DMR-5R Wireless Digital Two-way Radio

Operating Instructions

Dear Customers

Thank you for choosing BAOFENG two-way radio.

BAOFENG always provides customers with wireless communication products of true high performance and high stability, and this two-way radio is with no exception. DM-5R is an all-weather digital two-way radio with 128 channels, lattice LCD, Chinese and English voice operation prompt and full keyboard manual adjustment function developed and produced by BAOFENG team for its penetrating into civil consumption market. Please read this instruction carefully to get a full understanding of various superior performance, operation and maintenance method of this two-way radio.

■Functions

Characterized by attractive appearance, solidness, durability, loud voice, excellent performance, perfection and value, this two-way radio is an all-weather digital two-way radio with 128 channels, lattice LCD display, Chinese and English voice operation prompts and full keyboard manual adjustment function. Besides, it also has following functions:

- Compatibility of digital and analog under DMR system; lattice LCD display provided with Chinese and English voice prompts; friendly interface
- Digital talkback function: support individual call, group call and all call and support digital voice encryption
- Support relevant application of relay in digital mode
- Support two-way radio detection in digital mode
- Support emergency alarm in digital mode
- Dual-stage, dual-display and dual-frequency waiting, relay cross-stage receiving and transmitting in U/V stage, easy networking for users
- Frequency range: VHF130-176MHz & UHF400-520MHz
- Switching between high power and low power to meet the power requirement of users for different communication distances and to achieve better energy and power saving
- Up to 128 memory channels available for the programming of frequency and other various data
- Display of channel number, frequency, channel frequency and channel name, etc.
- Different CTCSS/DCS and DTMF signaling can be set for each channel so as to reject surplus calls from other radio stations
- Tail tone elimination avoiding the impact noise made by the speaker after the call to protect users from such noise impact.
- VOX allowing users to operate the two-way radio without using hands and to have a normal conversation without pressing the PTT key.
- Emergency alarm and ANI identification through DTMF
- DTMF, CTCSS (60.0 -259.9 HZ) and DCS signaling coding and decoding function
- 8-level stepped frequency selection (2.5K, 5.0K, 6.25K, 10.0K, 12.5K, 20.0K, 25.0K and 50.0K)
- Provided with intermediate pilot frequency and reverse frequency function which allows it to adapt to the setting requirements

under various complex conditions

- Auto power saving function. Reduce power consumption so as to extend the operation time of the two-way radio.
- Emergency call and sound and light alarm function
- Computer programming (read-write frequency and function setting) function
- Broad/narrow band (25KHz/12.5KHz) selection function
- Digital tunable FM radio (receiving frequency: 65-108MHz)
- Direct selection of menu items with numeric characters on the keyboard. The transmitting and receiving frequency can be entered directly.
- Bright flashlight lighting function
- Battery voltage display function

■ User safety information

Please read the following information for your safe and efficient operation of this two-way radio.

1. Maintenance of this two-way radio can be done only by professionals. Please don't disassemble it by yourself;
2. To avoid problems caused by electromagnetic interference and/or electromagnetic compatibility, please turn off the two-way radio at places with the "please turn off the two-way radio" sign, such as hospital and other health care and medical treatment places.
3. Please turn off the two-way radio when you are on a flight if so required by crew members.
4. In a car with airbag, don't place the two-way radio in an area where the airbag may stretch when it is deployed.
5. Please turn off the two-way radio before you enter into an inflammable and explosive environment;
6. Don't replace or charge the battery in an inflammable and explosive environment;
7. Please turn off the two-way radio before you come close to blast zone and areas where a detonator is arranged;
8. Don't use the two-way radio after its antenna is broken since slight burn may be caused when the broken antenna is brought into contact with the skin.
9. Don't expose the two-way radio to direct sunlight for a long time or place it near a heating device.
10. When a portable two-way radio is transmitting signal, place it vertically, and keep the microphone about 5cm away from mouth.
11. When transmitting signal, keep the antenna of the two-way radio 2.5cm at least away from head or body.
12. If you wear the portable two-way radio, it should be confirmed that when the two-way radio is transmitting signal, its antenna is kept 2.5cm at least away from body.

■ Product check

Welcome to use BAOFENG wireless digital two-way radio DMR-5R. Before use, it is suggested that you should:

1. First check whether the packing box of this product shows sign of damage;
2. Open the packing box carefully and confirm if it contains items listed in the table below; Please contact the dealer immediately if you find this product or any accessory is lost or damaged during handling.

List of accessories

Items	Quantity
Antenna	1
Belt clip	1
Handbag	1
Battery	1

Intelligent seat type charger	1
Power adaptor	1
Operating instructions	1
Product certificate	1

■Battery information

- Use the battery for the first time

Please charge the new battery before use since it wasn't fully charged when delivery. Generally, when the battery is used for the first time, it shall be charged for 4 hours. For lithium ion battery, no matter it is charged with slow charger or rapid charger, the charging time above shall be followed. It is suggested that the charging method above shall be followed when the new battery is charged for first three times. When the battery runs low, it shall be charged.

- Suitable type of battery

Please charge the battery specified by BAOFENG; an explosion may occur to cause personal injury if other batteries are used.

- Safety considerations in use of battery

1. Don't bring battery contacts or poles into contact with metal objects (including coin, key, jewelry or other conductive metal) , otherwise, short circuit, discharging, heating or leakage may occur to cause item damage or personal injury. Therefore, care must be exercised for battery disposal.
2. Don't cause short circuit of battery terminals or discard the battery into fire. Don't disassemble the shell of the battery pack by yourself. Please put the discarded battery into dedicated battery recycling bins.

- Instructions of normal operation of battery

★ Please charge the battery indoors and best charging effect shall be attained at room temperature.

★ In general, the battery is fully charged when the indicator of the charger turns from red light to green light. Now, the battery shall be taken out.

★ The battery may be charged on the two-way radio, but preferably the two-way radio shall be turned off when charging to ensure that the battery is fully charged.

★ Don't charge the battery when its power hasn't been exhausted as this will shorten the service life of the battery (When the power is exhausted, the two-way radio will send out voice warning).

★ Don't place the battery fully charged back to the charger for "recharging" since this operation will significantly reduce the cycle service life of the battery.

- Extend the service life of the battery

★ Battery performance will decrease at temperature below -20℃. Please prepare spare battery in cold weather. Don't discard cooled batteries which fail to work. They may work at room temperature.

★ Dust deposited on battery contacts may affect the service life of the battery. Please wipe the contacts with a clean dry cloth before the battery is loaded on the two-way radio.

- Battery storage notes

1. Since battery self-discharge may occur, if the battery will not be used for a long time, please fully charge it before storage to avoid damage to the battery due to over-discharge.
2. Please take out the battery from storage and recharge it 6 months after it is put into storage to avoid that over-discharge of electrolyte affect battery capacity.
3. Attention shall be paid to the temperature and humidity in battery storage environment. Please store the battery in cool and dry conditions at room temperature to reduce battery self-discharge.

- Instructions of charging process of the charger

If the red indicator of the two-way radio flashes after the battery is loaded and prompts "low battery" every 30 seconds, please charge the battery.

Please charge the battery with BAOFENG-specified charger; the indicator of the charger indicates the charging condition.

Display of the indicator	State
Red light flashes	Low battery voltage
Red light is on	In charging process
Green light is on	Charging completed

- Charging shall be done as follows:

1. Insert the power cord into power adapter;
2. Insert the DC plug on the power adaptor into the DC jack on the back of the charger;
3. Insert the battery or the two-way radio with battery on the charger;
4. Insert the AC plug of the power adaptor on the output socket of AC power supply.
5. Confirm that the battery is brought into contact with the charge terminal. When the indicator turns red, charging begins.
6. After the battery being charged for about 4 hours, the indicator turns green, representing that the charging is completed. Now, the battery or the two-way radio with the battery can be taken out.

Note: Make sure that this product is turned off during charging. The red light may flash continuously when the battery is put into the charger. This is the pre-charge process of the charger for protecting the battery when the battery power is low. It is a normal phenomenon which usually lasts for 30 seconds. Then the red light is on and the battery enters into normal charging state.

■Accessory installation

1．Battery installation/removal

- Battery installation

  Align the battery with the battery installing seat on the back of the two-way radio. Press the battery into the two-way radio forcefully, slide the battery upward until the locking plate is locked in a proper position. (As shown in Figure 1-1)

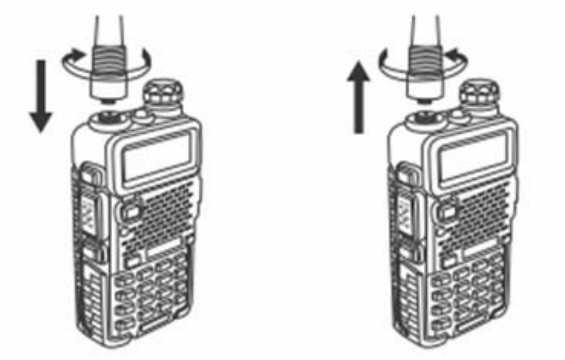
- Battery removal

  Turn off the two-way radio before removing the battery. Move the battery lock to unlocking position and press it, then slide the battery downward until it is taken out of the battery installing seat. (As shown in Figure 1-2)

2．Antenna installation/removal

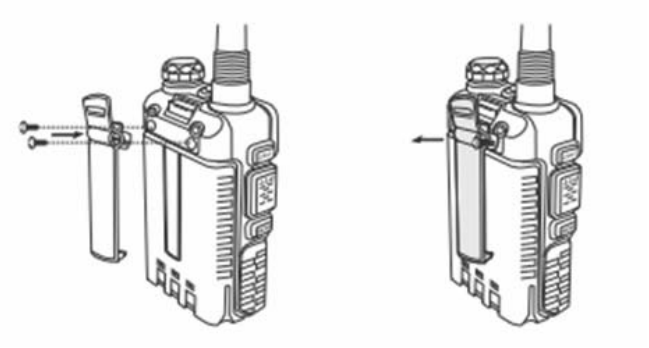
Turn off the two-way radio, insert the antenna into the mounting hole and rotate it clockwise. (As shown in Figure 2-1)

For antenna removal, rotate the antenna anticlockwise and remove it. (As shown in Figure 2-2)



3. Belt clip installation/removal

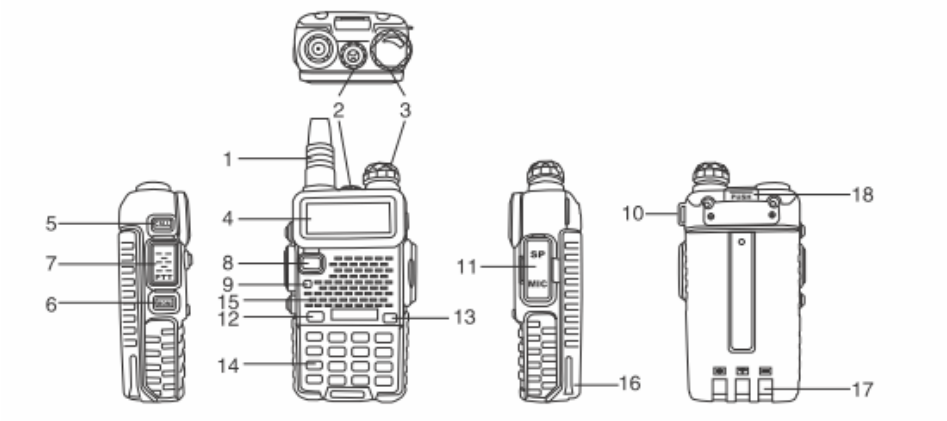
- Remove the two screws of the battery. Align the two screw holes of the belt clip with screw holes at the top of the battery, install the belt clip and tighten the screws (As shown in Figure 3)
- Loosen the screws and remove them from the belt clip (It is suggested that you install the screws on the battery for the convenience of next installation and use of the belt clip).



