User Manual

Welcome to use our Amateur radio

1. Precautions

Please observe the following precautions when using this product to avoid fire, personal injury, damage to equipment or other accidents:

①Do not use the equipment in inflammable and explosive environment (such as gas, dust, smoke,etc.), please turn off the equipment when refueling or parking at the gas station.

②Do not place the equipment in dusty, wet or splashed places or on uneven surfaces.

③Please use this equipment away from interference sources (such as TV, computer, distribution cabinet, etc.).

④Do not transmit while charging.

⑤Do not use radio while driving.

⑥Do not expose the device to direct sunlight for a long time or place it near the heating device.

⑦If the equipment emits abnormal odor, it must be turned off immediately. After ensuring safety, it should be sent to the nearest maintenance site for inspection.

⑧Do not modify or adjust this equipment for any reason.

⑨Please obey the local laws and regulations.

Disclaimer: The customer shall bear all the responsibility for the equipment failure or accident caused by the customer's violation of the above precautions, and the company shall not be responsible for it.

2.2. Product Checking

Thanks for choosing our Amateur 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.

Note: Public can not use this Amateur device.

NO	Item	Quantity
1	amateur Radio	1
2	Antenna	3
3	Li-ion Battery	1
4	Charger	1
5	Belt Clip	1
6	User Manual	1
7	Guarantee Card	1

3.Familiar with Radio

3.1 Radio Diagram

⑦ Antenna ②PTT ③Side-key 1 ④Side-key 2 ⑤Battery ⑥Short/Medium/Long Wave FM Antenna

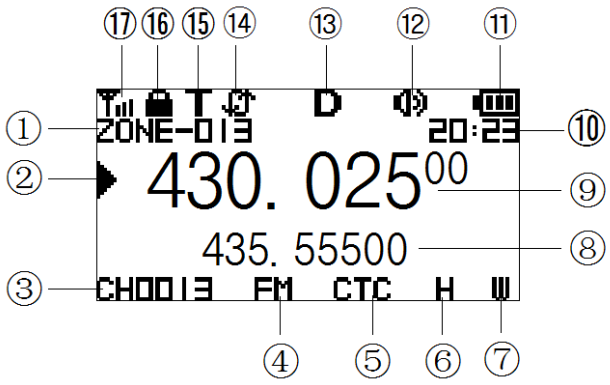
⑦ON/OFF/Volume Knob ⑧Indicator ⑨Alarm Button ⑩Speaker ⑪MIC ⑫Display Screen ⑬Keypad

⑭Earpiece and Programmable Jack ⑮Type-C Charging Port

3.2 Keypads Instruction

Keys	Function Descriptions
PTT	Transmit or Exit
Alarm Key	Definable long press and short press functions
Side-key 1	Can be selected as secondary PTT via Menu, and definable function is not available.
	Definable long press and short press functions
Side-key 2	Definable long press and short press functions
	DTMF : A
○	Short press to confirm or enter into menu
	Long press to enter DTMF inputting while under standby status, or to exit while under menu interface
	DTMF : C
▲	Switch upwards
	DTMF : B
▼	Switch downwards
	DTMF : D
0	Short press:input number 0
	Long press:definable functions
	DTMF: 0
	To input Number 0 or Space Bar
1	Short press to input Number 1
	Long press to definable functions
	DTMF: 1
	to input Number 1/English Letters/Chinese Characters
2-9	short press to input Number 2-9
	Long press to definable functions
	DTMF: 2-9
	to input Number2-9/English Letters/Chinese Pinyin Codes
*	short press to switch from channel frequency /channel number/channel Alias
	long press to lock the keypad
	DTMF: *
	To Delete
#	Switch working mode from VFO frequency mode/channel mode/zone mode
	DTMF: #
	to active inputting status and switch input methods

3.3 LCD Icon Display



① VFO MODE /CH MODE /ZONE-XXX Mode, XXX means current working zone

② Main frequency icon ③ Channel number

③ AM or FM Analog RX modulation

⑤ CTC analog channel with sub-tones/DCS analog channel with digital sub-tones/ENC analog channel with encrypted sub-tone/MUT analog channel with decoded sub-tone

⑥ Power ⑦W/N Wide/Narrow Band ⑧Sub-display information ⑨Main Display information ⑩System Time ⑪Battery Power

⑫Beep ⑬Dual standby ⑭Scanning ⑮R-Talk around /T-Freq Inverse ⑯Keypad Lock ⑰Signal Icon

4 Function Description

4.1 Input Frequency

① switch working mode to VFO frequency mode by pressing # key

② Input frequency via number keys, input 6 or 8 digits and the inputting done, via menu【Radio Set】->【 6or8 Bits Input】to set the inputting digits.

