

BelFone

www.belfone.com



BF -TM8500

DMR digital FM transceiver model

User Notification

Government law prohibits the operation of unlicensed radio transmitters within the territories under government control.

Illegal operation is punishable by fine or imprisonment or both.

THANK YOU

We are grateful you choose BelFone series professional radio communications products!

Since 1989, in order to lead the market, BelFone has been always engaging in research and exploration of radio communications technologies. We make every effort to research and design products according to modern complicated communications environment, and offer complete and customized communication solutions to clients. Our products will satisfy you due to its excellent performance and outstanding communications. No matter what field you are in, you will be satisfied with the radio.

DMR digital FM transceiver model: BF-TM8500

Warning!

- ◆ In explosive atmospheres (inflammable gas, dust particles, powder-covered, etc.), please turn the power off.
- ◆ Do not carry spare fuel containers in the trunk of your vehicle if your transceiver is mounted in the trunk area.
- ◆ Various electronic equipment in your vehicle may malfunction if they are not properly protected from the radio frequency energy which is present while transmitting. If your vehicle contains such equipment, consult the dealer for aid in determining if they will perform normally while transmitting.

Precautions

It's important that the operator is aware of and understands hazards common to the operation of any radio. following safety precautions to prevent radio damage or personal injury during operation, service and repair of this radio.

- ◆The usage rate recommended is 1 minute for TX and 4 minutes for RX, when the radio is used for transmission for long time, the radiator and chassis will be hot.
- ◆Do not place the transceiver under direct sunlight for a long time, in extreme warm, damp, dusty areas, and on uneven surface.
- ◆If warning signals are released when use the radio, please obey the rule and turn off the transceiver.
- ◆Please avoid to use the radio while driving, which may be against the traffic rules.
- ◆If you notice any problems of the radio, please turn it off firstly. Then contact with local dealer. Do not service/ repair this radio unless instructed by this manual or refer it to qualified or licensed technicians only.
- ◆If you want to use the machine for secondary development, please contact with BelFone' s technical engineer or dealer for technical assistance.
- ◆Please keep radio surface clean and dry, wipe it by cloth moistened with clean water and mild dishwashing liquid.

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Supplied Accessories

Notes: The accessories listed below are covered by BelFone dealer, authorized agents or factories.

After carefully unpacking the transceiver, please confirm the items listed in the table below. If any items are missing or damaged during shipment, please contact with dealer immediately.

Accessories

items	Quantity
Microphone	1
Mounting bracket	1
Microphone hanger	1
DC power cable	1
Screws	2
Fuse	1
Instruction Manual	1
Warranty Card	1
Certificate	1

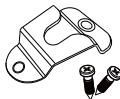
Microphone



Mounting bracket



Microphone hanger



DC Power Cable



Screws



Fuse



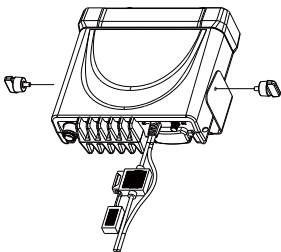
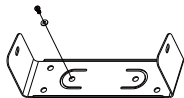
Notes: Use accessories only specified by BelFone.

Installation of Accessories

Mobile Transceiver Installation

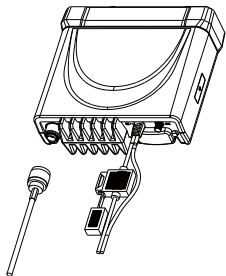
To install the transceiver, select a safe, convenient location inside your vehicle that minimizes danger to your passengers and yourself while the vehicle is in motion. Try to choose the location which is well-ventilated and shielded from direct sunlight.

Install the mounting bracket in the vehicle using the supplied self-tapping screws. Ensure that all hardware is tightened; please use specified Mounting bracket and screws to install.



Antenna Installation

Before operating, you must install an efficient, well-tuned antenna first. The success of your installation will depend largely on the type of antenna and its correct installation. The Transceiver performance will be affected by antenna system and its installation quality. The antenna for a base station shall be set in a high ground without obstacles around; the antenna for transceiver is suitable for installing in the center of the car roof; the higher antenna will gain better coverage.



Notes:

◆Use a low-loss coaxial feed line that also has a impedance of 50Ω , to match the transceiver input impedance. Coupling the antenna to the transceiver via feed lines having an impedance other than 50Ω reduces the efficiency of the antenna system and damage transceiver.

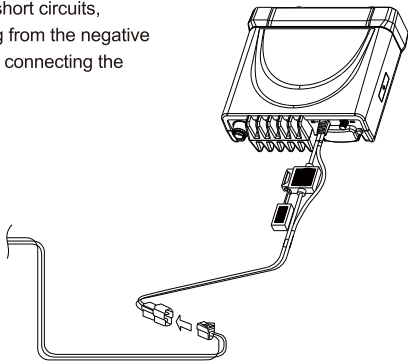
◆Transmitting without connected antenna or other matched load may damage the transceiver. Always connect the antenna to the transceiver before transmitting.