4. Installation of external headphone/microphone (Optional accessories shall be purchased separately)

Open the headphone cover and insert the headphone plug into the headphone jack. When the headphone isn't used, remove the headphone plug from the headphone jack and close it with the headphone cover. When the general interface isn't used, please close it with the dust cover. (As shown in Figure 4)

■Have an intimate knowledge of this two-way radio (illustration)



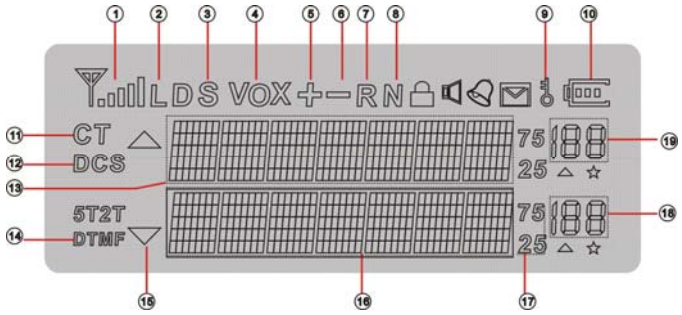
Antenna	Helical antenna with screwed plug for receiving and transmitting signals.
Bright flashlight	
[Power on/off/volume control] button] button	Turn on two-way radio power supply or increase the volume gradually by rotating this button clockwise; Turn off two-way radio power supply or reduce the volume gradually by rotating this button anticlockwise
LCD	Lattice LCD
【CALL】key	Activate the radio function (Enter radio frequency by keyboard or search radio station automatically by #SCAN) by pressing this key; deactivate the radio function by pressing this key again. In analog mode, activate the alarm function by long pressing this key, now the green indicator, red indicator and flashlight flash simultaneously; remove the alarm by pressing this key again. In digital mode, activate the alarm function by long pressing this key; remove the alarm by pressing this key again.
【MONI】key	Activate the flashlight function by pressing this key, and now the flashlight is on; make the flashlight flashing by pressing this key twice; deactivate the flashlight function by pressing this key again. In analog mode, activate the monitoring function by pressing and holding this key for long time; deactivate the monitoring function by releasing this key. In digital mode, activate the two-way radio detection function of the two-way radio to detect whether the other party is online.
【PTT】transmitting key	After pressing this key, the two-way radio enters transmitting state; call the other party by speaking to the microphone. After releasing this key, the two-way radio enters receiving state.
【VFO/MR】Key	Frequency mode or channel mode switching key
Transmitting/receiving state light	The red light is on when the two-way radio is in transmitting state; the green light is on when the two-way radio is in receiving state.
String hole	Hang the string with this hole as necessary.
External interface	Used for external headphone; or when used for external frequency writing line, frequency writing operation and program upgrading can be completed with PC frequency writing software.
【A/B】key	In standby mode, switch A/B pointer by pressing this key;
【BAND】key	； Key for UHF/VHF frequency bank switching; in radio mode, switch 65-75/76-108MHz frequency band by pressing this key;
0-9 numeric keys	0 – 9 numeric keys for frequency, channel sequence number, menu item and menu value input. In menu setting mode, the menu item name behind each numeric key can be set by pressing the key directly.
Microphone	Voice input; keep the microphone about 3~5 cm away from the mouth when transmitting.
Battery pack	Supply power for the two-way radio.
Battery charging contacts	Contact piece between the battery and the charging dock. Don't bring battery

	contacts or poles into contact with metal objects.
Battery push-button	Used for battery fixing.
Loudspeaker	Voice output.
Belt clip	Used for clipping the two-way radio on the belt for easy carrying.
【MENU】key	Press this key to enter menu setting mode; in menu mode, press this key to enter the current menu item.
【▲/▼】page up/page down key	In frequency mode, change the current receiving frequency up and down from the current set stepped frequency. In channel mode, select channel up and down. In menu mode, change the menu items and menu values to be set forward and backward; search forward and backward rapidly by long pressing this key for more than 2 seconds. In scanning mode, change the scanning direction.
【EXIT】key	In input mode, clear the information that has been input by pressing this key
【*/SCAN】key	Start the frequency or channel scanning by long pressing this key for more than 2 seconds; in FM radio mode, press this key to search FM radio station automatically;
【#/⊓○】key	Switch between high transmitting power and low transmitting power temporarily by pressing this key; lock or unlock the keyboard by pressing this key for more than 2 seconds.

Four kinds of relay audio frequency call signaling: Transmit 1,000HZ signaling by pressing 【PTT】+【CALL】keys; transmit 1,450HZ signaling by pressing 【PTT】+【VFO/MR】keys; transmit 1,750HZ signaling by pressing 【PTT】+【A/B】keys; transmit 2,100HZ signaling by pressing 【PTT】+【BAND】keys

LCD

During operation, corresponding function icon shall appear on the display screen. The display screen allows you to realize the meaning of the indicating icon and how to set function with it rapidly.



Interpretation of icons on the Liquid crystal display (LCD)

Number	Icon	Description
1		Channel intensity indication
2		Current transmitting power is low (Most power-saving, the distance is shorter) ; non-display of L represents high power transmitting
3		Represent that the voice-operated transmitting function has been activated; when the sound pressure level of the microphone reaches the set value, transmitting shall be activated.
4		The symbol appearing in frequency mode represents that, the receiving frequency is the transmitting frequency plus a frequency difference which is set in the frequency writing software.
5		This symbol appearing in frequency mode represents that, the receiving frequency is the transmitting frequency minus a frequency difference which is set in the frequency writing software.
6		Receiving frequency and transmitting frequency inversion in frequency mode/channel mode

7		This symbol appears when the channel operates in narrow band.
8		This symbol appears when the keyboard is in locking state. The keyboard can be unlocked by pressing #/LOCK key.
9		Display of current remaining battery power;  indicates that the battery is in full charge;  indicates the remaining battery power;  indicates that the battery is running out, now the outline of the icon flashes, and no transmitting shall be done.
10		This symbol indicates that current CTCSS is CTCSS. This signal appearing when transmitting represents that the CTCSS signaling is being transmitted.
11		This symbol indicates that current CTCSS is DCS. This signal appearing when transmitting represents that the DCS signaling is being transmitted.
12		Frequency A, channel display area; simple menu prompt and set parameter display in menu setting mode.
13		This symbol indicates that the DTMF signaling is activated.
14		Frequency A and Frequency B pointer
15		Frequency B, channel display area; simple menu prompt and set parameter display in menu setting mode.
16		Indication of stepped frequency mantissa (in KHZ)
17		Indicate channel sequence number in Segment B channel mode.
18		Indicate channel sequence number in Segment A channel mode; indicate menu sequence number in menu mode.
19	D	Display of D represents that current channel is digital channel; non-display of D represents that current channel is analog channel.

■Basic operation

◆Startup and shutdown

Rotate the [power on/off/volume control] button clockwise until you hear "click" sound, the two-way radio beeps twice loudly, now you can see that the full two-way radio screen lights up immediately and hear the voice prompt that current mode is channel (or frequency) mode. Then frequency and other designators are displayed.

△ Rotate the same button until you hear "click" sound to turn off the two-way radio.

 If the voice prompt function of the two-way radio is disabled, startup prompt tone will not be issued. Startup display mode setting is in Menu 38; it can be set as full screen lighting up (FULL) or model display (MGS).

◆Volume adjustment

After turning on the power supply, rotate the [power on/off/volume control] button clockwise to increase the volume gradually.

△ Rotate the same button anticlockwise to reduce the volume gradually until the power supply is turned off.

◆Talkback (transmitting and receiving)

◎Call transmitting: After selecting a proper channel (or entering your desired frequency), press [PTT] key, now the two-way radio is in transmitting state. Then speak to the microphone with a normal tone. You can switch the transmitting power according to actual need (power setting is in Menu 2):

·When transmitting by pressing [PTT] key, display of L at the top of the screen represents that the current transmitting power is low power.

·When transmitting by pressing [PTT] key, non-display of L at the top of the screen represents that the current transmitting power is

high power.

◎Call receiving: After the [PTT] key is released, the two-way radio enters receiving state.

When continuous transmitting time exceeds that specified in "Menu 9" (default 60 seconds) , the two-way radio stops transmitting (before transmitting is stopped, the internal time-out timer shall cause the transmitting indicator flashing 10 times in advance, and then voice prompt of "transmitting time out" is issued) . In this case, release the [PTT] key to stop the two-way radio for a while, then press the [PTT] key again to continue the call operation.

①To ensure that the two-way radio of the receiver receives the call in best volume, please keep the microphone about 3~5 cm away from the mouth when transmitting.

②Communication distance may be shortened in rainy day and in the woods.

◆Monitoring function (available for analog channel)

In standby mode, press [MONI] key to start monitoring. When squelch circuit is shut off, you will hear the background noise (the prompt tone sounds once); release the same key to stop monitoring, then you will not hear the background noise.

If it is needed to check whether channel interference exists, you can press this key and rotate the volume control knob, then you will hear the background noise or interference noise.

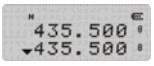
◆Intermediate pilot frequency transmitting (available for analog channel)

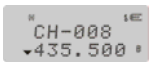
Transmit 1,750Hz tone pulse signal by pressing [PTT] key first and then pressing [A/B] key; Cancel the transmitting of 1,750Hz tone pulse signal by releasing [A/B] key.

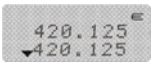
◆DTMF transmitting (available for analog channel)

Transmit corresponding DTMF number by pressing [PTT] key first and then pressing corresponding numeric key.

◆Frequency/channel mode switching

When the two-way radio is turned on and the keyboard is not locked, switch to channel mode by pressing [VFO/MR] key. 

or 

is displayed on the screen. Channel number displayed at the bottom right corner represents that the two-way radio currently is in channel mode. Increase or reduce the channel value by pressing [▲] key or [▼] key. Switch between frequency mode (VFO) and channel mode by repeating this operation. In frequency mode, 

is displayed on the screen.

◆Frequency selection

1） VFO mode (frequency mode)

VFO mode is the basic mode for operating frequency changing

Switch to VFO mode by pressing [VFO/MR] key, and increase or reduce the frequency by pressing [▲] key or [▼] key.

2） Enter the frequency directly

Besides pressing [▲] key or [▼] key, you can also enter the frequency directly. If the desired operating frequency is far from current frequency, the frequency can be entered directly through keyboard.

① Switch to VFO mode by pressing [VFO/MR] key.

·It's only the VFO mode that allows to enter the frequency directly.

② Enter the desired frequency by pressing the numeric keys ([0]~[9]) (three digits before the decimal point represents MHZ, and three digits after the decimal point represents KHZ)

◆Single waiting/dual-frequency waiting function switching (available for analog channel)

In double waiting mode, the two-way radio can receive the frequency set in Channel A or Channel B (achieve the receiving and communication in two frequencies, the UHF/UHF and VHF/VHF). Execute the operation steps below:

1) In analog channel, access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 7 directly) until the screen shows and the pointer points to TDR; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key until the pointer on the screen points to ON; then activate the dual-frequency waiting function by pressing [MENU] key.

