

OPERATION INSTRUCTION



RECYCLABLE PACKAGING



USER'S MANUAL

一、 Warning

- In order to avoid fire, damage or other emergencies, please follow the below rules while use the device:
- Don't use the mobile radio while driving.
 - Use the radio in flammable and explosive environment. Please turn off the mobile radio at the gas station.
 - The output power is 1.3W (PC), please don't change it by other power supply.
 - Please keep away from dusty, damp places, and don't put in the rugged surface.
 - Please keep away from interference environment.
 - Don't expose to sunlight or heating device.
 - Cut off the power which the device gives off strange smell. Make sure the device is safe then send for repairing.
 - Don't transmitting at high power, or will lead to overheated.
 - Don't insert this device by yourself.
 - Please follow your local law while using this device.

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二、 Device Checking

Thanks for choosing our radio please unbox and check whether the following accessories are included and well-packed. If there's anything missing or damaging after unboxed, please contact your local distributor

NO	Item	Quantity
1	Radio	1
2	Microphone	1
3	Holder	1
4	Screw	4
6	User Manual	1
7	Guarantee Card	1

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Transmitting Part	
Modulation Mode	F3E
Maximum deviation (W/N)	±5KHz / ±2.5KHz
Adjacent Power	70dB/60dB
SNR (W/N)	-40dB/-36dB
Audio Response	+1~-3dB (300Hz-3KHz)
Modulation Distortion	<5%
Receiving Part	
Sensitivity (W/N)	0.22 μV / 0.25 μV 12dB SINAD
Inter modulation (W/N)	65dB/60dB
Audio Distortion	<2%
SNR (W/N)	-45dB/-40dB
Audio Response	+1~-3dB (300Hz-3KHz)
Audio Output Power	≈ 3W (8 Ω)
RX Current	≈ 250mA
Standby Current	≈ 100mA

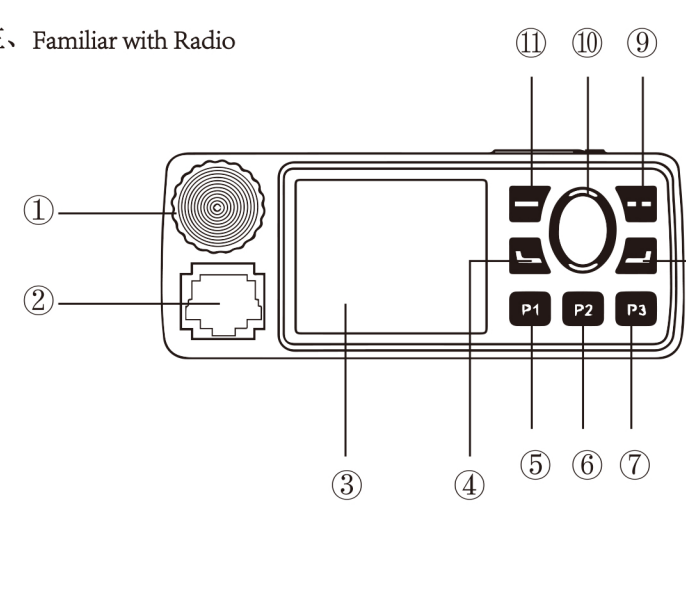
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七、 Specification

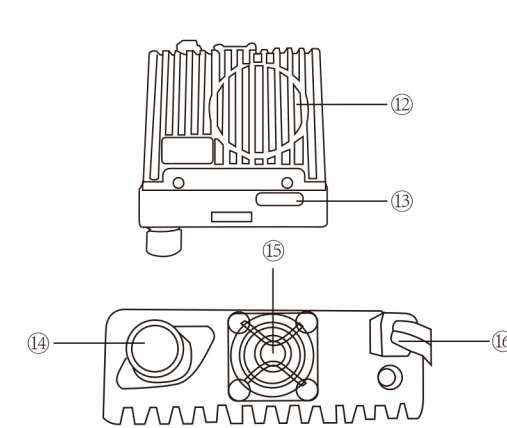
General Part	
Frequency Range	RX: 64-108MHz (turn on FM while used) 108-136MHz (aviation frequency band) 136-520MHz TX: 136-174MHz/400-520MHz
Channel Capacity	999
Channel Spacing (W/M)	25KHz/12.5KHz
Working Voltage	13.8V DC
Working Mode	Same frequency simplex, different frequency simplex
Antenna	Removable Antenna
Frequency Stability	±2.5ppm
Working Temperature	-20 ~ +60 C
Dimension	126 X 100 X 40 (without holder)
Weight	435g (without holder)

