HYDX

D21PLUS
Digital Two-way Radio

User's Manual

HYDX

Fujian Juston Electronic Equipment Co.,Ltd.

www.hydxradio.com
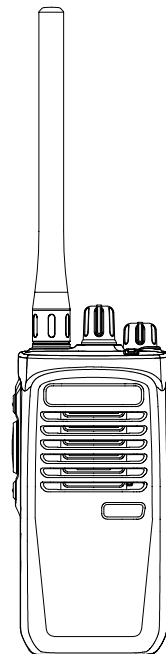
DMR
DIGITAL MOBILE RADIO ASSOCIATION

Brief Introduction

Thank you for buying handheld walkie-talkie. The walkie-talkie will provide cost-effective communication equipment and perfect solutions for various business places. This product uses the professional commercial frequencies, it is necessary to apply for permission to the wireless administrator of the provinces and autonomous regions in the local country.

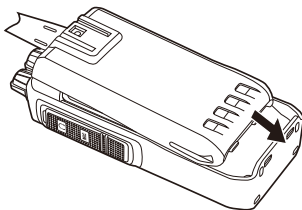Please read this manual carefully before use to know how to operate the radio properly.

Contents

Before Using

Install/Remove Battery

Align and insert the two bulging parts at the bottom of the battery into the battery positioning hole which at the bottom of the radio, then press the battery down to make the battery buckle on the radio completely locked it.

To remove the battery, make sure the radio is off first, and push the battery buckle on the top of radio upward to remove the battery.
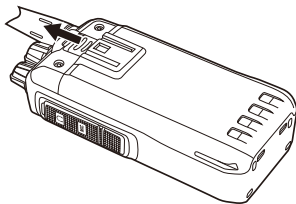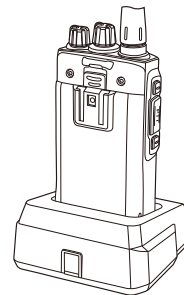
⚠️**Warning**:

1. Do not attempt to disassemble any rechargeable lithium-ion batteries, if the battery has a short circuit situation, it will cause an explosion.

2. Do not make the battery terminal short circuit or throw away the battery in the fire.

Charge the Battery

1. Insert the DC plug of the AC adapter into the DC jack on the back of the charger, then connect the AC adapter to the AC power cord outlet.

2. Align the battery charging contact piece with the contact piece in the charger slot and insert it into the charger. To know the correct location of the battery, you can refer to the image below for details. If charge the battery with radio, please turn off the radio first. And when viewing the charger from the front, the antenna interface should be on the left.

3. If the battery is inserted correctly, the LED will light on red. Charge the completely dead battery needs 1.5-4.5 hours (This depends on the charging battery).

4. When the charging is complete, the LED indicator will light on green.

5. Remove the battery from the charger and turn of f the power of the AC adapter.

⚠️**Warning**:

1. Need to use the Li-ion battery.

2. Only can use desktop charger and AC adaptor.

3. To reduce the risk of explosion, please charge it in the place where are no danger.

4. The battery should be charged at +5℃~+40℃. If the temperature exceeds this, it will cause damage to the battery.

5. Don't put the battery to overheating environme- nt, such as in the sun, fire etc.

Low Power Indicate

As the battery discharges during using, the voltage will gradually decrease. The radio will make a alarm tone of low power when the voltage is too low.

⚠ **Warning**:

If the replaced battery is wrong, maybe it will happen explosion, so the replaced battery should be of the same or equivalent specifications.

Install/Remove the Belt Clip

Install: 1. Remove the battery first.

2. Align the belt clip's slot with the installation slot which on the back of battery, and push down the belt clip into installation slot until it is snapped.

Remove: 1. Remove the battery first.