·**or:** the pointer on the screen points to OFF; then deactivate the dual-frequency waiting function by pressing [MENU] key.

4) Return to the previous menu.

▲The dual-frequency waiting function can be activated only when both of Channel A and Channel B are analog channel. If one of them is digital channel, the function can't be activated. For digital channel, the sign ‘D’ displayed next to the signal strength sign represents that the current channel is digital channel.

◆VOX

After this function is activated, if the speech volume of the user reaches the level set for the two-way radio, the two-way radio can activate transmitting operation via voice without the [**PTT**] key being pressed. The function above may be activated in certain workplaces where the user's hands are too occupied to press [**PTT**] key. Execute the operation steps below:

1） Access to the menu by pressing [MENU] key.

2） Press [▲] key or [▼] key (or enter 4 directly) until the screen shows and the pointer points to VOX; then perform the selection operation by pressing [MENU] key.

3） Press [▲] key or [▼] key to change current setting according to the screen prompts, then press [MENU] key to select new voice control sensitivity (selection range is 1~10; the greater the value is, the higher the sensitivity is) .

·or: the pointer on the screen points to OFF; then deactivate the VOX function by pressing [MENU] key.

4) Return to the previous menu.

▲After the VOX function is activated, the voice can be transmitted by speaking to the microphone; the transmitting shall be stopped by stopping speaking. You can select VOX sensitivity level according to the quiet degree of service environment; in the environment where there are too much noises, long-time transmitting may occur after the VOX function is activated.

◆Key locking and unlocking

In order to prevent unintentional entering, you can lock the keys of the two-way radio. Execute the operation steps below:

1) Access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key until the screen shows and the pointer points to AUTOLK; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key until the pointer on the screen points to ON; then activate the automatic key locking function by pressing [MENU] key.

·**or:** the pointer on the screen points to OFF; then deactivate the automatic key locking function by pressing [MENU] key.

4) Return to the previous menu.

▲After the keyboard locking function is activated, when the keyboard is in unlocking state, the numerical keyboard shall lock automatically if no keyboard operation is conducted for a period of 8 seconds, and the screen shows icon. When the keybaord is in locking state, it can be unlocked by pressing [#/] key, and now the icon disappers. After the automatic keyboard locking function is activated, it can be used normally by pressing [PTT]+[MENU]，[PTT]+numeric key.

◆Activate or deactivate keyboard

You can activate and deactivate the keyboard sound as necessary. Execute the operation steps below:

1) Access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 8 directly) until the screen shows and the pointer points to BEEP; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key until the pointer on the screen points to ON; then activate the keyboard sound by pressing [MENU] key.

·**or:** the pointer on the screen points to OFF; then deactivate the keyboard sound by pressing [MENU] key.

4) Return to the previous menu.

◆Squelch level setting (available for analog channel)

You can adjust the squelch level of the two-way radio; screen out useless call with weak signal or channel the background noise is higher than common value. Execute the operation steps below:

1) Access to the menu by pressing [MENU] key.

2) The screen shows and the pointer points to SQL; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key to change current setting, then select new squelch level by pressing [MENU] key.

4) Return to the previous menu.

▲When the squelch level is set as o or too low, the two-way radio is easy to be interrupted by useless call with weak signal; when the squelch level is set too high, call from remote position may also be screened out.

◆High/low power setting

You can set the two-way radio power level of each channel as high or low. When it is set as HIGH, communication with two-way radio which is relatively far to this two-way radio can be achieved. When it is set as LOW, communication with two-way radio which

is relatively close to this two-way radio can be achieved. Execute the operation steps below:

1) Access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 2 directly) until the screen shows and the pointer points to TXP; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key until the pointer on the screen points to HIGH; then set the two-way radio as high power transmitting by pressing [MENU] key.

·**or:** the pointer on the screen points to LOW; then set the two-way radio as low power transmitting by pressing [MENU] key.

4) Return to the previous menu.

▲In high power state, switch to low power rapidly by pressing [#/🔒] key.

◆Automatic backlight function

You can select to activate or deactivate the keys and screen backlight of the two-way radio as necessary. Execute the operation steps below:

1) Access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 6 directly) until the screen shows and the pointer points to ABR; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key until the pointer on the screen points to ON; then activate the automatic backlight function by pressing [MENU] key.

·**or:** the pointer on the screen points to OFF; then deactivate the automatic backlight function by pressing [MENU] key.

4) Return to the previous menu.

▲If the automatic backlight function is deactivated, the screen backlight and keyboard backlight shall be deactivated automatically.

■Scanning function

Your two-way radio finds out whether there is voice activity in current channel/contacts group by scanning the channel/contacts group sequence in the list. Your two-way radio can support up to 128 scanning list. You can add or delete channels by editing the scanning lists with frequency writing software.

There are three optional scanning recovery modes for the two-way radio. Execute the operation steps below:

1) Access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 15 directly) until the screen shows and the pointer points to SC-REV; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key until the pointer on the screen points to TO; then set the scanning mode as time scanning mode by pressing [MENU] key, then continue the scanning 5 seconds after finding the signal.

·**or:** the pointer on the screen points to CO; then set the scanning mode as carrier scanning mode by pressing [MENU] key. Then continue the scanning after the signal that is found disappears.

·**or:** the pointer on the screen points to SE; then set the scanning mode as search scanning mode by pressing [MENU] key. Stop

scanning after finding the signal.

4) Return to the previous menu.

◆Start and stop scanning

Execute the operation steps below:

1) Start scanning by pressing [*SCAN] key.

·or: When scanning, your two-way radio stops in the channel/contacts group where activity is detected. The two-way radio stops in the channel for the preset time which is called "idle time". You can press the [PTT] key and then speak to the microphone clearly.

2) Answer it by releasing [PTT] key.

3) If you fail to make a response within the idle time, the two-way radio shall go back and scan other channels/contacts groups.

4) You can stop the scanning by pressing any key during scanning.

◆Channel deletion

You might want to delete certain storage channel due to setting error or changing other settings. Execute the operation steps below:

1) In analog channel, access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 24 directly) until the screen shows and the pointer points to DELCH; then perform the selection operation by pressing [MENU] key.

3） Press [▲] key or [▼] key to select forward or backward the channel to be deleted. If:

·The pointer on the screen pointing to where there is CH character prompt and channel number (such as CH-000) represents that the channel number has previously stored channel parameters and can be deleted.

·The pointer on the screen pointing to where there is channel number (such as 000) but there isn't CH character prompt represents that the channel number is blank, needn't be deleted, and can be stored directly.

4) Then delete the channel by pressing [MENU] key; return to the previous menu.

◆Channel storage

Parameters that should be contained in a complete channel include receiving frequency, transmitting frequency, receiving CTCSS, transmitting CTCSS, channel bandwidth, busy channel lockout, scan channel adding, and channel name, etc. Except that scan channel adding and channel name need to be edited with frequency writing software, all other parameters can be set in frequency mode and stored in specified channel number by Menu 23 channel storage. For example, it is required that the following channel storage parameters shall be stored in Channel Number 001.

① Receiving frequency 440.5 MHZ

② Transmitting frequency 430.5 MHZ

③ Receiving CTCSS number D031N

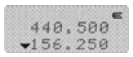
④ Transmitting CTCSS number D031N

⑤ Transmitting power high

⑥ Channel bandwidth wideband

⑦ Join scanning queue

Execute the operation steps below:

1) Select analog channel, switch to VFO mode by pressing [VFO/MR] key, 

is displayed on the screen.

2) In frequency mode, make A/B frequency pointer points to A (uplink frequency point) 

by pressing [A/B] key.

3) Make the two-way radio operate in UHF band by pressing [BAND] key.

4) Adjust the frequency to 440.500MHZ by pressing numeric keys 4,4,0,5,0,0 in turn, 

is displayed on the screen.

5) Power setting: Select power (HIGH/LOW) as HIGH by pressing [MENU] →2→ [MENU]→ [▲] or [▼], then return to the menu → [MENU],

6) Bandwidth setting: Select channel bandwidth (NARR/WIDE) as WIDE by pressing 5→ [MENU]→ [▲] or [▼], then return to the menu → [MENU],

7) DCS receiving setting: Select CTCSS value D031N by pressing 10→ [MENU] → [▲] or [▼], then return to the menu → [MENU],

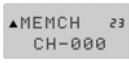
·After received DCS is set, the CTCSS receiving is turned off automatically; in the same way, after received CTCSS is set, the received DCS is turned off automatically. If it is needed to set CTCSS: Select CTCSS value by pressing [MENU] →11→[MENU] → [▲] or [▼],then return to the menu → [MENU],

8) DCS transmitting setting: Select CTCSS value D031N by pressing 12→ [MENU] → [▲] or [▼], then return to the menu → [MENU],

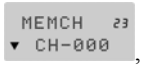
·After transmitted DCS is set, the transmitted CTCSS is turned off automatically; in the same way, after transmitted CTCSS is set, the DCS transmitting is turned off automatically. If it is needed to set CTCSS: Select CTCSS value by pressing [MENU] →13→[MENU] → [▲] or [▼],then return to the menu → [MENU],

·The CTCSS can be entered through keyboard directly in which case both of standard CTCSS and non-standard CTCSS can be selected, or set by [▲] or [▼] key in which case only standard CTCSS can be selected.

9) Storage setting for the receiving and transmitting of channels in the same frequency:

9.1) By pressing 23, the screen shows and the pointer points to MEMCH, the screen shows 

.

9.2) By pressing [MENU] key, voice prompt "store channel" is issued and the screen shows 

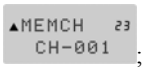
,

9.3) By pressing [▲] key or [▼] key, select forward or backward the idle channel, and the screen shows 

.

9.4) By pressing [MENU] key, voice prompt "receiving storage" is issued, and the screen shows 

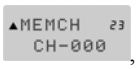
.

9.5) By pressing [MENU] key, voice prompt "transmitting storage" is issued, and the screen shows 

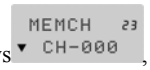
;

9.6) By pressing [EXIT] key, return to frequency mode.

◆If it is needed to set relay function, storage setting for the receiving and transmitting of channels in different frequencies

10.1) By pressing [MENU] →23, the screen shows 

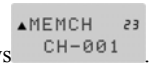
,

10.2) By pressing [MENU] key, voice prompt "store channel" is issued and the screen shows 

,

10.3) By pressing [▲] key or [▼] key, select forward or backward the idle channel, and the screen shows 

.

10.4) By pressing [MENU] key, voice prompt "receiving storage" is issued, and the screen shows 

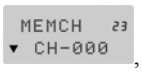
.

10.5) By pressing [EXIT] key, return to frequency mode.

10.6) Execute Step 4) , enter desired transmitting frequency;

10.7) By pressing [MENU] →27, the screen shows 

,

10.8) By pressing [MENU] key, voice prompt "store channel" is issued, and the screen shows 

,

10.9) By pressing [MENU] key, voice prompt "transmitting storage" is issued, and the screen shows 

;

10.10) By pressing [EXIT] key, return to frequency mode.

◆CTCSS scanning

Before setting CTCSS scanning, set the receiving frequency, ensure that signals can be received at such receiving frequency, and meanwhile cancel dual-frequency waiting function, as well as make the two-way radio operate in frequency mode.

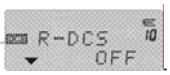
1) DCS scanning

1.1) Enter correct receiving frequency via the numeric keys.