4.2 Input Repeater Frequency

Method 1

① Enter into Menu 【Channel Set】->【Offset Freq】 to input frequency difference via number keypads.

② Enter into Menu 【Channel Set】->【Offset DIR】to set frequency upwards and downwards.

Method 2

Long press # button to enter into 【TX Frequency】and imput TX frequency, press ○ to confirm then go back to previous menu. Press ▲ to set CTCSS/DCS.

4.3 Transmitting

①Press PTT and will transmit at current frequency, and the indicator lights up red at the same time.

② Press Menu 【Radio Set】->【Main PTT TX】 and set up as 【Area A】, press PTT button and transmit at A frequency always. If set up as 【Main Area】,it will transmit at main frequency all the time.

③ Turn on 【Key Define】->【Slaver PTT】,then the shortcut function of side-key 1 is invalid, press side-key 1 to transmit at B frequency.

4.4 Receiving

The indicator lights up green while receiving. If there is no RX sub-tone, or the sub-tone matches ,the speaker works.

4.5 DTMF

4.5.1 DTMF Inputting and Sending

① press ○ to enter into DTMF inputting interface while under standby status.

② Press numeric keys to input DTMF codes, press * to delete the last code (short press side-key 1 to delete when it doesn’t use as second PTT);

③ Press PTT to call, the device will send DTMF code to receiver after appointed delay time

4.5.2 While the device enter into receiving status, the display will show up the sender’s DTMF code if turn on DTMF decoding.

4.5.3 Press keypads to send relative DTMF code while under analog transmitting status.

4.5.4 DTMF Remote Monitor

① Set up a DTMF Monitor code and turn on 【DTMF Control】

② other radios send DTMF code with same monitor code to this radio.

③ After decoding successfully the radio will transmit for 60 seconds automatically to make remote monitor happen.

4.5.5 DTMF Stun/Kill/Activate

① set up a DTMF code for Stun/Kill/Activate, and turn on 【DTMF Control】

② Other radios will do Stun/Kill/Activate to this radio when they send relative DTMF code.

The radio cannot be use until receive activate code once it is in Kill status. The radio can receiving,but cannot input anything via keypad or transmitting once it is in Stun status.

Note:should set up Activate code once Stun/Kill code is set up, or the device cannot be activated.

4.6 Text Input

4.6.1 Press # to switch inputting methods, press * to delete inputting when under text input status.

4.6.2 Press number keys 【123】 to input numbers

4.6.3 English Letters Inputting 【AB】【abc】

① Number 2-9 can input relative English letters, press Number 0 to input space, Number 1 to input English symbols.

② Press same button to switch to different letters.

4.7 Function of Definable keys

【Monitor】 Enter into receiving and playing status once trigger this key.

【H/L Power】To switch high/low power of current channel.

【Dual Standby】 To turn on/off dual standby. The power saving mode is invalid once the dual standby turns on.

【TX Priority】 To switch priority RX to 【Edit】or【Busy】. Once set up to busy status, the main frequency will shift to the calling frequency automatically when the calling ends.

【Scanning】Press this button to enter into scanning status, and press arbitrary keys to exit.

【Backlight On-off】Press to turn on/off backlight.

【Roger Beep】 To switch the RX end tone types.

【FM Radio】

①press button to enter into FM status, press PTT to exit.

②Press # button to switch FM modulations, there are four types to switch from : USW(Ultra Short

Wave:64-108MHz)/SW（Short Wave: 2.3-26.1MHz）/MW（Medium Wave: 520-1710KHz）/LW（Long Wave: 153-279KHz）.

③Press # button to switch from FM modulation types. USW is fixed to FM modulation and cannot change. Other wave bands can switch to AM/USB/LSB/CW.