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三、 Familiar with Radio



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- Turn ON/OFF & Volume Button
- Hand-MIC & Earpiece Jack
- Definable Key 2
- Definable Key 3
- Confirm Key
- Speaker
- Left Key
- Right Key
- Right Key Slot
- Antenna Connector
- Definable Key 1
- UP/DOWN Key
- Radio Fan
- Power Cable

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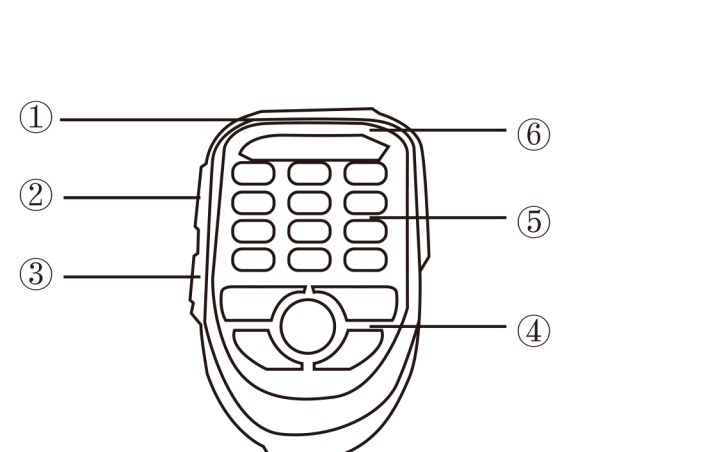
[RX Record] to turn on/off RX record.
[TX Record] to turn on/off TX record.
[Record Log] to check recorded voice, and the recording shown up as "sequence number + channel number + recording duration + recording time". Red characters means to transmit recording, blue characters means to receive recording. Press **[F]** to delete current recording. Press **[F]** to play current recording. Note: Do not remove the TF card arbitrarily, or the recording will not match.
[GPS] to turn on/off GPS.
[GPS Monitor] If the radio has GPS, please turn on the GPS and GPS Monitor, the radio will send the GPS module to the connected computer. The data can be parsed via GPS monitor software or port instrument. The baud rate of programming cable is Normal Mode 115200, Slow Mode 19200. Please turn off this rate while write or read data, or it will fail to write or read.
[UTC Area] to set UTC area to match local time.
[APRS] to set shut-off time to reduce power consumption.
[Initialize] to initialize the radio to the last writing status.
[Version] to check firmware version and version date.
[Instruction] to scan QR code to check with user manual.

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[K1 Long] to set **[P1]** long press function.
[K1 Short] to set **[P1]** short press function.
[K2 Long] to set **[P2]** long press function.
[K2 Short] to set **[P2]** short press function.
[K3 Long] to set **[P3]** long press function.
[K3 Short] to set **[P3]** short press function.
[DTMF Delay] to send DTMF code after a period of time.
[DTMF Duration] to set the duration of every DTMF code.
[DTMF Interval] to set the interval of 2 consecutive DTMF code while triggers transmitting. "TX End" means send fixed DTMF code after transmitting ends. "TX Start And End" means to send fixed DTMF code both at the startup or TX ends.
[DTMF Select] to preset 16 groups of DTMF codes, select one group in List DTMF Select, and the appointed code will be send out according to the setting of DTMF Mode.
[DTMF Display] to enable and show up the sender's DTMF code while receiving. Due to the sensitivity of DTMF code, regular communication may cause DTMF encode. If you don't want to know DTMF, turn off this function in the menu list.

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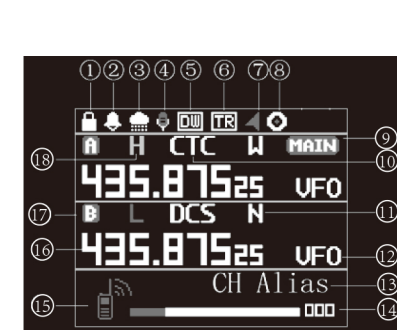
3.2 Hand-microphone