1.2) By pressing [MENU] key, enter function menu setting after voice prompt "menu setting" is issued;

1.3) By pressing [▲] key or [▼] key, select forward or backward the Menu 10; or enter number 10 directly to enter Menu 10, the screen shows 

.

1.4) By pressing [MENU] key, voice prompt "DCS" is issued; by pressing [*/SCAN] key, the screen shows 闪烁 

.

·DCS sign flashing represents that the two-way radio has enter DCS scanning state; the numbers of the DCS will not move when there isn't signal;

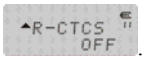
·After receiving signals, the numbers of the DCS move rapidly in turn according to sequence of standard CTCSS. When the two-way radio finds that the CTCSS in the receiving signals is consistent with one group standard DCS, the two-way radio will issue a "beep" prompt tone, and scanning stops.

·If you want to store this CTCSS scanned, press [MENU] key to store it, otherwise press [EXIT] key to exit.

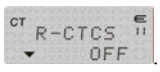
2) CTCSS scanning.

2.1) Enter correct receiving frequency via the numeric keys

2.2) By pressing [MENU] key, enter function menu setting after voice prompt "menu setting" is issued

2.3) By pressing [▲] key or [▼] key, select forward or backward the Menu 11; or enter number 11 directly to enter Menu 11, the screen shows 

.

2.4) By pressing [MENU] key, voice prompt " CTCSS " is issued; by pressing [*/SCAN] key, the screen shows 

.

·CT sign flashing represents that the two-way radio has enter CTCSS scanning state; the numbers of the CTCSS will not move when there isn't signal;

·After receiving signals, the numbers of the CTCSS move rapidly in turn according to sequence of standard CTCSS. When the two-way radio finds that the CTCSS in the receiving signals is consistent with one group standard CTCSS, the two-way radio will issue a "beep" prompt tone, and scanning stops.

·If you want to store this CTCSS scanned, press [MENU] key to store it, otherwise press [EXIT] key to exit.

◆Relay echo (relay acknowledgement tone)

Relay echo means that, due to the delay of the relay station in its judgment on the loss of carrier signals transmitted by the handset of the transmitter when the signal transmitted by the handset is retransmitted by the relay station, the relay station is in transmitting state for a little short time after the handset of the transmitter enters receiving state. Some HAMs just utilize this little short time to judge whether the relay station has retransmitted our signal.

Via the setting of Menu 30, 31 and 32, this residual signal of the relay station can be caught accurately when returning to receiving state so as to acknowledge whether our signal has been retransmitted by the relay station.

To do this, Menu 30 and Menu 31 must be set as OFF, and Menu 32 may do the selection between 1 and 10 which can be set as 5 based on the empirical value.

◆Sound and light alarm/alarm cancellation

In analog mode, enter emergency alarm state by long pressing the alarm function key [CALL]; the system issues alarm sound continuously, and the bright light flashes at the same time; after pressing the alarm function key [CALL], the system exits from emergency alarm state and stops issuing alarm sound.

 In emergency alarm state, enter PTT transmitting state by pressing [PTT] key (In emergency alarm state, except PTT key and emergency alarm key, other keys are unavailable) . When there is call incoming, alarm stops, the call can be received normally.

◆CTCSS/ CDCSS

CTCSS and CDCSS are mainly used to avoid receiving irrelevant calls in the same frequency. If CTCSS/CDCSS is set, only calls for which the same CTCSS signaling is set in the channel within the effective communication range can be received; but if CTCSS/CDCSS isn't set, all calls in the same channel within the effective communication range can be received.

You can set the CTCSS/CDCSS signaling of this two-way radio manually via frequency writing software. CTCSS/CDCSS signaling code can be set as any value within the range of 67.0~254.1/D023~D777 respectively.

A. CTCSS: (51 in total)

67.0，69.3，71.9，74.4，77.0，79.7，82.5，85.4，88.5，91.5，94.8，97.4，100.0，103.5，107.2，110.9，114.8，118.8，123.0，127.3，131.8，136.5，141.3，146.2，151.4，156.7，159.8，162.2，165.5，167.9，171.3，173.8，177.3，179.9，183.5，186.2，189.9，192.8，196.6，199.5，203.5，206.5，210.7，218.1，225.7，229.1，233.6，241.8，250.3，254.1。

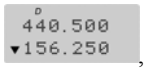
B. List of CDSs: (210 in total)

D023N，D025N，D026N，D031N，D032N，D036N，D043N，D047N，D051N，D053N，D054N，D065N，D071N，D072N，D073N，D074N，D114N，D115N，D116N，D122N，D125N，D131N，D132N，D134N，D143N，D145N，

D152N，D155N，D156N，D162N，D165N，D172N，D174N，D205N，D212N，D223N，D225N，D226N，D243N，D244N，D245N，D246N，D251N，D252N，D255N，D261N，D263N，D265N，D266N，D271N，D274N，D306N，D311N，D315N，D325N，D331N，D332N，D343N，D346N，D351N，D356N，D364N，D365N，D371N，D411N，D412N，D413N，D423N，D431N，D432N，D445N，D446N，D452N，D454N，D455N，D462N，D464N，D465N，D466N，D503N，D506N，D516N，D523N，D526N，D532N，D546N，D565N，D606N，D612N，D624N，D627N，D631N，D632N，D645N，D654N，D662N，D664N，D703N，D712N，D723N，D731N，D732N，D734N，D743N，D754N

D023I，D025I，D026I，D031I，D032I，D036I，D043I，D047I，D051I，D053I，D054I，D065I，D071I，D072I，D073I，D074I，D114I，D115I，D116I，D122I，D125I，D131I，D132I，D134I，D143I，D145I，D152I，D155I，D156I，D162I，D165I，D172I，D174I，D205I，D212I，D223I，D225I，D226I，D243I，D244I，D245I，D246I，D251I，D252I，D255I，D261I，D263I，D265I，D266I，D271I，D274I，D306I，D311I，D315I，D325I，D331I，D322I，D343I，D346I，D351I，D356I，D364I，D365I，D371I，D411I，D412I，D413I，D423I，D431I，D432I，D445I，D446I，D452I，D454I，D455I，D462I，D464I，D465I，D466I，D503I，D506I，D516I，D523I，D526I，D532I，D546I，D565I，D606I，D612I，D624I，D627I，D631I，D632I，D645I，D654I，D662I，D664I，D703I,D712I,D723I，D731I，D732I，D734I，D743I，D754I

Digital function operation

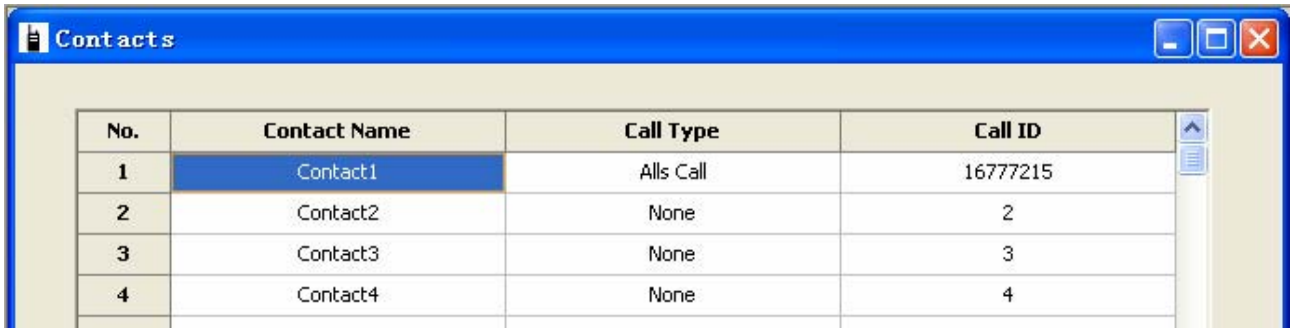
Digital mode (DMR system) of this two-way radio is compatible with analog mode; when digital channel is set, the screen shows 

, i.e., D icon is displayed in the first line of the screen. Digital mode doesn't support certain analog menus, i.e., in digital mode, unsupported menus shall be screened and skipped over.

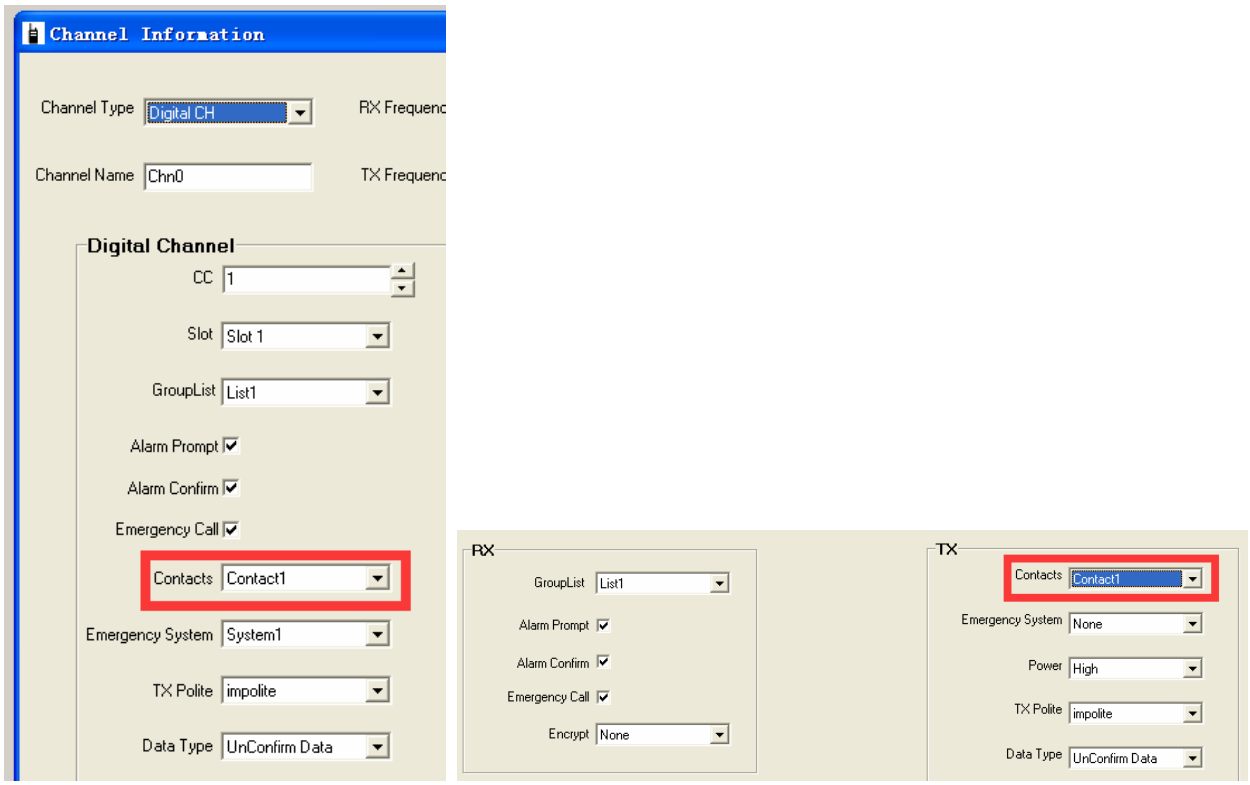
A part of functions of this two-way radio can be programmed manually via the keyboard, but more functions must be programmed via frequency writing software. First, frequency reading must be done when the two-way radio is turned on, parameters and functions shall be modified and edited then, and frequency writing and updating of two-way radio setting shall be completed at last.