④Press * to switch inputting methods, when ▸ shows to FM frequency, can input frequency value manually. Press * button to switch to relative data, press ▲/▼ to switch data value(input channel value to switch channel number directly)

Note: when use single side band (USD/LSB) modulation, if there is sharp sound, turn down BFO value. If there is deep sound, turn up BFO value.

【Talk around】To switch repeater frequency to Talk-Around or Frequency Reverse. To transmit at RX frequency under Talk-Around status. To interchange frequency of RX and TX under frequency reverse mode.

【Emergency Alarm】Press the button to enter into emergency alarm status and make an alarm sound, press arbitrary keys to exit.

【Freq Detect】【CTC/DCS Scan】

①Press this button to enter into frequency detecting or remote sub-tone decoding mode, and the device will scan the RX signal nearby.

②Press 0 button to switch from frequency detecting to remote sub-tone decoding.

③Press * or PTT to exit during frequency detecting, press # to switch detecting bands.

④ Press * to re-detect after detecting done. Press ○ to save detecting results to VFO channels, and return to VFO standby mode. Press PTT to transmit signals.

【Send Single Tone】 Press this button to transmit a single frequency signal at current frequency.

【Status Query】Press this button to check time, battery power etc.

【Modulation Switching】 Switch current channel to AM/FM modulation. AM modulation is used for receiving air-band signals.

【Spectrum Mode】

② press this button to enter into spectrum scanning mode, press * button to exit;

② Press # button to enter into inputting status, there are 3 inputting items, central frequency is at upper-left, SPA means step space which is frequency spacing of adjacent waves, the unit is KHZ. DEC means amplitude attenuation, and the whole spectrum height drops so that to investigate the difference between main signal and adjacent signal;

③Press ▲/▼ to switch the cursor position. The cursor is at the bottom of the display. It will shows the frequency value of the cursor position at the left bottom while moving the cursor. The 3 data on left means the signal index, RSI is signal strength, NOI is signal noise strength, GLC is signal strength of adjacent channels.

【Squelch】press this button to shift to 【Squelch Level】to choose the squelch value.

【Freq Step】press this button to enter into 【Freq Step】to choose the value.

【Save Channel】press this button to save channel data.【VOX】press this button to turn ON/OFF VOX.

【Deep Sleep】Press this button to enter into low energy consumption status, press this button again to activate or the shutdown timer exceeds the APO, the radio will turn on again. The system time doesn't have maintenance function, if want to keep the system time under shutdown status, please set up as Deep Sleep function to make the radio into dormancy status.

【NOAA Mode】press this button to enter into NOAA scanning mode,and switch NOAA channels via channel knob. The radio will start to scan NOAA automatically when not any operation for 6S. The followings are NOAA frequencies.

1	162.550	7	162.5250
2	162.400	8	161.650
3	162.475	9	161.775
4	162.425	10	161.750
5	162.450	11	162.000
6	162.500		

5. Menu Specifications

5.1 Radio Setting

【Name/Call Sign】To change the alias of this radio can set up as the owner's alias or calling number.

When set up as 【Send Radio Name】 in menu list 【Analog Set】->【TX End Tone】,the alias of this radio will be sent out to receiver’s after analog calling ends.

【Lock Timer】The keypad will lock automatically when there is not any operation of the radio within the appointed time while under standby status. Long press * button to unlock the keypad.

【Light Timer】To set up the shutdown time of backlight. Set up as 【Off】then the radio will turn off the timer, the backlight no longer turn off automatically.

【Menu Exit】The radio will exit menu interface automatically once there is no any operation within appointed time.

【Save Mode】To save power consumption while set up the Power Saving function. But there is delay for RX omitting or missing messages under power saving status.

【Scan Mode】 Set up as 【CO】,the radio will resume scanning once the received signal ends. Set up as 【TO】, the radio will resume scanning after it receives signal and stay for a while. Set up as 【SE】,the radio stops scanning once it receives signals.

【Scan Direction】Scanning upwards and downwards.

【Scan Dwell】To set up the signal stay time while under 【TO】status.

【Scan Return】Set up as 【Original CH】 to return to original status after scanning done. Set up as 【Current CH】to stay at current channel after scanning done.

【Alarm Type】Set up as 【Local Alarm】to make an alarm sound once trigger alarm. Set up as 【Remote Alarm】to send alarm signals to remote radio and this radio doesn’t make any sound itself. Set up as 【Local + Remote】this radio makes an alarms sound and send alarm signals to remote radios while trigger this function.

