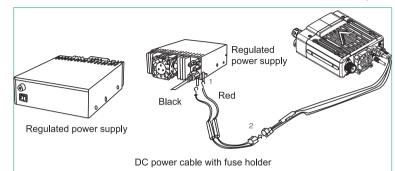Please contact your local dealer about it.
The recommended current capacity of your power supply is 12A.

1. Connect the DC power cable to the regulated DC power supply and ensure that the polarities are correct. (Red: positive; Black: Negative) .
   Do not directly the transceiver to an AC outlet.
   Use the supplied DC power cable to connect the transceiver to a regulated power supply.
   Do not substitute a cable with smaller gauge wires.

2. Connect the transceiver's DC power connector to the connector on the DC power cable.

3. Press the connectors firmly together until the locking tab clicks.

Note: Before connecting the DC power to the transceiver be sure to switch the transceiver and the DC power supply OFF.
Do not plug the DC power supply into an AC outlet until you make all connections.

Regulated power supply

Regulated power supply

Black   Red

DC power cable with fuse holder

Replacing Fuses

If the fuse blows, determine the cause then correct the problem. After the problem is resolved replace the fuse. If newly installed fuses continue to blow, disconnect the power cable and contact your local dealer for assistance.

Fuse Location	Fuse Current Rating
Transceiver	15A
Supplied Accessory DC power cable	20A

Only use fuses of the specified type and rating otherwise the transceiver could be damaged.

Note: If you use the transceiver for a long period when the vehicle battery is not fully charged or when the engine is OFF, the battery may become discharged and will not have sufficient reserves to start the vehicle. Avoid using the transceiver in these conditions.

Antenna Connection

Before operating install an efficient well-tuned antenna. The success of your installation will depend largely on the type of antenna and its correct installation. The transceiver can give excellent results if the antenna system and its installation are given careful attention.

Use a 50Ω impedance antenna and low-loss coaxial feed-line that has a characteristic impedance of 50Ω, to match the transceiver input impedance. Coupling the antenna to antenna to the transceiver via feed-lines having a impedance other than 50Ω reduces the efficiency of the antenna system and can cause interference to nearby broadcast TV receivers, radio receivers and other electronic equipment.
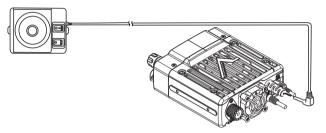
Note: Transmitting without first connecting an antenna or other matched load may damage the transceiver. Always connect the antenna to the transceiver before transmitting.
All fixed stations should be equipped with a lightning arrester to reduce the risk of fire, electric shock and transceiver damage.
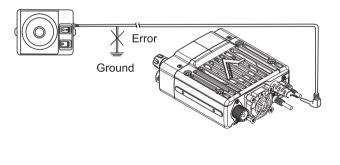
Accessories Connections

External Speaker

If you plan to use an external speaker, choose a speaker with an impedance of 8Ω. The external speaker jack accepts a 3.5mm mono (2-conductor) plug.
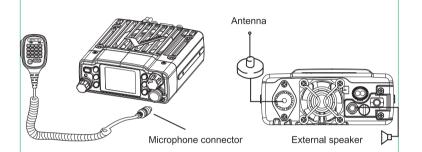
Note: External speaker output adopts double port BTL. Please be aware that the speaker can't connect to the ground otherwise the speaker will fault. The wrong connection way is as below:

Error

Ground

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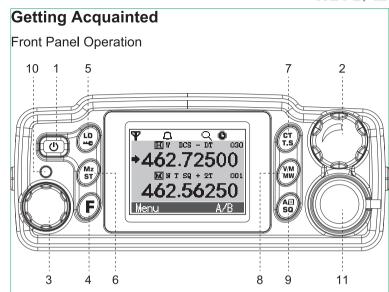
Microphone:

For voice communications, connect a microphone equipped insert into the modular socket on the side of the main unit and tighten the screw. Attach the supplied microphone hanger in an appropriate location using the screws includes included in the screw set.

