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MADE IN CHINA

USER'S MANUAL

RB86

GMRS mobile radio

- NOAA
- IP67 waterproofed
- stun and activate
- Emergency alraming function
- Remote kill

RETEVIS

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

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.

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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:

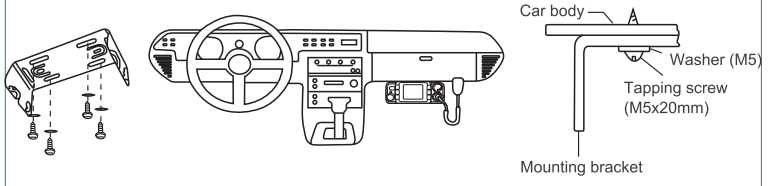
- Distribute buttons reasonably, convenient for operation. Adopt superior quality material, better technology and high quality radiator to ensure stable and durable operation.
- IP 67 waterproof (Optional)
- 1750/2100/1000/1450 Tone
- Automatic power-off
- 200 programmable memorized channels, identified 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

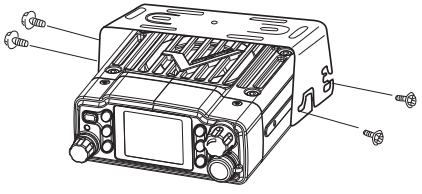
Mobile Installation

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.

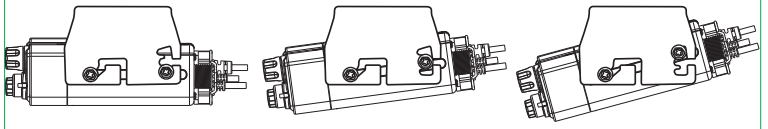
1. Install the mounting bracket in the vehicle using the supplied self-tapping screws and flat washers.



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.



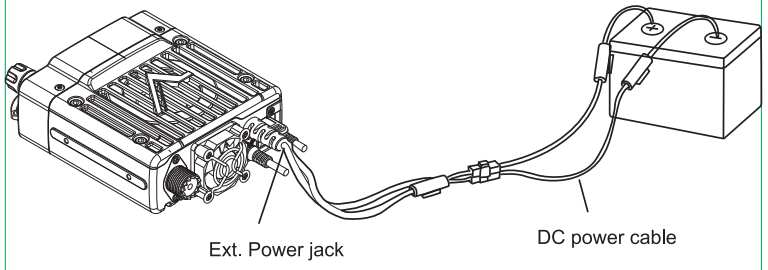
DC Power Cable Connection

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.

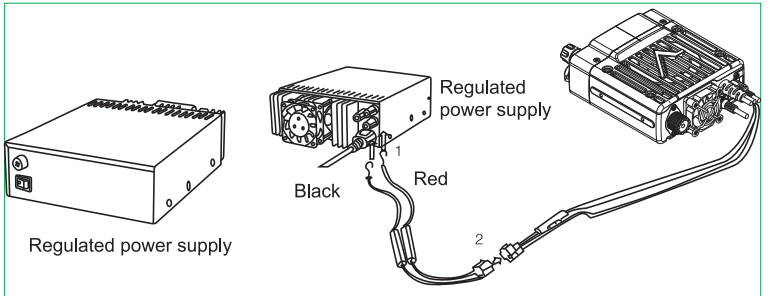


Fixed Station Operation

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.

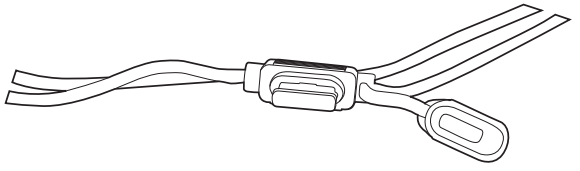
Note: Before connecting the DC power to the transceiver be sure to switch the transceiver and the DC power supply OFF.
Do not plug the DC power supply into an AC outlet until you make all connections.



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.

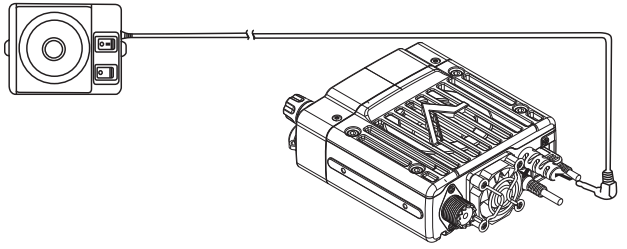
Note: Transmitting without first connecting an antenna or other matched load may damage the transceiver. Always connect the antenna to the transceiver before transmitting.