2. Press the buckle of the belt clip and pull it upward.
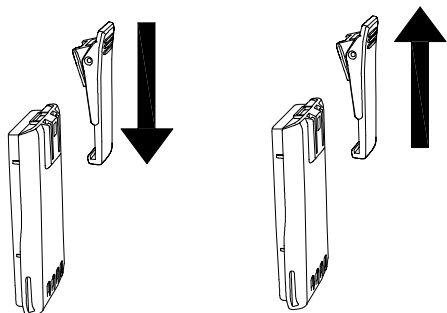
Getting Familiar

Radio Components

Channel Knob

Power/Volume Knob

Antenna

Indicator
(Red light at TX/Orange light at scanning/Green light at RX)

Speaker

Microphone

SK1
(Programmable Key)

PTT

SK2
(Programmable Key)

Belt Clip

MIC/SP/PC Jack
(Connecting microphone or external USB programmable cable)

Battery
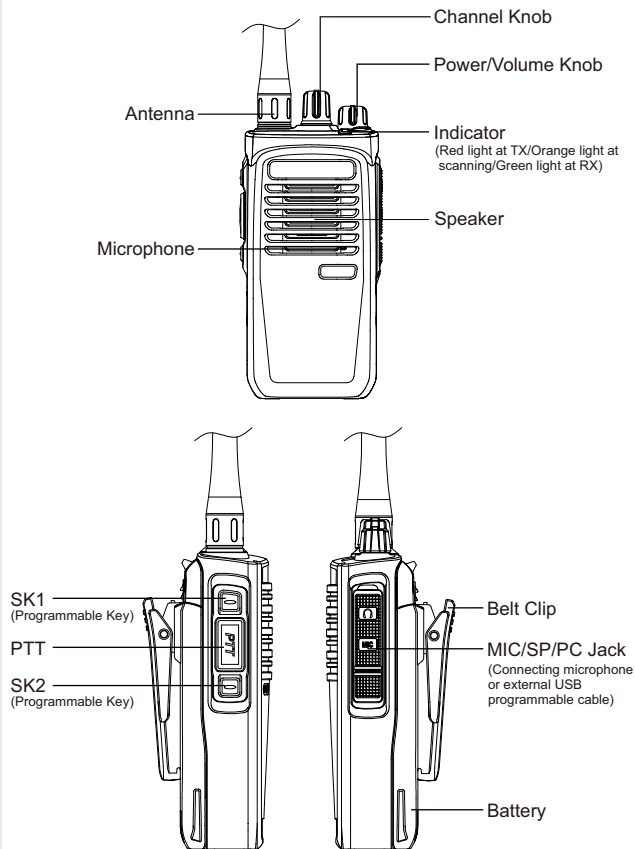
LED Indicator

The LED indicator light on the top of the radio lets you know its current states easily.

Indicator Status	Mode
Red light keeps on	Transmit
Green light keeps on	Receive
Red and green lights flash quickly	Scan
Red light flash slowly	Low power
Green light keeps on	Firmware update
Green light flash slowly	Base band update

Digital Mode

Wide/Narrow Band Selection

The digital channel only one band of 12.5kHz.

Receive Calling

In the digital channel, only when you receiving the matching color code and ID can hear the calling from transmitter.

One Touch Access

The function of "One Touch Access" allows users to easily perform operations such as call, kill, activation, remote monitoring, call prompt and decoding on predefined contacts. If the preset programmable key of radio is set to "One Touch Access", press it can make the radio perform the function.

Remote Monitoring (Only suitable for the private call contacts)

The radio has a "Remote Monitoring" function, which lets users monitor the voice activity around the receiver if it does not respond within the expected time.

Color Code

It is the unique function of digital channel, ensures that the call will not be heard by third parties. When the color code of transmitter and receiver are the same that can communicate.

Kill (Only suitable for the private call contacts)

The function can remotely turn off the radio's RX and TX feature by sending the kill code.

When the radio which has set the "Kill" function receives the code, it will enter to the killed mode. Only after receiving the activation code, the radio can restore to the normal work.

There are two kill types as following:
1. Disable the TX
2. Disable the TX and RX

Admit Criteria: CH Free

If you enable this function, when the channel is being used by other radio, press the PTT key will not transmit and it will make a warning tone. Only when this channel doesn't receive the signal, press the PTT key again that can transmit. The function can be set independently on each channel.