【Main PTT TX】Set up as 【Area A】,press PTT to transmit at A band. Set up as 【Main Area】 , press PTT to transmit at main band.

【Dual Display】set up as 【Single】,the screen will show up one channel(frequency value or channel number), and the channel name will show up at the same time.

【Save CH】 Copy current channel to appointed channel and save it .

【Delete CH】Delete the data of selected channel.

【LCD Contrast】 The higher the value, the deeper the contrast. And need to restart the radio to

complete the setting.

【6 bits or 8 bits inputting】when set up as 6 bits, input 6 bits the frequency inputting is done. When set up as 8 bits, needs 8 bits to finish frequency inputting.

【Initialization】The frequency data will return to the last programming status.

5.2 Definable Key

【Slaver PTT】 Set up as 【On】and the side-key 1 will be the secondary PTT. The preset functions will be invalid when press side-key 1 to transmit at B band.

5.3 Analog Communication Setting

【SQ Level】The higher the value, the more difficult to turn on receiving.

【Tone Freq】 To set up single tone frequency of definable function 【Send Tone】.

【MIC Gain】To adjust the MIC receiving sensibility. The higher the value , the more sensibility the MIC.

【SPK Gain】To adjust the speaker’s volume. The higher the value,the louder the speaker. To avoid audio distortion,please don’t turn up the speaker highly.

【AM DAC Gain】 while receives air-band frequency, if gets stronger signal,due to the larger AM signal that causes audio distortion, can turn down DAC gain to get clear signals.

【DTMF Delay】 If DTMF tone is needed, it will be sent out at appointed time.

【DTMF Interval】 To set up the interval of two DTMF codes.

【DTMF Duration】To set up the lasting time of individual DTMF code.

【DTMF Mode】To set up sending time of DTMF code. The radio will not send DTMF code while transmitting, when the radio set up as 【Off】.

【DTMF Select】To send one of 16 preset DTMF codes while transmitting.

【DTMF Display】The received DTMF code will show up on the display once the radio set up as 【On】.

【DTMF TX Gain】【DTMF RX TH】There are difficulties while decoding DTMF codes of different brands radios. By adjusting the value of these two options,the DTMF codes of different brand radios can be compatible. Encode gain 64 and decode threshold 24 are recommended.

【DTMF Control】Other radios can take charge of this radio by sending same DTMF code of monitor/Stun/Kill/Activate, when the radio set up as 【On】.

【RSSI Refresh】To change the refresh interval of the RX field. While under weak signal status, the refresh speed is too fast, which will cause interference sound. Then please turn up the refresh interval.

5.4 Channel Setting

【CTC/DCS】【RX CTC/DCS】【TX CTC/DCS】 To set up sub-tone of current channel. To switch the types via * key.

【Set TX Freq 】 to set TX frequency value while need to set repeater frequency and no need to set 【Freq Step】 and【Freq Direction】

【DCS Encrypt】 choose【Encrypt 1/2/3】to encrypt standard DCS and only available for DCS. Choose 【Mute Code】 then the preset DCS is invalid and use this 【Mute Code】to be current DCS.

【Mute Code】 via one-click privacy can detect non-standard DCS of other radios.

【Scan Add】 Set up as 【Remove】,the radio will not scan this channel while scanning.

【Offset Dir】 Set up 【Offset Freq】before setting up frequency direction. When selects【Upward】, the TX frequency = RX frequency + frequency difference. When selects【Downward】, the TX frequency = RX frequency - frequency difference

【Offset Freq】Set up frequency difference as 0, if need to turn off the frequency difference of current channel.

5.5 Zone Setting

It has 256 zones and can be editable. Press # key to select or cancel channels.

5.6 FM Radio

【RX Standby】 set up as【ON】, the radio can standby the calling signal of main channel while under FM radio status.

【Channel List】there are 128 preset FM radio channels, choose the needed channel and press ○ to confirm. Can enter into Edit Name , or set the needed channels to current FM channel. （this operation will turn on the FM radio automatically, and enter into FM radio interface, and channel information is editable under FM status）

5.7 Time Management

【APO】To 【On】or【Off】the auto shutdown function.