- Indicator Light
- PTT-1
- PTT-2
- Function Key Area
- Numeric Key Area
- MIC

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3.3 Screen



- Lock key & Remote Stun
- TX End Tone
- NOAA
- VOX
- Dual Band Standby
- Talk Around & Reverse Frequency
- GPS
- Voice Recording
- Main Working Frequency
- CTCSS/DCS
- Wide/Narrow Band
- VFO Frequency Mode or Channel Number Mode
- Channel Name
- Channel Strength or MIC Strength Indicator
- TX/RX Indicator or ON/OFF Fan Indicator
- Working Frequency
- AB Frequency Indicator
- High/Low Power

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[Busy Lock] to set busy lock. If carriers match, and the channel is not allowed to transmit no matter their CTCSS/DCS matches or not. If CTCSS/DCS matches successfully, the radio is not allowed to transmit.
[Scrambler] to set scrambler. Means turn off. We suggest to use scrambler 8.
[DCS Encrypt] when there is digital sub-tones on main frequencies, turn on encryption function will re-encrypt to digital sub-tones. Only supported to digital sub-tones.
[Write Code] this is non-standard DCS, can be defined to 23 or 24 digits. Press the **[▲]** or **[▼]** to choose CTCSS mode, input digits to become non-standard DCS code. The saved non-standard DCS code can be checked in this list.
[CH Name] to set channel name.
[Save CH] copy and save information of current channel to appointed channels. The CH-XXX NY shows up when enter the list. N means empty channel, Y means not empty channel.
[Delete CH] to delete channel.

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[NOAA Monitor] to turn on/off NOAA monitor while under the standby.
[FM Standby] to turn on/off receiving function while under FM radio.
[Tail Tone] to set tail tone.
[Scan DIR] to set scan direction.
[Scan Mode] TO: continue to scan after receiving.
[CO]: start to scan once the signal gone.
[SE]: stop scanning after receiving signal.
[Scan Time] to set standing time.
[Scan End] to exit scan.
[Personal ID] to set local ID.
[Repeater Mode] to switch working frequency to talk around or reverse frequency.
[CTCSS/DCS] to set CTCSS/DCS of main frequency via **[F]** key, and press **[▲]** or **[▼]** to switch them.
[RX CTCSS/DCS] to set RX CTCSS/DCS of main frequency.
[TX CTCSS/DCS] to set TX CTCSS/DCS of main frequency.
[TX Power] to set TX power.
[Band Width] to set band width.

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3.4 Radio and Hand-MIC Functions and Operations

Radio Keys	Hand-MIC keys	Function Description
ON/OFF/Volume		Short-press: lock/unlock the keypad Long-press: turn on/off the radio Clockwise: turn up the volume Anti-clockwise: turn down the volume
[F]	[MENU]	Short-press: confirm setting or into menu Long-press: into or exit DTMF input mode DTMF Code: A
[F]	[EXIT]	Short-press: cancel setting or exit menu, switching working frequency AB band Long-press: switch single/dual display DTMF Code: D

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Radio Keys	Hand-MIC keys	Function Description
[▲]	[▲]	Short-press: upward to switch frequency/channels/menu list Long-press: fast switching of frequencies/channels/menu list, FM scanning DTMF Code: B
[▼]	[▼]	Short-press: downward to switch frequency/channels/menu list Long-press: fast switching of frequencies/channels/menu list, FM scanning DTMF Code: C
[F]	[F]	Short-press: switch from channel report methods to channel name report or channel number report

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六、 Instruction of MENU
[Startup Logo] to turn on/off the image of startup.
[Ringtone] to turn on/off startup tone.
[Prompt Tone] to turn on/off startup greeting.
[Key Beep] to turn on/off keypad tone.
[Beep Beep] to turn on/off TX end tone.
[Dual Display] to turn on/off dual display.
[TX Priority] to switch priority transmitting to edition mode or busy mode. If set to edition mode, the radio transmits the signal under main channels. If set to busy mode, the main channel is set to the receiving channel to transmit signals under receiving.
[Freq Select] to set frequency switching and scanning frequency step.
[SQ Level] to set SQ level.
[LED Time] to set backlight time.
[Lock Time] to set the lock time.
[TX] to set the max TX time.
[VOX Level] to set VOX level.
[VOX Delay] to set VOX delay time.