Admit Criteria: Always

If you enable this function, when the channel is being used by other radio, press the PTT key can transmit normally. The function can be set independently on each channel.

CH Voice Announcement (Can select the "Tone" or "Mute")

The radio has the function of "CH Voice Announcement". You can turn off the "CH Voice Announcement" by programming software.

Contacts

You can set the "Contacts" which in the "Digital Contact" according to your need by programming software. When working in the digital mode, the radio can talk to the current contact that your selection.

Calling System

You can preset a "Contact" for each digital channel by programming software, this "Contact" can be "Private Call", "Group Call" or "All Call".

Call Hold

It is the unique function of digital channel, after both parties end the call, press the PTT key during the call hold time, it can call back to talk. Otherwise, if you press the PTT key outside the call hold time, the radio will make a call to the currently binding contact. The specific time can be set by programming software.

Analog Mode

Bandwidth Selection

The "Bandwidth" can be set by programming software. You can choose the bandwidth of "12.5kHz or 25kHz" in the analog channel.

TX

The radio can set CTCSS/DCS encode and decode on the analog channel by programming software. When the settings of other radios are the same as it, it can receive the calling from others; Otherwise, it will not receive the calling from other radios. If the channel you selected is not set this function, you can hear the sound from other radio which using the same frequency.

RX

1. Select the channel that you need by rotating the channel knob.

2. Make sure that the PTT key is released and listen the calling.

3. When the radio receives a calling, the LED indicator will keep on green light.

4. If want to answer it, hold the radio, let it is in a vertical position and 1 to 2 inches (2.5 to 5.0 cm) away from the mouth. Press the PTT key to speak, release the PTT key to listen. If you want to establish proper two-way communication, the settings of two radios need the same. Which depend on the preset configuration file on the radio:

A. **Channel**: The channel that the radio is using, depends on the model of the radio.

B. **Frequency**: The frequency that the radio uses to transmit/receive.

C. **Bandwidth**: Some frequencies have optional channel spacing. If two radios want to communicate, the bandwidth setting of them must be the same to get the best sound quality.

Tail Elimination (Non-QT/DQT Turn-off Freq)

If this function is set on the radio, you will not hear a sound of "CA" caused by the end of the call and the disappearance of the carrier, which protects you from the noise shock, the default value is "None".

Note: Only the analog channel that has this function.
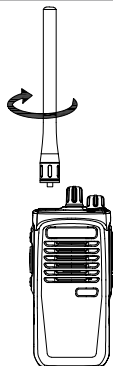
CH Voice Announcement (Can select the "Tone" or "Mute")

The radio has the function of "CH Voice Announcement". You can turn off the "CH Voice Announcement" by programming software.

Basic Operation

Preparation Steps

As described above, please install the fully charged battery to the radio.

Screw the attached antenna into the antenna jack. We don't recommend you operate the radio without antenna. And if you have the earpieces, we suggest you connect it after you are familiar with the basic operation of the radio.

Quick start

Clockwise rotate the (Power/Volume) knob to turn on the radio.

Rotate the "Channel Knob" to select the channel that you need, If you have enabled the function of "CH Voice Announcement" by programming software, the radio will announce the channel number when rotating the channel.

Rotate the "Power/Volume Knob" to adjust the volume. If there is no signal appearing on the analog channel, press the "Monitor" key you will hear the noise of background. Press it again, the radio will block the noise and restore to the normal status of reception.
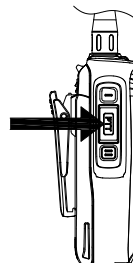
To transmit a signal, the radio needs to monitor the channel first to ensure that the channel is free. Press the PTT key and speak to the microphone at normal volume, if want to return to the reception status, please release the PTT key.