All fixed stations should be equipped with a lightning arrester to reduce the risk of fire, electric shock and transceiver damage.

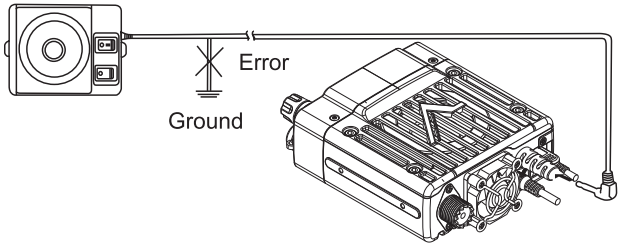
Accessories Connections

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.

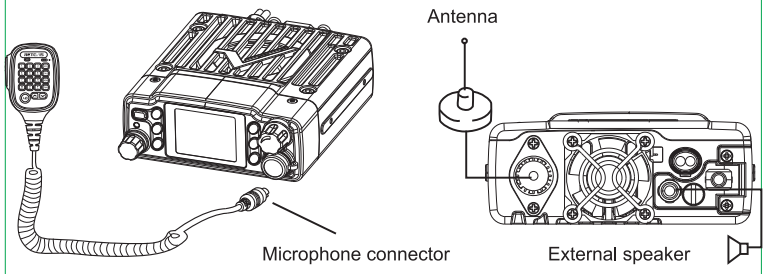


Note: External speaker output adopts double port BTL. Please be aware that the speaker can't connect to the ground otherwise the speaker will fault. The wrong connection way is as below:



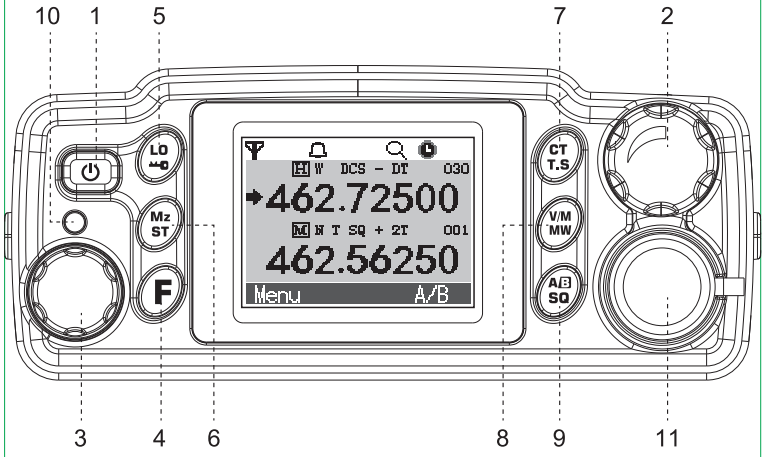
Microphone:

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.



Getting Acquainted

Front Panel Operation

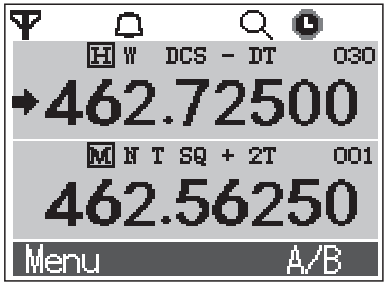


NO.	Key	Function
1	POW (Power)	Power on/off
2	VOL	Adjust volume key
3	Main Dial	Change frequency, memory channel and scan direction etc.
4	F	Function key
5	Lo ( )	Short press to switch power output level
		Long press to switch the offset direction
6	Mz ST	/
7	CT (T.S)	Short press to switch CTCSS/DCS 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.

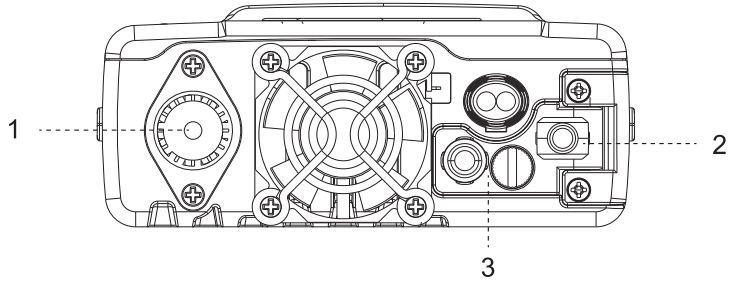
Multi-Function Key	Function
A/B	Short press to switch the home screen/sub screen
LOW	Short press to switch the power output level
	Long press to switch the offset direction
MONI	Short press to start monitor
	Long press to turn on/off the channel name
SCAN	Short press to start scan
	Long press to whether 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