Antenna

Microphone connector   External speaker

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Getting Acquainted

Front Panel Operation
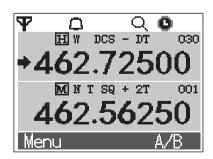
| NO.	Key	Function
1	POW (Power)	Power on/off
2	VOL	Adjust volume key
3	Main Dial	Change frequency, memory channel and scan direction etc.
4	F	Function key
5	Lo ( )	Short press to switch power output level
		Long press to switch the offset direction
6	Mz ST	/
7	CT (T.S)	Short press to switch CTCSS/DCS mode
8	V/M (M/V)	Long press to store the channel
9	A/B (SQ)	Short press to switch the home screen/sub screen
10	TX	Lights during transmitting
11	Mic. connector	Microphone connection port

Note: Lo/Mz/CT/V/M/A/B keys is multi-function keys, if users are reassigned these keys, the function would be different, please check the following functions.

Multi-Function Key	Function
A/B	Short press to switch the home screen/sub screen
LOW	Short press to switch the power output level
	Long press to switch the offset direction
MONI	Short press to start monitor
	Long press to turn on/off the channel name
SCAN	Short press to start scan
	Long press to whether the current channel is allowed to scan
TONE	Long press to switch the CTCSS/DCS mode
M/V	Short press to switch the frequency/channel mode
	Long press to store the channel
MHZ	Long press to adjust the frequency by 10M step
MUTE	Short press to reduce the volume by half

Display

```
 Y      Q      Q    O
     H  W  DCS - DT     030
   →462.72500
        M  N T SQ + 2T    001
    462.56250
   Menu              A/B
```
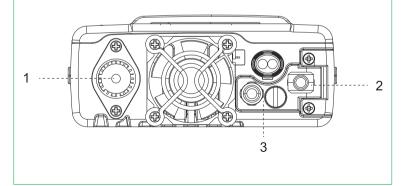
NO.	Icon	Function
1	OOO	Memory Channel Number
2	H M L	High Power Output / Middle Power Output / Low Power Output
3	W/M/N	Wide Bandwidth / Middle Bandwidth / Narrow Bandwidth Wide Band is not available for USA and Canada version.
4	DT/2T/5T	Signaling
5	T	CTCSS Encode
6	SQ	CTCSS Decode
7	DCS	DCS Encode and Decode
8	🔔	Beep
9	🕐	Auto Power-off
10	+	Positive Direction of Offset
11	–	Negative Direction of Offset
12	➡	Home Screen Position
13	🔍	Scan
14	🔑	Lock the Keypad

Rear Panel

```
1 ----              ---- 2


              3
```

Microphone

NO.	Port	Function
1	ANT	Connection for 50Ω antenna
2	DATA	PC programming data port
3	EXT SP	Terminal for optional external speaker

NO.	Icon	Function
1	PTT	Press the key to transmit
2	∧	Decrease volume or setting value
3	∨	Increase volume or setting value
4	MIC	Speak here during transmission
5	Indicate light	Indicate light will red during transmission
6	Number Key	Input channel number or DTMF dial out etc.
7	A/B	Exchange to the home screen and sub screen

Basic Operation

NOAA operation :
1. Menu 29th is for NOAA ON/OFF
2. When received NOAA signal , the radio will switch to 1st channel automatically

Note :
1. The 1st channel is the channel for received NOAA signal and can not be empty
2. NOAA function only work on the condition that the channel without optional signal and not on the 1st channel.

Emergency alarming operation:
1. Press F+Mz to activate the Emergency alarming function
2. Press LO key pr PTT to cancel

Switching the Power On/Off
According to the option selected during installation, press the 🔘 key for 1s to power on radio. Press the 🔘 key for 2s to power off radio.

Adjusting the Volume
Turn the VOL knob clockwise to increase the audio level, counterclockwise to decrease.

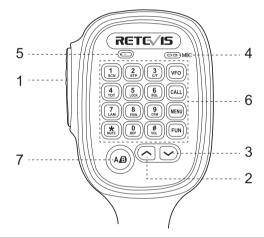**Note:** during the communication, volume can be adjusted more accurate.

In GMRS RB86, the frequency is fixed.