The radio can activate a preset programmable function by SK1 or SK2 key. And you can set the function according to you need by programming software.
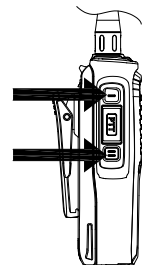
The radio supports two types of dual time slot. The first dual time slot mode is "Repeater Slot"; The second is DCDM, this mode doesn't require a repeater. If in the "DCDM", the two groups of call in one frequency can be made at the same time, which will let the communication efficiency doubled. The dual time slot function can ensure the communication smooth at the peak of service.

If the selected channel has enabled the function of TOT, it will limit the duration of each transmission. When the red LED light ("TX" indicator) is "Off", the transmission ends. If you need re-transmit, please release the PTT key, wait for the end of the "forbidden time".

If the radio has set the "Admit Criteria (Channel Free)" in the analog channel, it will not TX when there is carrier in the channel and make a short beep tone. Release the PTT key, wait for no signal and transmit again.

If the radio has set the" Admit Criteria (Correct CTCSS/DCS)" in the analog channel or set the "Admit Criteria (Color Code)" in the digital channel, it only can TX when the analog channel receives the carrier with the correct CTCSS/DCS or the digital channel receives the carrier with correct color code.

Function Operation

Programmable Key Function:

Users can set the function of SK1, SK2 according to their needs by programming software.

SK1/SK2: Defined programmable key (can be set long/short press function)

Function	Programmable Key (short press/long press)	
	SK1	SK2
Unassigned (default)	__/	__/
All Alert Tones On/Off	__/	__/
Emergency On	__/	__/
Emergency Off	__/	__/
High/Low Power	__/	__/
Monitor	__/	__/
Nuisance Delete	__/	__/
One Touch Access 1	__/	__/
One Touch Access 2	__/	__/
One Touch Access 3	__/	__/
One Touch Access 4	__/	__/
One Touch Access 5	__/	__/
One Touch Access 6	__/	__/
Repeater/Talkaround	__/	__/
Scan On/Off	__/	__/

Function	Programmable Key (short press/long press)	
	SK1	SK2
Tight/Normal Squelch	__/	__/
VOX On/Off	__/	__/
Zone Toggle	__/	__/
Battery Indicator	__/	__/
Regularly Remind On/Off	__/	__/
Record On/Off	__/	__/
Delete All Record	__/	__/
Record Playback	__/	__/
Companding	__/	__/
Main Channel	__/	__/
Noise Reduction (Optional function)	__/	__/

One-touch Access function as below:

1	None
2	Analog ---DTMF Signaling System (DTMF Side Tone, Kill, Active) ---DTMF Signaling Encode
3	Digital---Contact---Call/Message---Message

■ Transmit

Analog TX: Press the PTT key, speak into the microphone in normal voice.

Digital TX: The radio can set each channel to the "Digital Channel".

Press the PTT key will active the microphone, which allows the radio to transmit the signals to others to talk. When release the PTT key, you can hear the signals.

Release the PTT key, when the "Talk End Tone" is making, means that the call ends, you can press the PTT key again to transmit a new call (select one of channels or preset key of the "One-touch Access").

Note: The function of "Talk End Tone"" need to be ticked.

During the call, if the radio enables the function of "CH Free Indication Tone" (can be set by programming software), when the target radio releases the PTT key, you will hear a short prompt tone, which means the channel is free and waiting for your reply.

If the call is interrupted (such as when the radio receives a emergency call), you will hear the CH free indication tone. And you can turn off the "CH Free Indication Tone" by disabling all tones.

During the call, if the radio enables the function of "Color Code" (can be set by programming software), only the receiver sets the same color code as the transmitter that can receive the calling.

■ Receive and Launch Call

1. Select Zone

The zone is a channel group. The radio supports up to 4 zones, and each zone supports up to 16 channels.

A. Press the side key, which has been set to "Zone Toggle".

B. You will hear a sound of "Zone 2", indicates that the radio has switched from the Zone 1 to Zone 2.

2. Select the Radio's Channel, User ID or Group Call ID

After the channel area that you need has been set, you can select the channel, user ID or group call ID by rotating the channel knob.