1. Individual call in digital mode:

First, use the frequency writing software to establish new contact in digital contacts, select call type--voice individual call, and set the call ID as 1 (the range is 1~16776415) .



Then, add channel contacts in channel or A\B channel as shown below:



Do the frequency writing at last

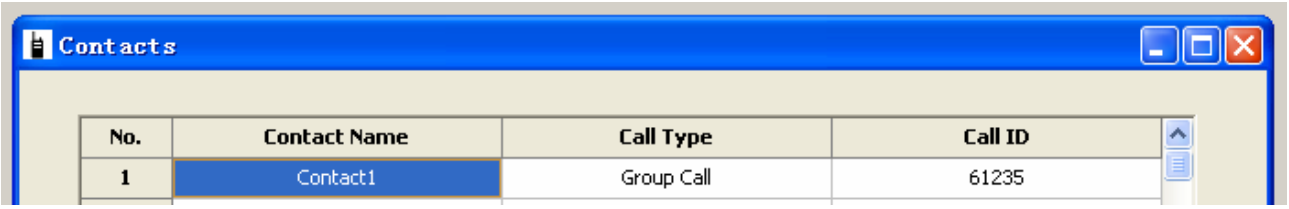
◇Make individual call

When you can receive and/or respond to individual call made by authorized individual two-way radio, you must preset your two-way radio in order to make individual call.

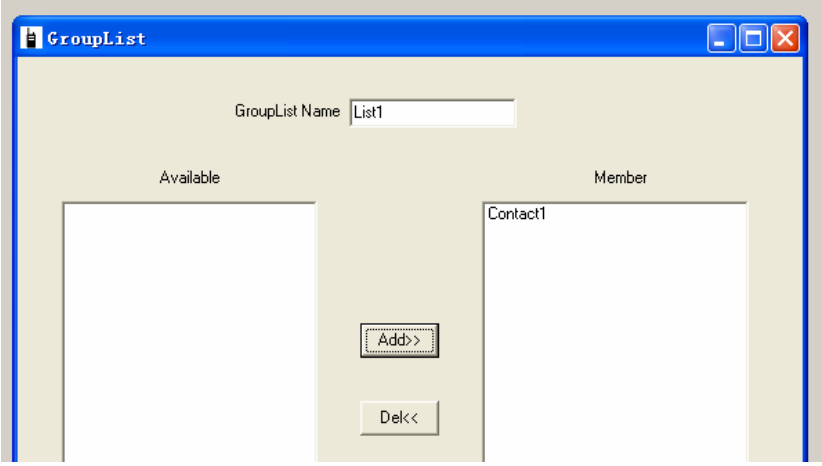
After execution of transmitting by pressing [PTT] key, you can make call to handset with ID number of 1, and only two-way radio with ANI-ID number of 1 can receive the call.

2. Group call in digital mode

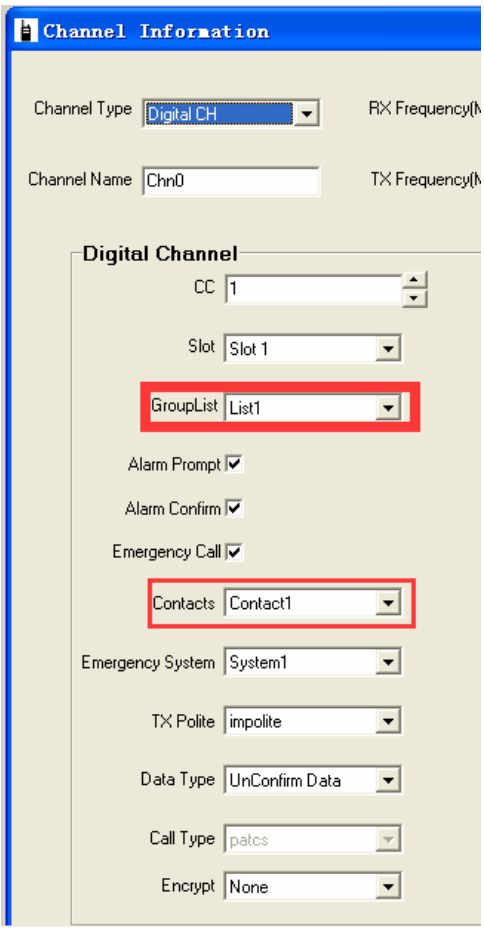
First, use the frequency writing software to establish new contact in digital contacts, select call type--voice group call, and set the call ID as 61235 (the range is 1~16776415) .

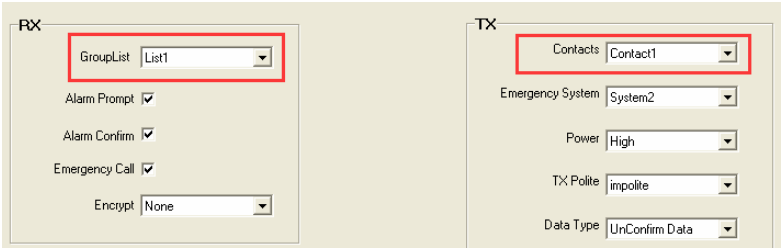


Next, add this contact in the receiving group list, select the Contact1 in the member list and press "ADD" key to incorporate it into selected members as shown below:



Then, add channel contacts and group call receiving list in channel or A\B channel as shown below:





Do the frequency writing at last

Make group call

After execution of transmitting by pressing [PTT] key, you can make call to Group ID61235, and the receiver can receive the call as long as Group ID61235 is included in its receiving list.

3. All call in digital mode

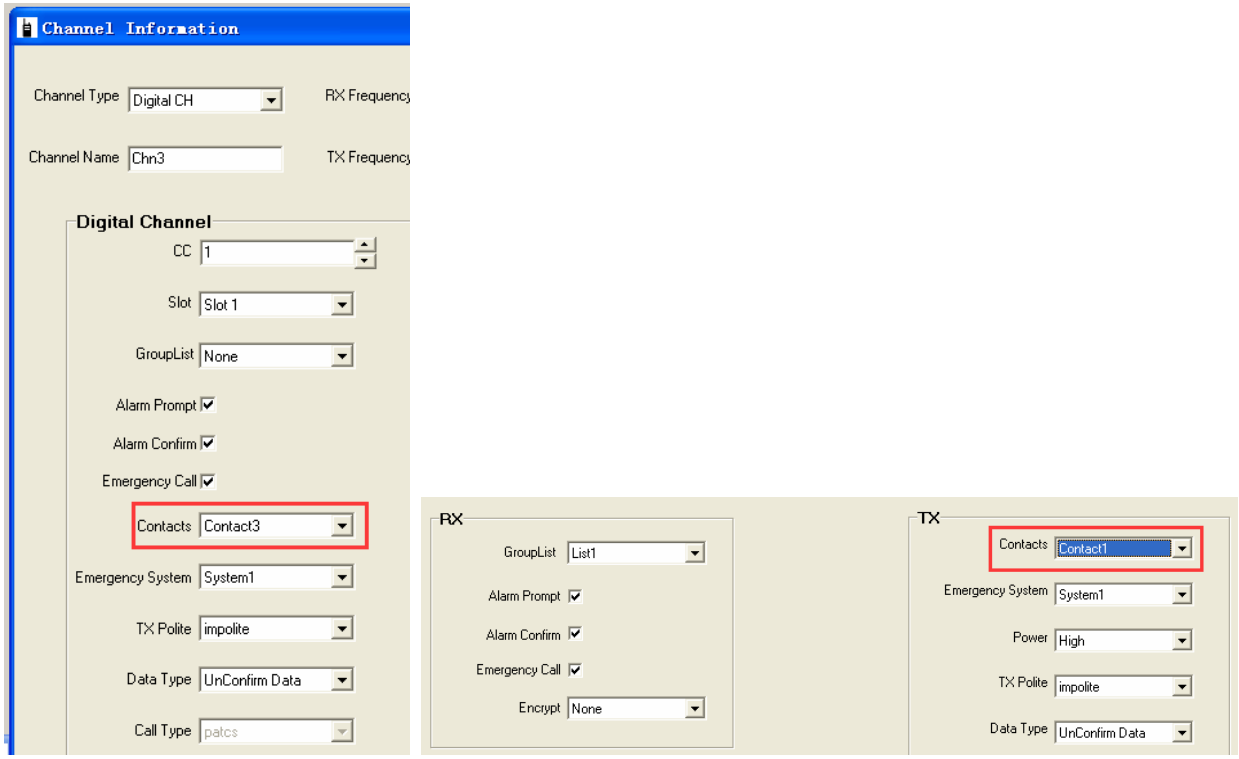
This functions allow you to transmit signals to all users on the channel. You must preset your two-way radio so as to allow

you to use the function. Setting steps are as follows:

First, use the frequency writing software to establish new contact in digital contacts, select call type--voice all call, and set the call ID as 16777215.

As shown in the figure below:

Then, add channel contacts in channel or A\B channel as shown below:



Do the frequency writing at last

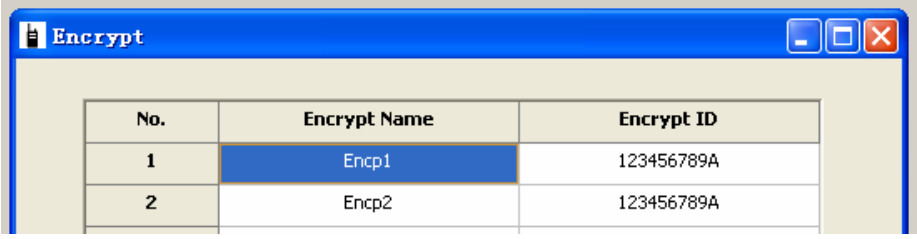
Make full call: After execution of transmitting by pressing [PTT] key, you can make call to all two-way radios in the same frequency.

4. Contacts setting in digital mode:

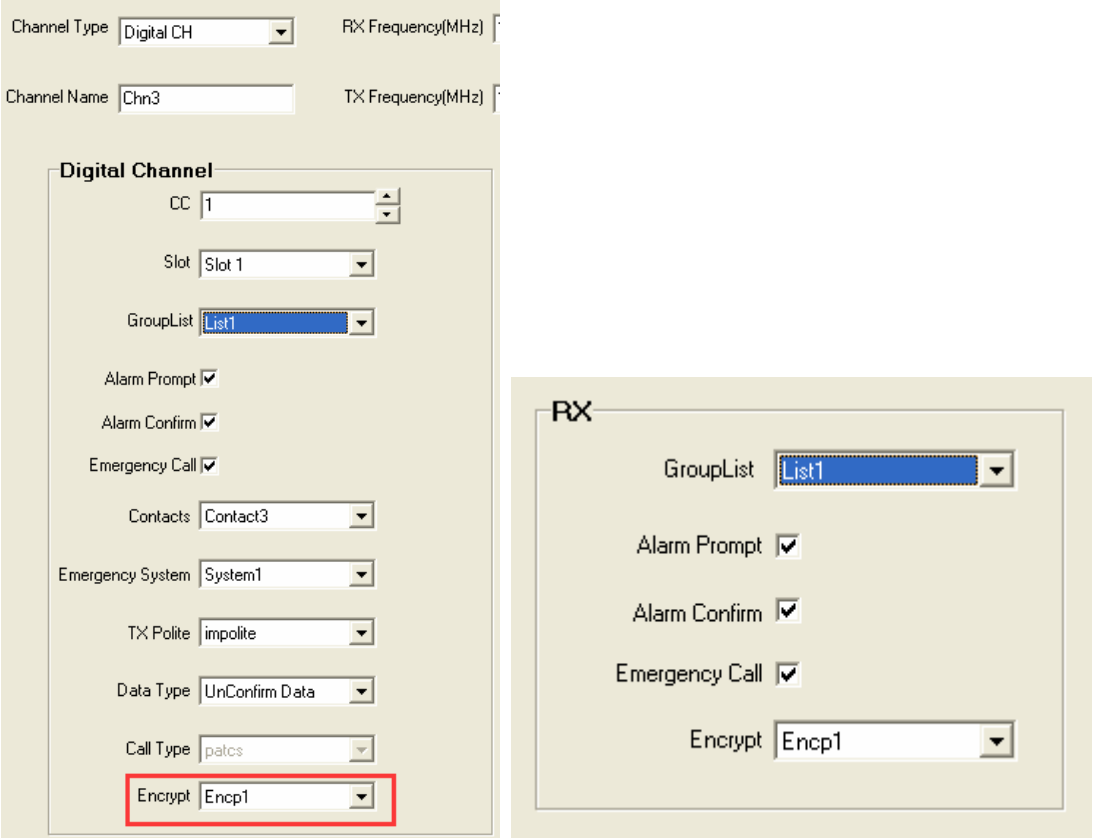
All contacts shall be established and written via frequency writing software, then current channel contact can be selected via Menu 31, i.e., select the ID to be called by pressing [PTT].