Adjusting Frequency/Channel through Selector Knob
You can change the current frequency to the desired one through selector knob; Turn clockwise to increase frequency, turn counterclockwise to

decrease. Every gear will increase or decrease one step; press the MHZ key, the integer of the frequency in screen will be flashing. In this status, you can turn the knob or press Mic's [∧/∨] key to adjust the frequency quickly by 1MHZ step.

In the channel mode, you can change the current channel to the desired one through turn knob, clockwise turn to the forward channel, anticlockwise turn to the backward channel. In relative working mode, press microphone's [∧/∨] key has same function for adjusting frequency and channel.

Note: When you press Mic's [∧/∨] key can't adjust the frequency/channel, please press the Mic's [#] key to switch the function of the [∧/∨] key.

Receiving

When the channel you are operating is called, the screen shows **RX** and field intensity, in this way, you can hear the calling from transmitting party.

Note: If the transceiver has set at higher squelch level, it may fail to hear the calling.

When the channel you are operating is called, the screen shows **RX** and field intensity, you can't hear the calling from transmitting party, it means current channel receives a matching carrier but unmatching signaling (Refer to CTCSS/DCS encode and decode or Optional Signaling set up).

Transmitting

Press **[MONI]** key to open monitor for a while to confirm the channel desired is not busy, press **[MONI]** key again to cancel the monitor, then press **[PTT]** key to speak into microphone.

Please hold the microphone approximately 2.5-5.0 cm from your lips, and then speak into the microphone in your normal speaking voice to get best timbre.

Note: Press and hold **[PTT]** key, LED light red and power intensity showed in screen indicates, that is means it is transmitting, release to receive.

Transmitting Tone-Pulse

Press and hold **[PTT]** key, then press Mic's [∨] key to transmit current selected tone-pulse signal.

Transmitting Optional Signaling

Press and hold **[PTT]** key, then press Mic's [∧] key to transmit pre-stored and selected DTMF/2Tone/5Tone optional signaling.

Channel Edit

1. Turn selector knob to select the desired frequency or input frequency by Mic's numeric keys.
2. Select the desired CTCSS/DCS signaling in the menu.
3. Long press **[M/V]** key, the channel number of screen will flashing
4. Turn selector knob to select the desired channel number to store. (if users want to store the frequency only, press Low key at first then operate the 5th instruction.)
5. Press **[F]** key or Mic's **[FUN]** key to stored current channel, press **[PTT]** key or Mic's **[MENU]** key cancel store.

Note: When under the memory channel mode, press **[MHZ]** key can store current information into VFO channel.

Channel Delete

1. Long press **[M/V]** key enter to the delete memory channel mode.
2. Turn selector knob to select the channel which you want to delete.
3. Press **[SCAN]** key to delete the current channel.

NOAA function

NOAA Weather Radio (NWR) is a nationwide network of radio stations broadcasting continuous weather information 24/7, direct from a nearby National Weather Service office. NOAA Weather Radio serves as an alerting device for any life-threatening emergency, whether it's weather-related or not.

NOAA Weather Radio All Hazards transmitters broadcast on one of seven VHF frequencies from 162.400 MHz to 162.550 MHz. The broadcasts cannot be heard on a simple AM/FM radio receiver. There are many receiver options, ranging from handheld portable units which just pick up Weather Radio broadcasts, to desktop and console models which receive Weather Radio as well as other broadcasts.

NOAA Weather Radio, also called NOAA All-Hazards Radio, broadcasts information on chemical spills, forest fires, and terrorist attacks, in addition to weather hazards. Therefore, it is your single source for comprehensive weather and emergency information. NOAA Weather Radios equipped with a special alarm tone feature can sound an alert and give you immediate information about a life threatening situation. During emergencies, NWS forecasters will interrupt normal routine weather radio programming and send out a special tone that activates weather radios in the listening area. NOAA Weather Radios with the SAME (Specific Area Message Encoding) capability use digital coding to automatically activate (turn on) and alert for specific weather or emergency conditions in specific areas. You can program NOAA Weather Radios with the SAME technology for the county or counties you desire. Some models even allow you to enable or disable certain alert types (Amber alerts, etc).