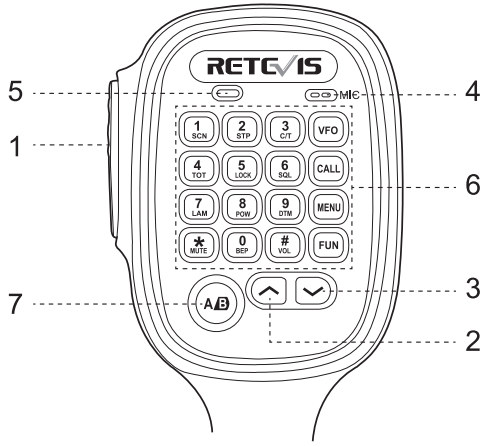
NO.	Icon	Function
1	000	Memory Channel Number
2	H M L	High Power Output / Middle Power Output / Low Power Output
3	W/M/N	Wide Bandwidth / Middle Bandwidth / Narrow Bandwidth Wide Band is not available for USA and Canada version.
4	DT/2T/5T	Signaling
5	T	CTCSS Encode
6	SQ	CTCSS Decode
7	DCS	DCS Encode 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



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.

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,

please change the channel in the menu at first).

2. Press the Mic's **[∧/∨]** key or **[Low] / [Moni]** to adjust the character position by last bit or next bit.
3. Turn the selector knob to change the current character or use microphone to input the corresponding character directly.
4. Press **[A/B]** key to save the current content. Press **[MHZ] / [Menu]** key to delete the current character.
5. Press **[PTT]** key to exit.

Channel Copied Quickly (FUN+Call)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press **[Call]** key to copy the content of current channel to the next memory channel.

Talk Around (FUN+*)

The transmitting frequency will same with the receiving frequency if turn on this function.

Note: This function is useless if there is not have offset frequency between transmitting frequency and receiving frequency of the current channel.

Reverse Frequency (FUN+#)

When users turn on this function, the transmitting frequency and receiving frequency would be exchange, the frequency of transmitting would be changed to the receiving frequency, the frequency of receiving would be changed to the transmitting frequency. If the current channel has set the CTCSS/DCS signaling, the CTCSS/DCS encode and CTCSS/DCS decode would be exchanged.

Note: This function is useless if there is not have offset frequency between transmitting frequency and receiving frequency of the current channel.

Menu

1. Signaling
2. Scan
3. Setting
   Radio setting
   Radio Info
   Radio setting

Function	vailable Values
Function	Available Values
Signal Select	OFF/DTMF/2Tone/5Tone
Sql Model	SQL/Sig
Power Level	Hig Power/Mid Power/Low Power
Bandwidth	Width/Middle/Narrow
CTC/DCS	Ctc Encode/Ctc Decode/Dcs Encode/Dcs Decode
Busy Lock	OFF/CTC/DCS/Carrier
DTMF ID	001
5Tone ID	12345
TOT	Infinite/1/2…/30Minutes
Auto Power Off	OFF/30/60/120Minutes
DTMF Sending Time	50/100/200/300/500MS
Sql Level	OFF/LEV 1/…LEV 9
Scan Mode	TO/CO/SE
Display Mode	Vfo Mode/CH Display Mode/MR Display Mode
TBST Fre	1750HZ/2100HZ/1000HZ/1450HZ
Password Lock	OFF/ON
Back Light	On/5S/10S
Step	2.5K/5K/6.25K/7.5K/8.33K/10K/12.5K/15K/20K
	/25K/30K/50K

Function	vailable Values
Sub Screen	OFF/frequency/Voltage
KeyFun Lo	A/B/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE
KeyFun Mz	A/B/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE
KeyFun CT	AB/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE
KeyFun V/M	AB/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE
KeyFun AB	AB/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE
Instr Screen	OFF/Char String/Picture
Ch Display	Frequency/Name
TX Chanel	Last Receive/Select
TX Inh	Tx Enable/Tx Inhibit
Reset	Factory/Set up
Sub Screen Prompt	Enable/Disable

Menu Operation

Procedure:

1. Short press [Menu] key or long press [F] key enter into the menu mode.
2. Turn selector knob or [+/-] key to select the desired menu number.
3. Press [F] key ,then turn selector knob or press [+/-] key to select the desired parameters
4. After the set, press the [F] key or [Menu] key to saved and returned to the higher level menu, press the [A/B] key or [Vfo] key to cancel and returned the higher level menu.
5. Press [PTT] key to exit.