5. Voice encryption in digital mode

Set key value in encryption options of DMR service via frequency writing software (note that the key shall comprise several different characters, otherwise poor encryption effect may caused) as shown below:



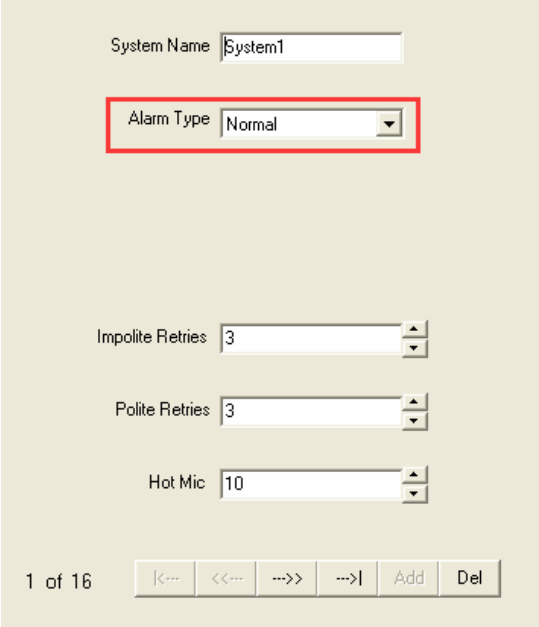
Then, select encryption key in channel or A\B channel as shown below:



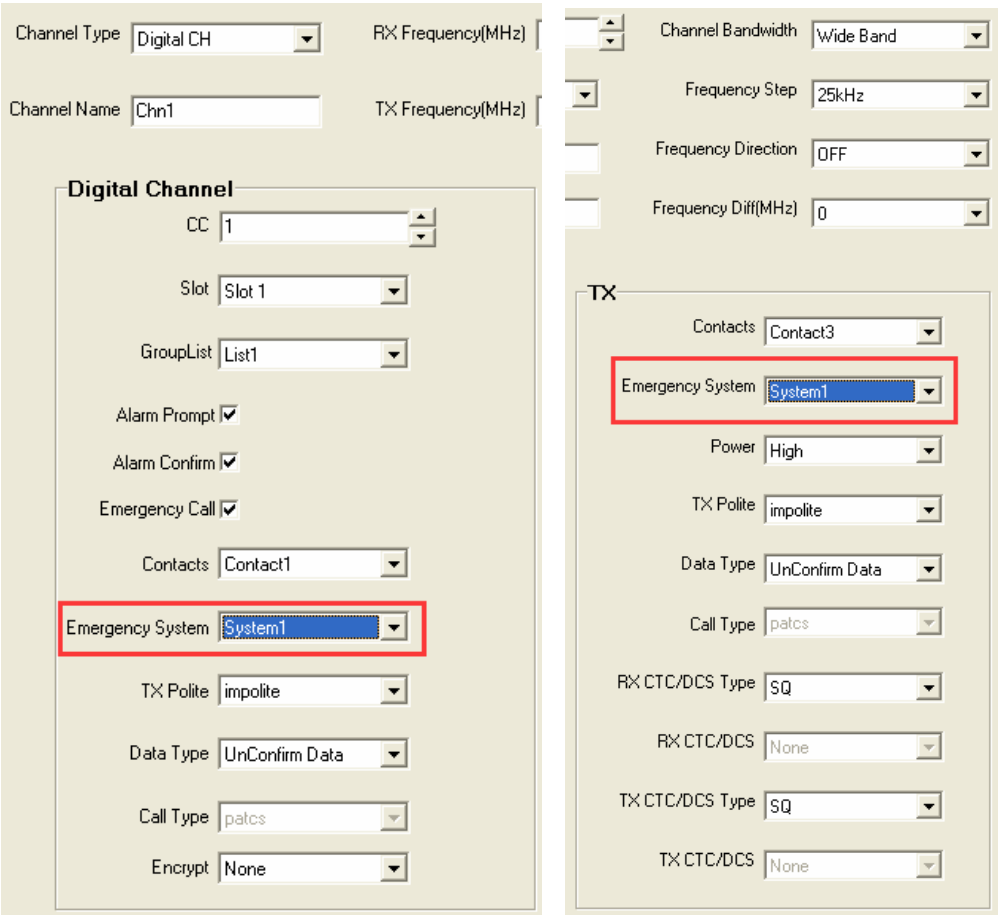
Do the frequency writing at last and show that the current channel has gone through encryption setting, only two-way radios having the same key can communicate, otherwise communication can't be achieved; the encryption options can also be changed via Menu 33.

6. Emergency alarm in digital mode:

First, use the frequency writing software to open the alarm interface as shown below:



Then, select alarm system in channel or A\B channel as shown below:



Do the frequency writing at last

In digital mode, emergency alarm can be transmitted by long pressing the side key (CALL key) . If the receiver doesn't tick the alarm prompt, alarm acknowledgement and call prompt, no reflection with respect to the alarm will be given; the transmitter can cancel emergency alarm actively, and the receiver can remove the alarm sound by pressing PTT key, but can't exit from the emergency alarm state actively unless resetting the two-way radio.

Two-way radio detection (available in digital mode)

If it is activated, the function can help you confirm, whether there are other two-way radios in the system that are activated, without disturbing two-way radio users. No voice or visual notices are sent to target two-way radio. The function is only applicable to user nickname or ID.

Two-way radio detection transmitting

Execute the operation steps below:

1) Access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 31 directly) until the screen shows and the pointer points to CONTCT; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key until the pointer on the screen points to P 1; then set as individual call P by pressing [MENU] key (note: Group call G and all call ALLCALL don't support two-way radio detection function)

4) Return to the previous menu.

5) Achieve two-way radio detection by long pressing [MONI] key. For example: ID of main two-way radio is 1 and ID of two-way radio detected is 2; "Beep" in long low pitch sounding after the [MONI] key is pressed represents failure of detection and that Two-way radio B is offline or current communication environment is so poor that the detection can't be completed successfully. "Beep" in high pitch sounding after the [MONI] key is pressed represents success of detection and that Two-way radio B is online.

Digital channel storage

Parameters that should be contained in a complete channel include receiving frequency, transmitting frequency, channel contacts, color code, transmitting power, time slot, encryption, scan channel adding, and channel name, etc. Except that scan channel adding and channel name need to be edited with frequency writing software, all other parameters can be set in frequency mode and stored in specified channel number by Menu 19 channel storage.

For example, it is required that the following digital channel parameters shall be stored in Channel Number 001.

Receiving frequency	454.325 MHZ
Transmitting frequency	460.325 MHZ
Channel contacts	Selection
Color code	1
Transmitting power	High
Time slot	Slot1
Encryption	Off
Join scanning queue	
Channel name	Write in frequency writing software as necessary

■Operation steps for deletion of digital channel:

1) In digital channel mode, access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 20 directly) until the screen shows and the pointer points to **DELCH**; then perform the selection operation by pressing [MENU] key.

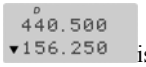
3) Press [▲] key or [▼] key until the pointer on the screen pointing to CH-001, representing that Channel 001 has previously stored

channel parameters and can be deleted.

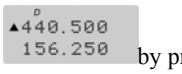
·Only 001 is displayed (CH character isn't displayed) , representing that Channel 001 doesn't have channel parameters, needn't be deleted, and can be stored directly.

4） Then delete the channel by pressing [MENU] key and the channel becomes idle channel (Only channel number is displayed, CH character isn't displayed) .

■Operation steps for storage of digital channel:

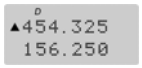
1) Select digital channel (pay attention to Symbol D) , switch to frequency mode by pressing [VFO/MR] key, 

is displayed on the screen.

2) In frequency mode, make A/B frequency pointer points to A (uplink frequency point) 

by pressing [A/B] key.

3) Make the two-way radio operate in UHF band by pressing [BAND] key;

4) Adjust the frequency to 454.325MHZ by pressing numeric keys 4,5,4,3,2,5 in turn, 

is displayed on the screen.

5) Power setting: Select transmitting power TXP as HIGH by pressing [MENU] →2→ [MENU]→ [▲] or [▼], then return to the menu → [MENU];

6) Channel contacts setting: Select channel contacts CONTCT as G by pressing →31→【MENU】→[▲] or [▼],then return to the menu → [MENU],

7) Color code setting: Select color code CC as 1 by pressing 32→【MENU】→[▲] or [▼],then return to the menu → [MENU];

8) Encryption setting: Select encryption ENC-KEY as OFF by pressing 33→【MENU】→[▲] or [▼],then return to the menu → [MENU];

9) Time slot setting: Select time slot BS-SLOT as SLOT1 by pressing 34→【MENU】→[▲] or [▼],then return to the menu → [MENU];

10) Frequency difference direction setting: Select frequency difference direction SFT-D as ＋ by pressing 17→【MENU】→[▲] or [▼],then return to the menu → [MENU];

Note: The frequency difference direction in this example is ＋.

·＋ means that transmitting frequency is the receiving frequency plus frequency difference;

·－ means that transmitting frequency is the receiving frequency plus frequency difference;

·OFF means off. In frequency mode, there isn't difference between transmitting frequency and receiving frequency.

11) Frequency difference setting: Press 18→ [MENU] →voice prompt "frequency difference" and screen display OFFSET →press numeric keys to enter 006000→[MENU].

Note: The frequency different in this example is 006.000MHZ. It shall be set according to the actual situation of the relay station.

12) Channel storage

12.1) Access to the menu by pressing [MENU] key

12.2) Press [▲] key or [▼] key (or enter 19 directly) until the screen shows and the pointer points to MEMCH; then perform the selection operation by pressing [MENU] key. Voice prompt "store channel" is issued.

12.3) Press [▲] key or [▼] key to select forward or backward Channel 001 (or idle channel) .

12.4) Then press [MENU] key to confirm channel storage, and now CH-001 is displayed at the position of channel number.

By the above settings, press [FVO/MR] key to switch to channel mode, enter 1 directly, and now you can find that there are channel parameters on channel number 001. You can also decide the display mode of channel parameters via Menu 13 and Menu 14. Menu 13 decides the channel display mode of uplink channel; Menu 14 decides the channel display mode of downlink channel.