3. Receive and Reply the Calling

When the channel, user ID or group call ID has been set, you can receive and reply the calling.

When receive the correct calling (matching number: private call, group call, all call), the radio will start receiving, open the speaker and can hear the incoming voice.

Private Call

The "Private Call" is a half-duplex call that between a calling party and a called party (one to one). If the call type in the "Contact" is "Private Call", it will implement the function of private call. In the pre-set time, press the PTT key can send the callback.

Group Call

When receiving the calling from user group, the radio must be configured to belong to the group call.

17

All Call

The "All Call" is a call made by the calling party's radio to all the radios on the channel. It is used to make important announcements that require special attention from users.

When receiving the private call/group call/all call:

A. The LED indicator lights on green.

B. Hold the radio, let it is in a vertical position and 1 to 2 inches (2.5 to 5.0 cm) away from the mouth. If the radio enables the function of "CH Free Indication Tone", when the transmitter releases the PTT key, you will hear a short prompt tone, which means the channel is free and waiting for your reply.

C. Press the PTT key to reply the calling, the LED indicator lights on red.

D. If the "Talk Permit Tone" is enabled, you can speak clearly into the microphone after the tone.

E. Release the PTT key to listen.

F. If there are no voice activities within the scheduled time, the calling will terminate.

⚠ **NOTE:**

You cannot reply the "All Call". If there are no any voice activities during the scheduled time, the "All Call" will terminate. When receiving the "All Call", if you switch the channel to another one, the radio will stop receiving the "All Call". And during the "All Call" period, you will not use any preset program-mable key until the calling ends.

18

4. Launch the Call

You can use the following way to select a channel, user ID or group call ID:

A. Channel Knob.

B. The preset programmable key of "One Touch Access".

5. Launch the Call by Channel Knob

Each digital channel can be configured with a "Contact"; This "Contact" can set the desired call type and ID, as the called party when launching.

A. Select the channel or person that you want to call by rotating the channel knob. The "Call Type" (Private Call, Group Call or All Call) depends on the contact that you selected for the channel.

B. Hold the radio, let it is in a vertical position and 1 to 2 inches (2.5 to 5.0 cm) away from the mouth.

C. Press the PTT key to launch a call, the LED indicator lights on red.

D. If the "Talk Permit Tone" is enabled, you can speak clearly into the microphone after the tone.

E. Release the PTT key to listen, when receive the target radio's reply, the LED indicator lights on green.

F. If the radio enables the function of "CH Free Indication Tone", when the target radio releases the PTT key, you will hear a short prompt tone, which means the channel is free and waiting for your reply. Press the PTT key to answer, or if there are no any voice activities during the scheduled time, the calling will terminate.

G. When the "Private Call" ends, you will hear a short prompt tone.

6. Launch the Group Call or Private Call by "One Touch Access" Key

The function of "One Touch Access" allows you to easily launch a group call or private call to the predefined ID or contact, this function can be assigned to the short /long press programmable key. You can assign an ID or a preset contact to a "One Touch Access" key, the radio has multiple programmed "One Touch Access" key.

A. Press the preset programmable key of "One Touch Access" to initiate a group call or private call to the predefined ID or the current contact.

B. Hold the radio, let it is in a vertical position and 1 to 2 inches (2.5 to 5.0 cm) away from the mouth.

C. Press the PTT key to launch the call, the LED indicator lights on red.

D. If the "Talk Permit Tone" is enabled, you can speak clearly into the microphone after the tone.

E. Release the PTT key to listen, when receive the target radio's reply, the LED indicator lights on green.

F. If the radio enables the function of "CH Free Indication Tone", when the target radio releases the PTT key, you will hear a short prompt tone, which means the channel is free and waiting for your reply. Press the PTT key to answer, or if there are no any voice activities during the scheduled time, the calling will terminate.

G. When the "Private Call" ends, you will hear a short prompt tone.

■ Digit Emergency System

1. Alarm Type (Can be set by the programming software)

Turn on/off the emergency mode by preset programmable key.