Menu: Signal Select

Function: Select the Signaling Type

Available Values: OFF/DTMF/2Tone/5Tone

Default: OFF

Menu: Squelch Mode

Function: Squelch Mode Setting

Available Values: SQL/Sig

Default: SQL

Menu: Power Level

Function: Power Setting

Available Values: Hig Power/Mid Power/Low Power

Default: High Power

Menu: Bandwidth Selection

Function: Bandwidth Setting

Available Values: Wide/Middle/Narrow

Default: Wide

Menu: CTCSS/DCS Selection

Function: CTCSS/DCS Frequency Setting

Available Values: Ctc Encode/Ctc Decode/Dcs Encode/Dcs Decode

Menu: Busy Lock

Function: Busy Channel Lockout Setting

Available Values: Off/CTCSS/Carrier

Default: OFF/CTC/DCS/Carrier

Menu: DTMF ID

Function: Display Radio DTMF ID

Menu: 5 Tone ID

Function: Display Radio 5 Tone ID

Menu: TOT

Function: Set the Time-out Timer

Available Values: Infinite/1~30Minutes

Default: 6 Mins

Menu: Auto Power Off

Function: The radio will power-off when there is no operation for a specified period of time

Available Values: OFF/30/60/120 Minutes

Default: OFF

Menu: DTMF Sending Time

Function: Set the DTMF sending Time

Available Values: 50/100/200/300/500MS

Default: 50MS

Menu: Sql Level

Function: Adjust the Squelch Level

Available Values: OFF/LEV1~LEV9

Default: 5

Menu: Scan Mode

Function: Select the Scan Mode

Available Values: TO/CO/SE

Default: CO

Menu: Display Mode

Function: Select the Display Mode

Available Values: Vfo Mode/CH Display Mode/MR Display Mode

Default: Frequency

Menu: TBST Fre

Function: Select the TBST Frequency

Available Values: 1750/2100/1000/1450

Default: 1750

Press [PTT] + Mic's [∨] key to transmit

Menu: Password Lock

Function: Turn On/Off the Password

Available Values: OFF/ON

Default: OFF

Note: the default password "000000" can input by programming software, input the exactly password can enter the standby interface. Press Mic's [MENU] key to empty the inputted password.

Menu: Back light

Function: Set the Backlight

Available Values: ON/ 5S/10S

Default: ON

Menu: Step

Function: Select the Step

Available Values: 2.5/5/6.25/7.5/8.33/10/12.5/15/20/25/30/50K

Default: 12.5k

Menu: Skip

Function: Whether the Current Channel is allowed to Scan

Available Values: Enable/Disable

Default: Enable

Menu: Sub Screen

Function: Display Type of Sub Screen

Available Values: OFF/Frequency/Voltage

Default: Voltage

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

Default: LOW

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

Default: LOW

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

Default: MHZ

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

Default: Tone

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/Scan/Tone/M/V/MHZ/Mute

Default: V_M

Menu: Instr Screen

Function: Select the Instr Screen

Available Values: OFF/Picture/Character

Default: OFF

Menu: TX Channel

Function: this function is priority transmission

Last receive: it will use the frequency or channel in the last communication to transmit.

Select: it will use the selected frequency and channel to transmit.

Menu: Transmit Disabled

Function: Turn on/off the Transmit Disabled

Available Values: Enable/Disable

Default: Enable

Menu: Reset

Factory reset is to reset all the settings, including memory channels and menu settings Setup reset is to reset menu settings, but keep memory channels you stored.

Menu: Sub Screen Ring

Function: If there have voice prompt when the sub screen receiving the signal.