【APO Timer】If this function is activated and not do any actions on the radio , the radio will shutdown automatically when activate this function.

【AWU】 choose 【ON】/【OFF】to activation function automatically.

【AWU Timer】When the APO timer reaches the preset AWU timer, the radio stops dormancy and back to working status.

6. Switch on/off the Power

Rotate the “power/volume button” clockwise to switch on the power, and you will hear the “Beep”, the device will automatic broadcast the corresponding channel.

7. Adjust the Volume

Rotate the “power/volume button” clockwise to turn up the volume, Rotate the “power/volume button” counterclockwise to turn down the volume,

8. Installation of antenna

The supplied high gain antenna provides high performance at the entire VHF/UHF frequency range of the transceiver.

(1) To install the supplied antenna, hold the bottom of the antenna, and then screw it into the connector on the transceiver until it is snug.
Do not over-tighten by use of extreme force

(2) To uninstall the antenna, hold the bottom of it and turn it counterclockwise to remove it.
Note:
①|Never transmit without having an antenna connected.
② When installing the supplied antenna, never hold the upper part of the antenna while screwing it onto the connector on the transceiver. Or you will snap the antenna.

9. Scan Mode

(1) Enter Menu ->Key Define, select a key for the device, and set the function of the key to "Scanning".
(2) Return to the standby interface and trigger this key.If the device is currently in frequency mode, its operating frequency will cycle up or down in the set step and direction. If the device is currently in channel mode, its working channel will cycle in the set direction to increase or decrease. The frequency step is set in Menu ->Basic Set ->Freq Step, and the scanning direction is set in Menu ->Basic Set ->Scan Direction

10. Specifications

General Part	
Frequency Range:	FM radio: FM: 64-108MHz SW: 2.3-26.1MHz MW : 520-1710KHz LW: 153-279KHz RX/ Scanning: 136-174MHz,350-390MHz, 400-520MHz TX:144-148MHz, 420-450MHz(Amateur Band)
Channel Capacity	1024 Channels +2*VFO channels
Channel Spacing（W/N）	Analog:25kHz/12.5kHz
Voltage	7.4V DC
Working Mode	Same frequency simplex,different frequency simplex
Antenna	Removable Antenna
Frequency Stability	±2.5ppm
Working Temperature	－20～ ＋60℃
Dimension	137 X 60 X 36about255g
Transmitting	
Modulation Mode	F3E
Maximum deviation（W/N）	≤5KHz /≤2.5KHz
SNR（W/N）	-45dB/ -40dB
TX Current	≤1500mA
Receiving	
Sensitivity（W/N）	0.22μV/ 0.25μV 12dB SINAD
Inter modulation（W/N)	65dB/ 60dB
Audio Distortion	＜5％
Audio Output Power	≤1W（16Ω）
RX Current	≤350mA
Standby Current	≤70mA

Note: The above parameters are subject to change without prior notice!

Company Name: Iradio Electronics Co., Ltd.
Address: No.16 Daxiamei Industrial Area, Nan'an, Quanzhou City, China

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (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 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.

SAR tests are conducted using standard operating positions accepted by FCC with the device transmitting at its highest certified power level in all tested frequency bands, although the SAR is determined at the highest certified power level, the actual SAR level of the device while operating can be well below the maximum value. Before a new model is a available for sale to the Population/Uncontrolled it must be tested and certified to the FCC that is does not exceed the exposure limit established by the FCC. Tests for each product are performed in positions and locations as required by the FCC.

For body worn operation, this device has been tested and meets the FCC RF exposure guidelines when used with and accessory designated for this product or when used with and accessory that contains no metal. To maintain compliance with FCC RF exposure guidelines hold the transmitter and antenna at least 1 inch (2.5 centimeters) from your face and speak in a normal voice, with the antenna pointed up and away from the face.

The equipment complies with FCC radiation exposure limits set forth for and uncontrolled environment. In order to comply with the FCC RF exposure requirement, the antenna installation must comply with following:

Users must be fully aware of the hazards of the exposure and able to exercise control over their RF exposure to qualify for the higher exposure limits.

Your wireless hand-held portable transceiver contains a low power transmitter. This product sends out radio frequency (RF) signals when the Push-to-Talk(PTT) button is pressed.

The device is authorized to operate at a duty factor not to exceed 50%.