Emergency alarming function

Emergency alarm only use to transfer emergency situations, you can release a emergency all at any time and anywhere.

Shortcut Operations

Frequency Scan

This function is designed to monitor signal of every communicative frequency point of transceiver "step size" you have set.
1. In VFO mode, press [SCAN] key to enter into frequency scan
2. Turn selector knob or press Mic's [∧/∨] key to change scan direction.
3. Press [SCAN] key or Mic's [FUN] key to exit.

Offset Direction and Offset Frequency Set up

Repeater receives a signal (UP-LINK) on one frequency and re-transmits on another frequency (DOWN-LINK). The difference between these two frequencies is called the offset frequency. If the UP-LINK frequency higher than DOWN-LINK frequency, the direction is positive, if it is lower, the shift direction is negative.

1. Long press [LOW] key, the LCD displays offset direction and offset frequency.
2. Repeatedly long press [LOW] key to select positive offset and negative offset.
3. When LCD displays [+] icon, it indicates positive offset, which means transmitting frequency higher than receiving frequency.
4. When LCD displays [-] icon, it indicates negative offset, which means transmitting frequency lower than receiving frequency.
5. Turn selector knob or Mic's [∧/∨] key to change offset frequency, offset frequency changed as per stepping.
6. Press [A/B] key or [PTT] key to exit into standby.

Note: 1. Offset frequency value can be inputted by Mic's numeric keys, the input method is same as method of input frequency.
2. Under channel mode, this operation can be temporarily used by user. Once the radio is turned off or switched to another channel, the temporary setting will be erased.

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Operation of the composite key

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon flashing, then press composite key "X".
2. Repeatedly press composite key "X" to switch the corresponding list.
3. Press **[F]** key or **[PTT]** key to exit.

Beep (FUN+0)

1. Press **[F]** key or Mic's **[FUN]** key, the LCD displays **[Menu]** icon is flashing, then press Mic's **[0]** key, LCD display "⬚" icon, that is means the function of keypad tone is opened.
2. Repeatedly the above operation, when the "⬚" icon is disappear, this function is disable.

Channel Scan (FUN+1)

In channel mode, this function is designed to monitor signal in every channel.
1. In channel mode, press **[Scan]** key or press **[FUN]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press Mic's **[1]** key, then LCD displays ⬚ icon, then can enter into channel scan.
2. Turn selector knob or press Mic's **[∧/∨]** key to change scan direction.
3. If the boundary channel is useful, press **[MHZ]** key or Mic's **[FUN]** key can change the scan type to scan in the boundary channel.
4. Press **[Scan]** key or Mic's **[FUN]** key to exit.

CTCSS/DCS Frequency Setting (FUN 3/Tone)

This function is used to receive and transmit CTCSS/DCS frequency.
(The current channel should be have CTCSS/DCS)
1. When the current channel have CTCSS/DCS, press **[FUN]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the **[Tone]** key or Mic's **[3]** key enter to adjust the CTCSS/DCS.

2. Turn selector knob to change the CTCSS/DCS
   If there is CTCSS, press **[F]** key can switch to the CTCSS setting
   If there is DCS, press **[F]** key to set the Positive and negative direction of the DCS.
3. Press **[PTT]** key or Mic's **[FUN]** key to exit.

TOT (FUN+4)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the Mic's **[4]** key enter to adjust the TOT.
2. Press the **[4]** key to change the time of the TOT.

Keypad Lockout (FUN+5)

Squelch Level Setting (FUN+6/A/B)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the Mic's 6/A/B key enter to the squelch level setting to switch the level: 0~9 of squelch level.

LCD Backlight Display Time Setting (FUN+7)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the Mic's **[7]** key to switch the backlight display time: Normally open/5s/10s

High/Mid/Low Power Selection (FUN+8)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the Mic's **[8]** key to switch the power: High/Mid/Low.

DTMF Current Channel Edit (FUN+9/Scan)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the **[Scan]** key or Mic's **[9]** key, enter the DTMF channel edit mode, it can edit the current channel (If user wants to edit other DTMF channel,