Available Values: OFF/ON

Key Setting

AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

1. A/B key
   Short press: Switch the home screen/sub screen
2. LOW key
   Short press: Switch output power level
   Long press: Switch the frequency offset direction
3. MONI key
   Short press: Start the monitor
   Long press: Turn on/off the channel name display
4. SCAN key
   Short press: Start scan
   Long press: Turn on/off scan
5. TONE key
   Short press: switch the CTCSS/DCS mode
6. M/V key
   Short press: Switch frequency/channel mode
   Long press: Store the channel
7. MHZ key
   Short press: 1M step
   Long press: 10M step
8. MUTE key
   Short press: Volume halving

Other keys

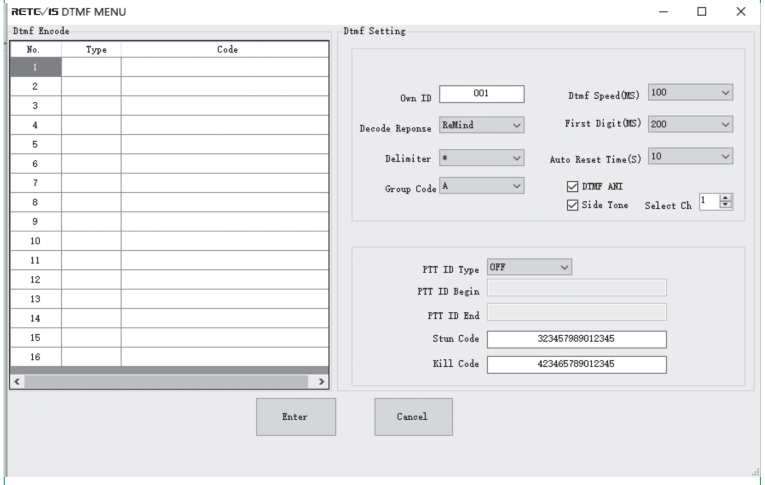
1. Mic's VFO key, In GMRS RB86, VFO is unvalible.
   Short press: Switch frequency/channel mode

2. Mic's CALL key
   Short press: Signaling call
3. Mic's MENU key
   Short press: Set Menu
4. Mic's Fun key
   Short press: Switch on composite key
5. Mic's * key
   Short press: Volume halving
6. Mic's # key
   Switch the function of the Mic's +/- key: Volume/frequency halving
7. Mic's A/B key
   Short press: Switch the home screen/sub screen

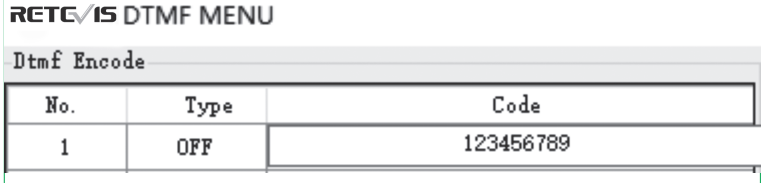
DTMF operation

DTMF decoding (In programming software)

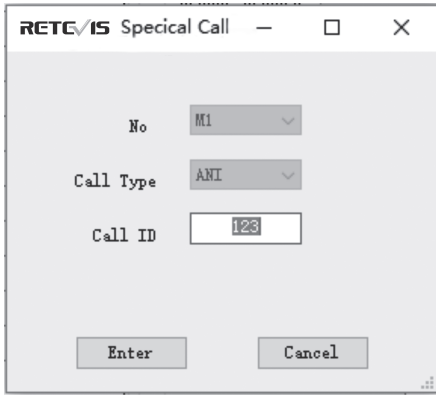
1. Select the DTMF encode type



1）“OFF”, users can input the desired DTMF code directly

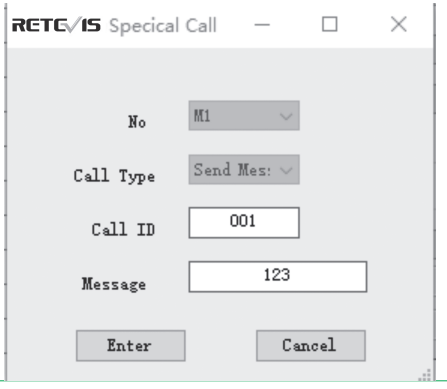


2）“ANI” , users only should input the call ID, which is called radio ID



3）“Message” , users should input the call ID firstly which is called radio ID, and then input the Message.

Note: Because DTMF does a long time for message, this function only supports simple message function.



DTMF setting

Stun code: when the radio receives the corresponding DTMF code, the radio will be remote stunned and disabled transmit.

Kill code: when the radio receives the corresponding DTMF code, the radio will be remote killed and disabled receive and transmit.

Select Ch: The default channel when the DTMF is calling

DTMF operating

When the signaling of channel selects the DTMF, the current channel will automatically check if the DTMF signaling is received and decoding it. And achieve a corresponding function according to the received code. The function including: Turn on the squelch, ANI display, message, remote stun, and remote kill.