A. **Disable:** Turn off the emergency alarm function, the radio will not enable emergency alarm, but it can receive the emergency calling from other radios.

B. **Regular:** The radio makes an alarm tone, it is continuously playing for a while (can be set by programming software), the alarm tone and alarm identification code will be sent to the receiver.

C. **Silent:** The radio does not make an alarm, but it will send an alarm identification code, the receiver can receive the alarm.

D. **Silent w/Voice (Silent with Voice):** After the alarm is enabled, press the PTT key to launch a call, it will play a sound.

2. Regularly Remind (Work Alone)

Turn on/off this function by preset programmable key, the purpose is to ensure the safety of the owner when the radio works alone. If the radio is in the work alone mode, it will make a tone to remind the user after setting the time. At this time, you need to press the key to indicate that you are in the safe state, otherwise the radio will be in the automatic alarm mode.

■ Scan (Can turn on/off this function by preset progra-mmable key)

1. Scan List

Create the scan list and assign it to the single channel/group call. The radio will check for whether there is voice activity in the current channel by looping scan the channel/group call in the list. It supports up to 250 scan lists.

2. Scan

When the radio has enabled the function of "Scan", it will check for whether there is voice activity in the current channel by looping the preset scan list.

The LED indicator flashes alternately between red and green.

Main Channel Scan (Manual): The radio will scan all of channels/group calls in the scan list. When enter to the scanning, according to different settings, the radio can automatically start scanning from the last scanned "active" channel/group call or the channel which scanning is enabled.

3. Nuisance Delete

When the scanning stops, press the preset programmable key of "Nuisance Delete" can move on to scan the next channel, and the deleted channel will not be scanned again. However, when you restart the scan function after exiting it, the deleted channel can be scanned again.

4. Enable and Stop Scanning

A. Press the preset programmable key of "Scan", or select a channel that can automatically enable the scan function by rotating the channel knob.

B. When the scan function is enabled, the LED indicator will flash alternately between red and green, you will hear a confirmation tone. Or when the scan function stops, the LED indicator lights off, you will hear a negative tone.

5. Priority Channel Scanning

When the radio sets the "Priority Channel", which allows to enable the priority scan function. The mode of priority scan uses cyclic way, when scanning every ordinary channel, the priority channel also will be scanned.

6. Scan Reply

The radio will stop and stay on the channel/group call which detected an activity. This is called the preset time limit of "scan hang time".

A. Hold the radio, let it is in a vertical position and 1 to 2 inches (2.5 to 5.0 cm) away from the mouth. If the radio enables the function of "CH Free Indication Tone", when the transmitter releases the PTT key, you will hear a short prompt tone, which means the channel is free and waiting for your reply.

B. During the "scan hang time", press the PTT key, the LED indicator lights on red.

C. If the "Talk Permit Tone" is enabled, you can speak clearly into the microphone after the tone.

D. Release the PTT key to listen.

E. If you don't respond in the "scan hang time", the radio will scan other channels/group calls.

■ Setting

1. Set the "Squelch Level"

You can adjust the radio's normal squelch level, filter out the channel with low signal strength or the channel with higher background noise than preset squelch level.

Each channel allows setting a squelch level of 1-9; When set the preset programmable key to "Tight/Normal Squelch", the "Normal Squelch" indicates that the preset squelch level of the current channel, the "Tight Squelch" indicates that the preset squelch level of the current channel is increased by 2 levels (If the default is level 1, the tight squelch is level 3).

A. Press the preset programmable key of "Tight/Normal Squelch".

B. You will hear a confirmation tone, indicates that the radio is in the tight squelch, or you will hear a negative tone, indicates that the radio is in the normal squelch.

2. Set the Power Level

You can set the power level of each channel to "High/Low".

A. Press the preset programmable key of "High/Low Power"

B. You will hear a prompt tone of low power, indicate that the radio transmits in low power, or you will hear a prompt tone of high power, indicate that the radio transmits in high power.