·FREQ means frequency mode;

·CH means channel mode;

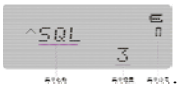
·NAME means channel number and channel name and mode.

Menu operation

■What is menu?

For this two-way radio, many functions can be selected and configured via menu controlled by software rather than physical control components of the two-way radio. Once you become familiar with the menu system, its various functions will make you feel convenient. You can customize various setting and programming functions for this two-way radio as needed to avoid frequent use of keys, control buttons and switches.

■Access to menu and menu operation (operation in standby mode)

1) Press [MENU] key to enter function menu setting, "menu setting" voice prompt is issued, and the screen shows 

·The display screen shows simple menu description and setting and menu number.

2) Press [▲] key or [▼] key to select forward (rising prompt tune) or backward (falling prompt tune) the desired menu number, or enter into the desired menu number by or entering a number according to the sequence number of the menu.

·When changing menu number, the display screen will show a short description of each menu and current parameters. 

3) Enter menu content setting by pressing [MENU] key, simple voice prompt (such as stepped frequency) is issued, the screen shows 

, the pointer on the left points down to prompt that there is options to be selected.

4) Press [▲] key or [▼] key to select forward or backward the desired parameters;

5) Confirm by pressing [MENU] key, voice prompt "confirm" is issued, save and return to previous menu;

6) Cancel the save action and exit from the menu mode by pressing [EXIT] key, return to main interface.

■Rapid menu search function

After entering into menu selection or function parameter selection under menu items by pressing [MENU] key, search upward or downward the menu and various parameters by pressing [▲] key or [▼] key once, or search rapidly upward or downward by pressing and holding the [▲] key or [▼] key.

Setting of following menu items are unavailable in channel mode: CTCSS, DCS, wideband/narrowband, BCL, scan channel adding, signaling code and channel name. In current channel mode, high/low power can be switched rapidly via [#/⊓O] key only.

■Menu information list

DMR of this two-way radio is compatible with FM analog. The menu is divided into analog menu and DMR digital menu.

FM analog menus shall be accessed and operated in analog channel, as detailed below:

Menu number	Display character	Function description	Display character of secondary menu	Instructions for setting of secondary menu
0	SQL	Squelch level	0,…,9	The lower the squelch level is, the more susceptible to interference the two-way radio is; the higher the squelch level is, the less sensitive the two-way radio is; thus, a middle value shall be preferably set.
1	STEP	Stepped frequency	2.50K	In frequency mode, change step value of frequency by pressing ▲/▼ key.
			5.00K	
			6.25K	
			10.00K	
			12.50K	
			20.00K	
			25.00K	
			50.00K	
2	TXP	Transmitting power	HIGH	High power transmitting
			LOW	Low power transmitting * In channel mode, switch power by pressing # key
3	SAVE	Power saving mode	OFF	Deactivate the power saving mode
			1	Power saving in 1:1 way
			2	Power saving in 1:2 way
			3	Power saving in 1:3 way
			4	Power saving in 1:4 way
4	VOX	Voice-operated transmitting	OFF	Deactivate voice-operated transmitting; when voice-operated transmitting is activated, transmitting can be executed just by shouts without pressing PTT key.
			1,2,…,10	Sound pressure level for activating voice-operated transmitting
5	**WN**	**Channel bandwidth**	**WIDE**	**Wideband operating**
			NARR	**Narrowband operating**
6	**ABR**	**Automatic backlight**	**OFF**	**Deactivate automatic backlight**
			ON	**Activate automatic backlight**
7	TDR	Dual-frequency waiting	OFF	Deactivate dual-frequency waiting
			ON	Activate dual-frequency waiting
8	BEEP	Prompt tone switch	OFF	Deactivate operation prompt tone
			ON	Activate operation prompt tone
9	TOT	Time-out time	15,30,…,600	The number is in a range from 15 to 600 and increases in step of 15, indicating the maximum transmitting time after pressing PTT key.
10	R-DCS	Receiving DCS	OFF	No CTCSS
			D023N,…,D754I	Standard sequence of DCS
11	R-CTCS	Receiving CTCSS	OFF	No CTCSS
			67.0Hz,…,254.1Hz	Standard sequence of CTCSS; meanwhile, the standard or non-standard CTCSS can be entered via the keyboard directly.
12	T-DCS	Transmitting DCS	OFF	No CTCSS
			D023N,…,D754I	Standard sequence of DCS
13	T-CTCS	Transmitting CTCSS	OFF	No CTCSS
			67.0Hz,…,254.1Hz	Standard sequence of CTCSS; meanwhile, the standard or non-standard CTCSS can be entered via the keyboard directly.

14	VOICE	Prompt language	OFF	Deactivate prompt language
			CHI	Prompt in Chinese
			ENG	Prompt in English
15	SC-REV	Scanning recovery mode	TO	Time scanning mode means continuing the scanning 5 seconds after finding the signal
			CO	Carrier scanning mode means continuing the scanning after the signal that is found disappears
			SE	Search scanning mode means stopping scanning after finding the signal
16	ANI-ID	Inquiry of ID of this two-way radio		Used for inquire the ID code set in this two-way radio (The ID code can only be written via frequency writing software).
17	MDF-A	A channel display mode	FREQ	In segment A channel mode, the channel is displayed by way of frequency.
			CH	In segment A channel mode, the channel is displayed by way of channel number.
			NAME	In segment A channel mode, the channel is displayed by way of channel name (Specific name is set in frequency writing software)
18	MDF-B	B channel display mode	FREQ	In segment B channel mode, the channel is displayed by way of frequency.
			CH	In segment B channel mode, the channel is displayed by way of channel number.
			NAME	In segment B channel mode, the channel is displayed by way of channel name (Specific name is set in frequency writing software)
19	BCL	Busy channel lockout	OFF	Allow transmitting even if the channel is occupied.
			ON	Prohibit transmitting if the channel is occupied.
20	AUTOLK	Automatic keyboard lock	OFF	Deactivate automatic keyboard lock
			ON	Activate automatic keyboard lock function
21	SFT-D	Frequency difference direction	OFF	In frequency mode, there isn't difference between transmitting frequency and receiving frequency.
			+	In frequency mode, the transmitting frequency is the receiving frequency plus the frequency difference.
			-	In frequency mode, the transmitting frequency is the receiving frequency minus the frequency difference.
22	OFFSET	Frequency difference	00.000,…,69.990	Difference between transmitting frequency and receiving frequency in frequency mode (controlled by frequency difference direction)
23	MEMCH	Channel storage	000,…,127	For channel storage, it is used to indicate the number of the channel to be stored. If CH-character is displayed in front of the numbers, the channel has previously stored channel parameters.
24	DELCH	Channel deletion	000,…,127	Delete the channel parameters of specified channel. If there isn't CH-character in front of the numbers, the channel doesn't have parameters, and the operation is invalid.
25	WT-LED	Standby backlight selection	OFF	Turn off the backlight
			BLUE	In standby mode, turn on the blue light.
			ORANGE	In standby mode, turn on the orange light.
			PURPLE	In standby mode, turn on the purple light.
26	RX-LED	Receiving backlight	OFF	Turn off the backlight

		selection	BLUE	In receiving mode, turn on the blue light.
			ORANGE	In receiving mode, turn on the orange light.
			PURPLE	In receiving mode, turn on the purple light.
27	TX-LED	Transmitting backlight selection	OFF	Turn off the backlight
			BLUE	In transmitting mode, turn on the blue light.
			ORANGE	In transmitting mode, turn on the orange light.
			PURPLE	In transmitting mode, turn on the purple light.
28	BAND	Frequency band selection	VHF	Set the working frequency band as 136~174MHz
			UHF	Set the working frequency band as 400~520MHz
30	STE	Tail tone elimination	OFF	The two-way radio doesn't send out shutdown code after PTT key is released. Let it appear when the signaling is retransmitted by the relay station so as to confirm that the signal transmitted by this two-way radio is received and retransmitted.
			ON	The two-way radio sends out shutdown code after PTT key is released to inhibit instantaneous noise appeared at the receiver.
31	RP-STE	Across-relay tail tone elimination	OFF	When transmitting across the relay and retransmitting, after the transmitter releases the PTT key, the two-way radio enters receiving state. Due to the delay of relay, the instant signal transmitted by the relay can be received。The value of the menu item shall be adjusted to ensure that no noise of this two-way radio is generated when transmitting across the relay, so as to confirm whether the relay is operating. The menu item shall be set OFF, which is available only in analog mode (unavailable for digital mode).
			1,2,…,10	
32	PRT-RL	Delay time of relay tail tone	OFF	When the signal is transmitted across the relay station and retransmitted by it, in order to confirm whether the relay station has retransmitted the signal for this two-way radio, the delay time of the relay station stopping transmitting shall be utilized to confirm that the signal has been retransmitted. The menu item is used to adjust the time of the noise. If the noise isn't needed, please set it as OFF, which is available only in analog mode (unavailable for digital mode).
			1,2,…,10	
33	PONMGS	Startup display	FULL	Full-screen character display
			MGS	Type and model display
34	ROGER	Call end prompt tone	ON	Activate call end prompt tone
			OFF	Deactivate call end prompt tone
35	RESET	Initialization	VFO	Menu initialization
			ALL	Menu and channel initialization
36	**MODE**	**Operation mode**	FM	Inquire the operation mode in channel mode and modify the operation mode in VFO mode
			DMR	Inquire the operation mode in channel mode and modify the operation mode in VFO mode
37	CP Ver.	Software version	XXXXXX	Inquire software version number (date)

DMR digital menus shall be accessed and operated in digital channel, as detailed below:

Menu	Display	Function description	Display character of	Instructions for setting of secondary menu

number	character		secondary menu	
1	STEP	Stepped frequency	2.50K	In frequency mode, change step value of frequency by pressing ▲/▼ key.
			5.00K	
			6.25K	
			10.00K	
			12.50K	
			20.00K	
			25.00K	
			50.00K	
2	TXP	Transmitting power	HIGH	High power transmitting
			LOW	Low power transmitting
3	SAVE	Power saving mode	OFF	Deactivate the power saving mode
			1	Power saving in 1:1 way
			2	Power saving in 1:2 way
			3	Power saving in 1:3 way
			4	Power saving in 1:4 way
4	VOX	Voice-operated transmitting	OFF	Deactivate voice-operated transmitting; when voice-operated transmitting is activated, transmitting can be executed just by shouts without pressing PTT key.
			1,2,…,10	Sound pressure level for activating of voice-operated transmitting
6	ABR	**Automatic backlight**	**OFF**	**Deactivate automatic backlight**
			ON	**Activate automatic backlight**
7	TDR	Dual-frequency waiting	OFF	Deactivate dual-frequency waiting
			ON	Activate dual-frequency waiting
8	BEEP	Prompt tone switch	OFF	Deactivate operation prompt tone
			ON	Activate operation prompt tone
9	TOT	Time-out time	15,20,…,600	The number is in a range from 15 to 495 and increases in step of 15, indicating the maximum transmitting time after pressing PTT key.
10	VOICE	Prompt language	OFF	Deactivate prompt language
			ON	Activate prompt language
11	SC-REV	Scanning recovery mode	TO	Time scanning mode means continuing the scanning 5 seconds after finding the signal
			CO	Carrier scanning mode means continuing the scanning after the signal that is found disappears
			SE	Search scanning mode means stopping scanning after finding the signal
12	ANI-ID	Inquiry of ID of this two-way radio		Used for inquire the ID code set in this two-way radio (The ID code can only be written via frequency writing software) .
13	MDF-A	A channel display mode	FREQ	In segment A channel mode, the channel is displayed by way of frequency.
			CH	In segment A channel mode, the channel is displayed by way of channel number.
			NAME	In segment A channel mode, the channel is displayed by way of channel name (Specific name is set in frequency writing software)
14	MDF-B	B channel display mode	FREQ	In segment B channel mode, the channel is displayed by way of frequency.
			CH	In segment B channel mode, the channel is displayed by way of frequency.
			NAME	In segment B channel mode, the channel is