Note: when the radio is remote stunned or killed, it can be released by programming.

2 Tone Operation

2 Tone encode

Input: the frequency of first tone and second tone

Note: the frequency between of the first tone and second tone should not too similar to avoid the decoding is wrong.

2 Tone decode

Decode Format: the combination of decode, for example: A-B, you should make sure the frequency of first tone is A, and second tone is B. other combination is similar.

5 Tone Operation

5 Tone encode

The write way is same with the DTMF.

5 Tone decode

Function: The function will be achieved when the radio receives the corresponding code.

Select: Turn on squelch

Stun/kill: same with DTMF

Wake: release the state of stun/kill

Simple Trouble Shooting

Problem	Possible Causes and Potential Solutions
(a) Power is on, nothing appears on Display.	+ and - polarities of power connection are reversed. Connect red lead to plus terminal and black lead to minus terminal of DC power supply.
(b) Fuse is blown.	Check and solve problem resulting in blown fuse and replace fuse with new fuse.
(c) Display is too dim.	Dimmer setting is “LAMP-L”. Please make the dimmer setting “LAMP-H”.
(d) No sound comes from speaker.	Squelch is muted. Decrease squelch level. Tone or CTCSS/DCS squelch is active. Turn CTCSS or DCS squelch off.
(e) Key and Dial do not function.	Key-lock function is activated. Cancel Key-lock function.
(f) Rotating Dial will not change memory channel.	Transceiver is in CALL mode. Press the VFO or memory mode.
(g) PTT key is pressed but transmission does not occur.	Microphone connection is poor. Connect microphone properly. Antenna connection is poor. Coonect antenna properly.

Specifications

General

Frequency	GMRS
Channel	200
Frequency stability	±1ppm
Operating temperature	-30℃~+60℃
Operating voltage	13.8V DC
Dimension	107x125x45mm

Receiver

Sensibility	0.2μV
Adjacent channel selectivity	60dB@12.5KHz 70dB@25KHz
Inter modulation	≥60dB/≥65dB
Spurious rejection	≥70dB
Audio response	+1~-3dB
Audio distortion	<5%
FM hum and noise	≥45dB@25KHz ≥40dB@12.5KHz
Rated audio	3W

RETEVIS

Transmitter

Channel No	TX	RX	Max Power	Sub Audio
1	462.5625	462.5625	5	67.0
2	462.5875	462.5875	5	118.8
3	462.6125	462.6125	5	127.3
4	462.6375	462.6375	5	131.8
5	462.6625	462.6625	5	136.5
6	462.6875	462.6875	5	141.3
7	462.7125	462.7125	5	146.2
8	/	/		
9	/	/		
10	/	/		
11	/	/		
12	/	/		
13	/	/		
14	/	/		
15	462.5500	462.5500	20	123
16	462.5750	462.5750	20	D743I
17	462.6000	462.6000	20	D332I
18	462.6250	462.6250	20	127.3
19	462.6500	462.6500	20	D243I
20	462.6750	462.6750	20	D606N
21	462.7000	462.7000	20	D731I
22	462.7250	462.7250	20	136.5
23	467.5500	462.5500	20	136.5
24	467.5750	462.5750	20	136.5
25	467.6000	462.6000	20	136.5
26	467.6250	462.6250	20	136.5
27	467.6500	462.6500	20	136.5
28	467.6750	462.6750	20	136.5
29	467.7000	462.7000	20	136.5
30	467.7250	462.7250	20	136.5

RF ENERGY EXPOSURE AND PRODUCT SAFETY GUIDE FOR PORTABLE TWO-WAY RADIOS

ATTENTION!	Before using this radio, read this guide which contains important operating instructions for safe usage and rf energy awareness and control for compliance with applicable standards and regulations.

This two-way radio uses electromagnetic energy in the radio frequency (RF) spectrum to provide communications between two or more users over a distance. RF energy, which when used improperly, can cause biological damage.
All Retevis two-way radios are designed, manufactured, and tested to ensure they meet government-established RF exposure levels. In addition, manufacturers also recommend specific operating instructions to users of two-way radios. These instructions are important because they inform users about RF energy exposure and provide simple procedures on how to control it.
Please refer to the following websites for more information on what RF energy exposure is and how

Local Government Regulations
When two-way radios are used as a consequence of employment, the Local Government Regulations requires users to be fully aware of and able to control their exposure to meet occupational requirements. Exposure awareness can be facilitated by the use of a product label directing users to specific user awareness information. Your Retevis two-way radio has a RF Exposure Product Label. Also, your Retevis user manual, or separate safety booklet includes information and operating instructions required to control your RF exposure and to satisfy compliance requirements.