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五、 Functions of Definable Keys
 To define **[P1]** / **[P2]** / **[P3]** functions in Menu, the following are side-key functions:
 1. Off: press defined key, and nothing happen.
 2. Monitor: to monitor the signal of working frequency and ignore the TX/RX sub-tone setting, force to turn on squelch.
 3. Freq Detect: to detect frequencies and CTCSS of nearby radios.
 4. Repeat Mode: to switch working mode from talk around mode (TX and RX at the same frequency, and the icon ④ shows up as RR) to reverse frequency (reverse TX/RX frequencies, and the icon ④ shows up as TX).
 5. Preset CH: to fast switching from current channel to preset shortcut channels. Shortcut channels are set by software.
 6. Local Alarm: to give out emergency alarm and report to surroundings at this same time.
 7. Remote Alarm: to give out emergency alarm and transmit the alarm via main working frequency.
 8. NOAA CH: to enter/exit NOAA weather report channels.
 9. Send Tone: to transmit a fixed frequency Tone via main working mode. The Tone is set by software.
 10. Roger Beep: to change end tones.
 11. GPS: to enter/exit GPS status.

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Radio Keys	Hand-MIC keys	Function Description
[F]		Short-press: switch from channel mode to frequency mode
[P1] [P2] [P3]		Definable keys
	[F]	Short press to input digit 1 Long press to into or exit TX frequency input mode, to set repeater frequency DTMF Code: 1 Character input: ASCII code (symbol, digit, letter)
	[F]	Short press to input digit 2 Long press to switch from priority TX to edit or busy DTMF Code: 2 Character input: ABC, abc

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Radio Keys	Hand-MIC keys	Function Description
	[F]	Short press to input digit 3 Long press to turn on/off VOX DTMF Code: 3 Input: DEFdef
	[F]	Short press to input digit 4 Long press to switch high/low power and DTMF Code: 4 Input: GHgh
	[F]	Short press to input digit 5 Long press to shift to squelch levels DTMF Code: 5 Input: JKJk
	[F]	Short press to input digit 6 Long press to turn on/off dual-band standby DTMF Code: 6 Input: MNOn

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4.12.2 Inputting of Digit/Symbol/English Letter
 When in Personal ID or CH Name status, input numeric keys directly to finish the numeric inputting.
 Press **[F]** button to input English letter, press relative keys to complete the inputting. Steps to input characters:
 1. Press **[F]** key to start inputting
 2. Press **[F]** key to open ASCII code table (the table consists of digits/symbols/English letters, and the initial character is blank character)
 3. Press **[▲]** or **[▼]** key to find the needed characters.
 4. Press the digit key which holds the characters to complete the inputting.
 The match-up relationship of digit keys and letters
[1] Character [2] ABC [3] DEF [4] GHI [5] JKL [6] MNOP [7] PQRS [8] TUV [9] WXYZ

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part. When the GPS of receiving is turned on and set successfully, the receiving radio will show up the orientation and distance of transmitting radio. While the GPS of receiving is turned off or set unsuccessfully, the receiving radio will show up the longitude and latitude of transmitting radio.

4.12 Inputting Method
 You can change relative characters via inputting method both in Menu list Personal ID and Menu list CH Name.

4.12.1 Delete Character
 When in Personal ID, the display content will be added blank characters automatically to 16 bytes (2 bytes per Chinese character, 1 byte per Digit/English letter/symbol), while in Channel Name, the display content will be added blank characters automatically to 10 bytes. You can move the cursor via **[▲]** or **[▼]** to certain place, then press **[F]** to delete the characters before it.

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Radio Keys	Hand-MIC keys	Function Description
	[F]	Short press to input digit 7 Long press to turn on/off the backlight DTMF Code: 7 Input: PQRS p q r s
	[F]	Short press to input digit 8 Long press to frequency step list DTMF Code: 8 Input: TUV t u v
	[F]	Short press to input digit 9 Long press to turn on/off key tone DTMF Code: 9 Input: WXYZ w x y z
	[F]	Short press to input digit 0 DTMF Code: 0 Input: space key

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Radio Keys	Hand-MIC keys	Function Description
	[F]	Short press to switch from channel report method to channel name report or channel number report Long press to enter/exit FM radio DTMF Code: * Input: Delete character
	[F]	Short press to switch channel mode to frequency mode Long press to turn on scanning DTMF Code: # Input: turn on/off character inputting