				displayed by way of channel name (Specific name is set in frequency writing software)
15	BCL	Busy channel lockout	OFF	Allow transmitting even if the channel is occupied.
			ON	Prohibit transmitting if the channel is occupied.
16	AUTOLK	Automatic keyboard lock	OFF	Deactivate automatic keyboard lock
			ON	Activate automatic keyboard lock function
17	SFT-D	Frequency difference direction	OFF	In frequency mode, there isn't difference between transmitting frequency and receiving frequency.
			+	In frequency mode, the transmitting frequency is the receiving frequency plus the frequency difference.
			-	In frequency mode, the transmitting frequency is the receiving frequency minus the frequency difference.
18	OFFSET	Frequency difference	00.000,…,69.990	Difference between transmitting frequency and receiving frequency in frequency mode (controlled by frequency difference direction)
19	MEMCH	Channel storage	000,…,127	For channel storage, it is used to indicate the number of the channel to be stored. If CH-character is displayed in front of the numbers, the channel has previously stored channel parameters.
20	DELCH	Channel deletion	000,…,127	Delete the channel parameters of specified channel. If there isn't CH-character in front of the numbers, the channel doesn't have parameters, and the operation is invalid.
21	WT-LED	Standby backlight selection	OFF	Turn off the backlight
			BLUE	In standby mode, turn on the blue light.
			ORANGE	In standby mode, turn on the orange light.
			PURPLE	In standby mode, turn on the purple light.
22	RX-LED	Receiving backlight selection	OFF	Turn off the backlight
			BLUE	In receiving mode, turn on the blue light.
			ORANGE	In receiving mode, turn on the orange light.
			PURPLE	In receiving mode, turn on the purple light.
23	TX-LED	Transmitting backlight selection	OFF	Turn off the backlight
			BLUE	In transmitting mode, turn on the blue light.
			ORANGE	In transmitting mode, turn on the orange light.
			PURPLE	In transmitting mode, turn on the purple light.
24	BAND	Frequency band selection	VHF	Set the working frequency band as 136~174MHz
			UHF	Set the working frequency band as 400~480MHz
26	PONMGS	Startup display	FULL	Full-screen character display
			MGS	Type and model display
27	ROGER	Call end prompt tone	ON	Activate call end prompt tone
			OFF	Deactivate call end prompt tone
28	RESET	Initialization	VFO	Menu initialization
			ALL	Menu and channel initialization
29	MODE	Operation mode	FM	Inquire the operation mode in channel mode and modify the operation mode in

				VFO mode
			DMR	Inquire the operation mode in channel mode and modify the operation mode in VFO mode
30	MSG	Message	INBOX	Inbox (not available temporarily)
			OUTBOX	Outbox (not available temporarily)
31	Contact	Digital contacts	Contact name	Set via frequency writing software
32	CC	Color code	0,1,…,15	Set color code value in digital mode
33	ENC-KEY	Encryption key	Key name	Set via frequency writing software
34	BS-SLOT	Time slot	SLOT1	Time slot 1
			SLOT2	Time slot 2
35	CP Ver.	Software version	XXXXXX	Inquire software version number (date)

Note: MSG，CP Ver. doesn't support modification; ANI-ID needs to be modified via frequency writing software.

Auxiliary functions

Restore factory settings

In case of a failure of this two-way radio due to misoperation or setting error, resetting the microprocessor may solve the problem. This function operation can be used to restore all settings and channels of this two-way radio to factory state. Memory data and stored information may be lost during the resetting process. Before resetting, please back up or write down important data.

■All reset

Execute the operation steps below:

1) Access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 28 directly) until the screen shows and the pointer points to RESET; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key until the pointer on the screen points to ALL; then execute all reset operation by pressing [MENU] key.

4) During operation, go back and exit from the menu mode by pressing [EXIT] key. By resetting, data shall be deleted and factory settings of the two-way radio shall be restored, therefore, this function shall be used prudently.

■VFO reset

"VFO reset" means resetting two-way radio parameters except DTMF memory, memory channel content and call channel content. Execute the operation steps below:

1) Access to the menu by pressing [MENU] key.

2) Press [▲] key or [▼] key (or enter 28 directly) until the screen shows and the pointer points to RESET; then perform the selection operation by pressing [MENU] key.

3) Press [▲] key or [▼] key until the pointer on the screen points to VFO; then execute VFO reset by pressing [MENU] key.

4) The screen shows WAIT… until the two-way radio is reset.

▲During operation, go back and exit from the menu mode by pressing [EXIT] key. By resetting, data shall be deleted and factory settings of the two-way radio shall be restored, therefore, this function shall be used prudently.

■Troubleshooting guide

Problem	Solution
Without power supply, the two-way radio doesn't work.	The battery may has run out. Please replace or charge the battery. The battery may be installed improperly. Please remove and reinstall the

	battery once.
The battery runs out again not long after charging.	The battery reaches its service life limit (about 300 charging and discharging cycles), please replace the battery.
The two-way radio can't make call to other members in the group.	Please confirm whether your frequency and CTCSS signal tone are consistent with that of other members in the group. Other members in the group may be too far away. Please confirm whether you are within the valid range of other two-way radios.
Digital channel can't achieve individual call or group call	**If the two-way radio can't make normal call in digital mode, please check whether the color code, contact and receiving group address are abnormal. Investigate in accordance with Point 1 and Point 2 of the digital operation instructions.**
Communication distance is short.	Confirm whether the antenna is in good contact and is the original antenna, and whether the battery voltage is normal. The dealer adjusts the squelch level.
Other tones (not from group members) appear in the channel.	Please change the CTCSS signal tone. At this time, be sure to change the signal tone of all two-way radios in the group.
Noise level is high.	The two-way radio is too far away from other members. After adjusting the valid communication range, reset the two-way radio and try again. The two-way radio is in a bad location such as in a place that is blocked by a high building or in basement. After transferring the two-way radio to a flat and open place, reset it and try again. The two-way radio is interrupted by external environment or electromagnetic field. Keep the two-way radio away from equipments which may interrupt it.

▲If the methods above fail to solve your problems or you meet some other failures, please contact local dealer for more technical support.

■Maintenance and cleaning

To ensure that this two-way radio exerts its excellent performance, thereby extending its service life, please familiarize yourself with the content below and conduct daily maintenance and cleaning better.

■Maintenance

- ◆ Don't put the two-way radio in an environment with substance that may erode electronic circuit;
- ◆ During carrying or using the two-way radio, don't hold the antenna or external microphone directly with hands;
- ◆ When the accessories are not used, close the accessory interface cover properly.

■Cleaning

- ◆ Please remove the dust adhered on the surface of the two-way radio and the charging pole with clean and dry lint free cloth or brush.
- ◆ Wipe the dust and dirt on the two-way radio with lint free cloth to avoid bad contact;
- ◆ After the two-way radio has been used for a long term, its keys, control knob and shell get dirty easily. Neutral detergent (rather than highly corrosive chemical agent) and wet cloth may be used to clean them. After cleaning, be sure that the two-way radio are thoroughly dry, otherwise it shall not be used.
- ◆ When the two-way radio isn't used, close the cover of accessory jack;

Please turn off the two-way radio and take the battery out before you clean the two-way radio.

Main technical indexes

General specifications:

Frequency range	VHF: 136-174MHz /UHF:400-520MHz (Dual Band)
Storage channel	128 groups
Stepped frequency	2.5/5/6.25/10/12.5/20/25kHz
Operating voltage	DC7.4 V (rechargeable lithium battery)
Frequency stability	±1.5ppm
Operating temperature	-20℃—+50℃
Operation mode	same-frequency simple or different-frequency simplex
Antenna impedance	50Ω
Battery capacity	1500mAh
Volume	110×58×32mm (excluding antenna)

Transmitting:

Output power	4W/1W
Modulation (wideband/narrowband)	Analog: 16K¢F3E/11 K¢F3E Digital: 4FSK
Maximum frequency deviation (wideband/narrowband)	≤5KHz/≤2.5KHz
FSK allowable error rate	≤3%
Spurious power	**≤7.5uW**
Adjacent channel power	≤-65dB/≤-60dB
Signal to noise ratio (wideband/narrowband)	≥-45dB/≥-40dB
CTCSS/DCS frequency deviation (wideband/narrowband)	0.7±0.1KHz/0.4±0.1KHz
Modulation sensitivity	8—12mV
Transmitting current	≤1.5A

Receiving:

Analog sensitivity	-122dBm (12dB SINAD)
Digital sensitivity	-120dBm(BER≤5%)
Audio power	1W
Audio distortion	<10%
Intermodulation (wideband/narrowband)	≥62dB/≥58dB
Adjacent channel selectivity (wideband/narrowband)	≥65dB/≥60dB
Receiving current	≤380mA

All specifications are subject to change without prior notice or taking any responsibility.

■ List of toxic and hazardous substances and elements

Part Name	Toxic and Hazardous Substances and Elements					
	Pb	Hg	Cd	Cr (Vi)	PBB	PBDE
Electronic parts	×	o	o	o	o	o
Mechanical parts	o	o	o	o	o	o
o: means that the content of the toxic and hazardous substance in such parts doesn't exceed the limit specified in SJ/T11363-2006. ×: means that the content of the toxic and hazardous substance in such parts exceeds the limit specified in SJ/T11363-2006.						

Disclaimer (attached on the back cover of the instructions)

- The company has strived to ensure the accuracy and completeness of this operating instructions during the preparation, but shall not be liable for any possible errors or omissions during printing.
- The company reserves the right to make changes to product design and specifications due to continuous technical development without prior notice.

§ 15.19 Labelling requirements.

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.

§ 15.21 Information to user.

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

§ 15.105 Information to the user.

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.

*** RF warning for Portable device:**

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-2005, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013.

SAR value:

Face-held: **1.665 W/Kg**
Body-Worn: **2.928 W/Kg**

Body-worn Statement:

Body-worn measurements-per FCC KDB447498 page 22 “When body-worn accessory SAR testing is required, the body-worn accessory requirements in section 4.2.2 should be applied. PTT two-way radios that support held-to-ear operating mode must also be tested according to the exposure configurations required for handsets. This generally does not apply to cellphones with PTT options that have already been tested in more conservative configurations in applicable wireless modes for SAR compliance at 100% duty factor.” According to KDB643646 D01 for Body SAR Test Considerations for Body-worn Accessoires: Body SAR is measured with the radio placed in a body-worn accessory, positioned against a flat plantom, representative of the normal operating conditions expected by users and typically with a standard default audio accessory supplied with the radio, may be designed to operate with a subset of the combinations of antennas, batteries and body-worn accessores, when a default audio accessory does not fully support all accessory must be selected to be the default audio accessory for body-worn accessories testing. If an alternative audio accessory cannot be identified, body-worn accessories should be tested without any body accessories should be tested without any audio. In general, all sides of the radio that may be positioned facing the user when using a bodyworn accessory must be condisered for SAR compliance.