Radio License
Governments keep the radios in classification, business two-way radios operate on radio frequencies that are regulated by the local radio management departments (FCC, ISED, OFCOM, ANFR, BFTK, Bundesnetzagen-tur...).To transmit on these frequencies, you are required to have a license issued by them. The detailed classification and the use of your two radios, please contact the local government radio management departments.
Use of this radio outside the country where it was intended to be distributed is subject to government regulations and may be prohibited.

Unauthorized modification and adjustment
Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority granted by the local government radio management departments to operate this radio and should not be made. To comply with the corresponding requirements, transmitter adjustments should be made only by or under the supervision of a person certified as technically qualified to perform transmitter maintenance and repairs in the private land mobile and fixed services as certified by an organization representative of the user of those services.
Replacement of any transmitter component (crystal, semiconductor, etc.) not authorized by the local government radio management departments equipment authorization for this radio could violate the rules.

FCC Requirements:
This device complies with part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference. (Licensed radios are applicable);
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (Other devices are applicable)
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.
NOTE:
•This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate

radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
•This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
—Reorient or relocate the receiving antenna.
—Increase the separation between the equipment and receiver.
—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
—Consult the dealer or an experienced radio/TV technician for help.

CE Requirements:
•(Simple EU declaration of conformity) Shenzhen Retevis Technology Co., Ltd. declares that the radio equipment type is in compliance with the essential requirements and other relevant provisions of RED Directive 2014/53/EU and the ROHS Directive 2011/65/EU and the WEEE Directive 2012/19/EU; the full text of the EU declaration of conformity is available at the following internet address: www.retevis.com.
•Restriction Information
This product can be used in EU countries and regions, including: Belgium (BE), Bulgaria (BG), Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), France (FR), Croatia (HR), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), Netherlands (NL), Austria (AT), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI), Sweden (SE) and United Kingdom (UK).
For the warning information of the frequency restriction, please refer to the package or manual section.
•Disposal
The crossed-out wheeled-bin symbol on your product, literature, or packaging reminds you that in the European Union, all electrical and electronic products, batteries, and accumulators (rechargeable batteries) must be taken to designated collection locations at the end of their working life. Do not dispose of these products as unsorted municipal waste. Dispose of them according to the laws in your area.

IC Requirements:
Licence-exempt radio apparatus
This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:
(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :
(1) l'appareil ne doit pas produire de brouillage;
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure Information
•DO NOT operate the radio without a proper antenna attached, as this may damage the radio and may also cause you to exceed RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or an antenna specifically authorized by the manufacturer for use with this radio, and the antenna gain shall not exceed the specified gain by the manufacturer declared.
•DO NOT transmit for more than 50% of total radio use time, more than 50% of the time can cause RF exposure compliance requirements to be exceeded.
•During transmissions, your radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so.

•DO NOT operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.
•Portable Device, this transmitter may operate with the antenna(s) documented in this filing in Push-to-Talk and body-worn configurations. RF exposure compliance is limited to the specific belt-clip and accessory configura tions as documented in this filing and the separation distance between user and the device or its antenna shall be at least 2.5 cm.
•Mobile Device, during operation, the separation distance between user and the antenna subjects to actual regulations, this separation distance will ensure that there is sufficient distance from a properly installed externally-mounted antenna to satisfy the RF exposure requirements.
•Occupational/Controlled Radio, this radio is designed for and classified as "Occupational/Controlled Use Only", meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards; NOT intended for use in a General population/uncontrolled environment.
•General population/uncontrolled Radio, this radio is designed for and classified as "General population/uncon trolled Use".

RF Exposure Compliance and Control Guidelines and Operating Instructions
To control your exposure and ensure compliance with the occupational/controlled environment exposure limits, always adhere to the following procedures.
Guidelines:
•User awareness instructions should accompany the device when transferred to other users.
•Do not use this device if the operational requirements described herein are not met.

Operating Instructions:
•Transmit no more than the rated duty factor of 50% of the time. To Transmit (Talk), push the Push to Talk (PTT) button. To receive calls (listen), release the PTT button. Transmitting 50% of the time, or less, is important because the radio generates measurable RF energy exposure only when transmitting in terms of measuring for standards compliance.
•Transmit only when people outside the vehicle are at least the recommended minimum lateral distance away from a properly installed according to installation instructions, externally mounted antenna.
•When operating in front of the face, worn on the body, always place the radio in a Retevis approved clip, holder, holster, case, or body harness for this product. Using approved body-worn accessories is important because the use of Non-Retevis approved accessories may result in exposure levels, which exceed the IEEE/ICNIRP RF exposure limits.