3. Turn On/Off VOX

The VOX function allows you to initiate hands-free voice calls on programmed channels. Turn on the VOX function on the accessory (with VOX), whenever the microphone on the accessory detects voice, the radio will automatically transmit a signal in the programmed time.

Press the PTT key when operating the radio, it will disable the VOX function.

⚠ **NOTE:**

Only the radio activates the VOX function that can enable or disable the function.

A. Press the preset programmable key of "VOX On/Off" to turn on/off the function.

B. If the "Talk Permit Tone" is enabled, you can use the touch key to initiate a call and speak clearly into the microphone.

4. Turn On/Off the Radio Tone

If necessary, you can enable or disable the all tones of radio (the emergency tone is excluded)

A. Press the preset programmable key of "All Alert Tones On/Off".

B. You will hear a confirmation tone, indicates that the all tones have been turned on, or you will hear a negative tone, indicates that the all alert tones have been turned off.

5. Check the Battery Power

You can check the remaining power of the battery.

Press the preset programmable key of "Battery Indicator", check the battery level by prompt tone. When the battery power is low, it will make a tone of "low power"; when the battery power is middle, it will make a tone of "middle power"; when the battery power is high, it will make a tone of "high power".

■ DTMF Signaling Setting

There are 4 DTMF receive/transmit signaling system (can be set by programming software), 32 sets decodes can be set, each group can set 30 characters.

Decode

The called party can set the "Decode Response Type" by programming software.

Kill: When the radio receives the "Kill" code, it will be prohibited receiving/transmitting.

Active: The radio is in the killed status, but it will restore to the normal status when receiving the "Active" code.

■ Encrypted List

The type of "Encrypted list" can be selected to "ARC4/AES128/AES 256". The radio can set one encryption type, if you want to decode the encrypted call or date transmission, the receiver needs to set the same "encryption key" and "encryption type" as the transmitter (suitable for encrypted list).

If your radio receives the privacy calls that with different encryption keys or different key values and key IDs, as well as different type of privacy calls, you will hear the voice of transmission confusion (encrypted list).

Optional Function

■ Record
Record On/Off

Press (or hold down) the specified programmable key to turn on/off the recording function, then the radio can record the content of calling.

Record Playback

Press (or hold down) the specified programmable key to turn on the "Record Playback" function, then the radio can playback the content of calling.

After the calling of radio ends, if you want to playback the recording, wait 3s before operating it.

Delete All Record

Press (or hold down) the specified programmable key to turn on the "Delete All Record" function, then the radio can delete all the content of calling.

■ Noise Reduction

Press (or hold down) the specified programmable key to turn on/off the "Noise Reduction" function, then the radio can reduce the noise of the call content.

Warranty Card

Contact: _____

Company Name: _____

ADD:_____ Post Code: _____

Tel: _____ Mob: _____

Fax:_____ E-mail: _____

Purchasing: _____ Model No: _____

Serial No: _____ Purchase Date: _____

(S/N):_____ (EAN): _____

Warranty card No: _____

Trouble Description: _____

Note: This warranty card is an important certificate for the end user to enjoy the warranty service. And it must be stamped and filled in by the authorized dealer to be valid. Please keep it properly.

Warranty Terms

The warranty period of the product is calculated from the date of sale (according to the date on the sales invoice).

The warranty period of radio is one year, the battery or charger is 6 months, and earphone or other accessories are 3 months.

The warranty will not be covered under the following conditions：
1. Warranty card and purchase invoice cannot be presented.
2. The warranty card has altered or is inconsistent with the product.
3. Defect or damage caused by abnormal or unconventional use of the product.
4. Defect or damage caused by wrong use, accident, water or negligence.
5. Defect or damage caused by wrong test, operation, maintenance, installation, refit, adjustment etc.
6. Defect or damage caused by unauthorized maintenance, disassembly etc.
7. Defects or damage caused by irresistible factors
8. Have the abrasion in normal use.

The final interpretation belongs to Fujian Juston Electronic Equipment Company.