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4.11 GPS (Optional)
 While turn on GPS, the icon ⑦ shows up and the GPS activates.
 Define **[P1]** / **[P2]** / **[P3]** as GPS, and press the button under standby interface, then enter into GPS interface, which will show current longitude, latitude, height and the number of effective satellites. When the device begins to detect and decoding. This function cannot detect CTCSS of anti-decoded radios. Press **[PTT]** button to exit.
 If the frequencies are changing constantly before detecting activates, which means the nearby electromagnetic environment is complicated, in order to avoid strong electromagnetic interference, please choose proper detecting place. After detecting is done, press **[MENU]** to save the detected frequency and CTCSS/DCS to current channel, and press **[PTT]** to exit, press **[EXIT]** to re-detect. If detecting result is standard CTCSS/DCS, it will show up as standard

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CTCSS/DCS. If the result is non-standard CTCSS/DCS, it will show up as "23b" or "24b" plus a series of digits. After saving, if you want to check the result, please check Menu List Mute Code.
 Short press **[F]** to change the detecting frequency band range.
4.9 FM function
 Long press **[F/FM]** to enter into FM radio mode. Long press **[▲]** / **[▼]** to search for signals, or input frequencies manually via keypad. And short press **[▲]** / **[▼]** to stop scanning.
 If you want to receive signals while under FM radio mode, please enter into MENU list FM Standby, and turn it on.
4.10 NOAA
[P1] / [P2] / [P3] key is set to NOAA CH and press the side-key to NOAA weather report channels under standby status. Press **[▲]** / **[▼]** to switch NOAA channels. If not to operate for 2 seconds, the device will scan NOAA channels automatically.
 NOAA function is available in countries and areas that are supported only. The followings are 11 NOAA working frequencies.

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Radio Keys	Hand-MIC keys	Function Description
	[PTT-1]	Main PTT, press this button to transmit signals of the main working frequency
	[PTT-2]	Sub-PTT, press this button to transmit signals by B band frequency

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四、 Functions and Operations
4.1 Transmitting Signal
 Press **[PTT-1]** or **[PTT-2]** to transmit signals, icon ⑧ turns red and hand-mic light turns green.
 Press **[PTT-1]** to transmit main working frequency signals, press **[PTT-2]** to transmit B-band frequency signals.
4.2 Receiving Signal
 When the device receives the same signal with current working frequency, and the CTCSS/DCS matches, the radio will receive and send out the voice, and the icon ⑧ turns blue. If A band receives signals, hand-mic light turns blue.
4.3 Working Mode Switching
 Short press **[F]** button to switch the working mode to VFO frequency mode or Channel mode. When it is changed to VFO frequency mode, the icon ⑧ will show up as VHF. When it is changed to channel mode, the icon ⑧ will show up as channel number.
4.4 Display Mode Switching
 Short press **[F]** key to turn on/off dual-band display. When turn off dual-band display, the sub-frequency area will show up as system time.
4.5 Frequency Changing and Repeater Frequency Setting
 While under VFO mode, input frequencies manually via keypad, input 6 digits, the inputting is done. After this the input frequencies will be set to receiving and transmitting frequencies.
 If need to use repeater to relay the signals, set the TX frequency according to the repeater frequency table. Operation: Under VFO mode, long press **[F]** button, the frequency turns red, the input function activates, and input 6 digits, so the inputting is done automatically. The input frequencies will be set to TX frequencies. Long press **[F]** to exit TX frequency setting. Once the inputting is done, please enter MENU list Save CH to save frequency to appointed channel.

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Short press **[▲]** / **[▼]** can switch preset working frequencies. Long press **[▲]** / **[▼]** is fast switching function.
4.6 Channel Switching
 Under channel mode status, input channel number via keypads to switch to appointed channel directly. Short press **[▲]** / **[▼]** to switch to working channels one by one. Long press **[▲]** / **[▼]** is fast switching function.
4.7 Air Band Receiving
 When the working frequency is within 108-136 MHz, the device enters aviation frequency receiving mode.
 The device is not allowed to transmit signals under aviation frequency band status.
4.8 Frequency Detecting and Decoding (One-click Decoding)
[P1] / [P2] / [P3] is set to Freq Detect, and press these definable buttons while it is under standby status. Then the device begins to detecting and decoding. This function cannot detect CTCSS of anti-decoded radios. Press **[PTT]** button to exit.
 If the frequencies are changing constantly before detecting activates, which means the nearby electromagnetic environment is complicated, in order to avoid strong electromagnetic interference, please choose proper detecting place. After detecting is done, press **[MENU]** to save the detected frequency and CTCSS/DCS to current channel, and press **[PTT]** to exit, press **[EXIT]** to re-detect. If detecting result is standard CTCSS/DCS, it will show up as standard

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