Hand-held Mode
• Hold the radio in a vertical position with the microphone (and other parts of the radio including the antenna) at least 2.5 cm (one inch) away from the nose or lips. The antenna should be kept away from the eyes. Keeping the radio at a proper distance is important as RF exposure decreases with increasing distance from the antenna.

Phone Mode
•When placing or receiving a phone call, hold your radio product as you would a wireless telephone. Speak directly into the microphone.

Electromagnetic Interference/Compatibility
NOTE: Nearly every electronic device is susceptible to electromagnetic interference (EMI) if inadequately shielded, designed, or otherwise configured for electromagnetic compatibility

Electromagnetic Interference/Compatibility
NOTE: Nearly every electronic device is susceptible to electromagnetic interference (EMI) if inadequately shielded, designed, or otherwise configured for electromagnetic compatibility

Avoid Choking Hazard

Small Parts. Not for children under 3 years.

Turn off your radio power in the following conditions:

WARNING

•Turn off your radio before removing (installing) a battery or accessory or when charging battery.
•Turn off your radio when you are in a potentially hazardous environments: Near electrical blasting caps, in a blasting area, in explosive atmospheres (inflammable gas, dust particles, metallic powders,
grain powders, etc.).
•Turn off your radio while taking on fuel or while parked at gasoline service stations.
To avoid electromagnetic interference and/or compatibility conflicts
•Turn off your radio in any facility where posted notices instruct you to do so, hospitals or health care facilities (Pacemakers, Hearing Aids and Other Medical Devices) may be using equipment that is sensitive to external RF energy.
•Turn off your radio when on board an aircraft. Any use of a radio must be in accordance with applicable regulations per airline crew instructions.

Protect your hearing:

WARNING

• Use the lowest volume necessary to do your job.
• Turn up the volume only if you are in noisy surroundings.
• Turn down the volume before adding headset or earpiece.
• Limit the amount of time you use headsets or earpieces at high volume.
• When using the radio without a headset or earpiece, do not place the radio's speaker directly against your ear
Protect your hearing:
• Use careful with the earphone maybe possible excessive sound pressure from earphones and headphones can cause hearing loss.
Note: Exposure to loud noises from any source for extended periods of time may temporarily or permanently affect your hearing. The louder the radio's volume, the less time is required before your hearing could be affected. Hearing damage from loud noise is sometimes undetectable at first and can have a cumulative effect.

Avoid Burns:

WARNING

Antennas
•Do not use any portable radio that has a damaged antenna. If a damaged antenna comes into contact with the skin when the radio is in use, a minor burn can result.
Batteries (If appropriate)
•When the conductive material such as jewelry, keys or chains touch exposed terminals of the batteries, may complete an electrical circuit (short circuit the battery) and become hot to cause bodily injury such as burns. Exercise care in handling any battery, particularly when placing it inside a pocket, purse or other container with metal objects.
Long transmission
•When the transceiver is used for long transmissions, the radiator and chassis will become hot.

Safety Operation:

WARNING

Forbid
•Do not use charger outdoors or in moist environments, use only in dry locations/conditions.
•Do not disassemble the charger, that may result in risk of electrical shock or fire.
•Do not operate the charger if it has been broken or damaged in any way.
•Do not place a portable radio in the area over an air bag or in the air bag deployment area. The radio may be propelled with great force and cause serious injury to occupants of the vehicle when the air bag inflates.
To reduce risk
•Pull by the plug rather than the cord when disconnecting the charger.
•Unplug the charger from the AC outlet before attempting any maintenance or cleaning.
•Contact Retevis for assistance regarding repairs and service.
•The adapter shall be installed near the equipment and shall be easily accessible

Approved Accessories

WARNING

•Contact Retevis for assistance regarding repairs and service.
•The adapter shall be installed near the equipment and shall be easily accessible
•This radio meets the RF exposure guidelines when used with the Retevis accessories supplied or designated for the product. Use of other accessories may not ensure compliance with the RF exposure guidelines and may violate regulations.
•For a list of Retevis-approved accessories for your radio model, visit the following website: http://www.Retevis.com