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

Power Cable Connection

Be sure to use a 12 V vehicle battery that has sufficient current capacity. If the current capacity to the transceiver is insufficient, the transmit output power may drop excessively and generate warning tone. Never connect the transceiver to a 24 V battery. If necessary to connect the transceiver to 24V power please select a specified DC-DC battery.

To prevent the risk of short circuits, disconnect other wiring from the negative battery terminal before connecting the transceiver.



Notes:

◆ This transceiver is designed for a 13.8 V power source. Never use a 24 V battery to power the transceiver. Before installed the device, please check the correct polarity and the voltage of the battery. Pay attention to connect and cut off the battery as following:

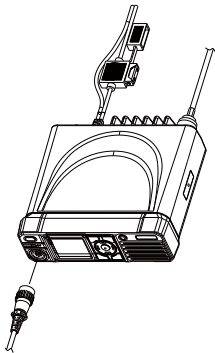
◆ Using specified transceiver power cable to connect battery terminals; red connects to the positive (+) terminal and black connects to the negative (-) terminal, be carefully to prevent the risk of short circuits during connecting.

◆ Confirm the correct and security of the connections, then turn on the power to operate.

◆ Do not remove the fuse holders from the cable, otherwise the incorrect connection may lead to the device get smoke.

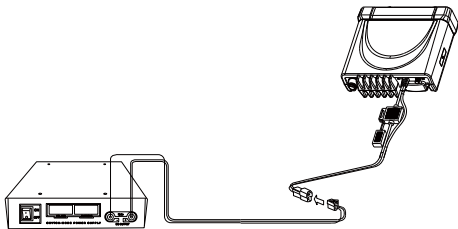
Microphone Installation

Put the grooves of the hand microphone plug on the top and insert it into the microphone interface of the mobile, please press down a little bit until the locking tab clicks. To pull microphone away from transceiver, pull the head of microphone latch out.



Fixed Station Installation

In order to use this transceiver for fixed station operation, you will need a separate 13.8 V DC power supply (not included in the accessories). The recommended current capacity of your power supply is 15 A or more. The power supply and fixed station can be placed on work table; also you can install it on wall by suitable bracket.



◆ Before finished all connections, Please don't directly connect the transceiver to an AC outlet.

◆ Ensure transceiver and DC power are cut off.

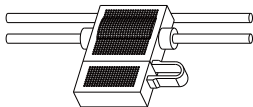
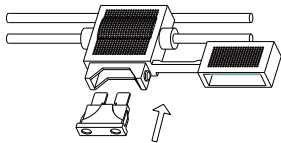
◆ Connect the transceiver's DC power connector to the connector on the DC power cable and confirm the correct polarity of the connections. (Red: positive, Black: negative).

◆ Press the connectors firmly together until the locking tab clicks.

Note: For your transceiver to fully exhibit its performance capabilities, we recommend using the Belfone specified power supply.

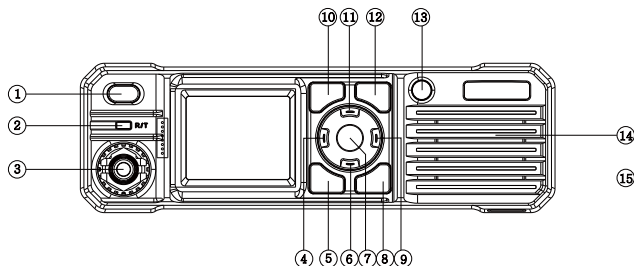
Replacing Fuses

If the fuse blows, determine the cause, then correct the problem. After the problem is resolved, replace the fuse. If newly installed fuses continue to blow, disconnect the power cable and contact your authorized dealer or an authorized service center for assistance.



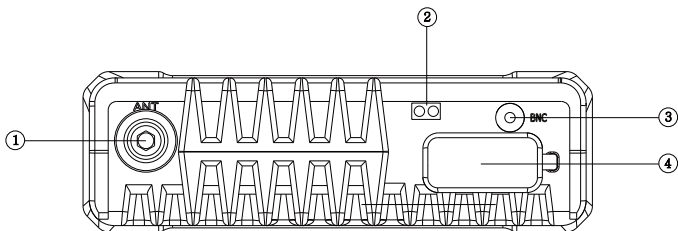
Getting Acquainted

Front panel



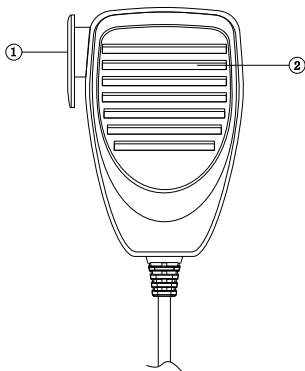
①	Power switch key: short press to turn power on, long press to turn power off.	⑧	Programmable Key F4
②	LED Indicator	⑨	Right Key: Short press to select a channel, long press to select a zone.
③	Microphone Jack	⑩	Programmable Key F1
④	Left Key: Short press to select a channel, long press to select a zone	⑪	Up Key: Short press to increase the volume level or long press to increase the volume level quickly.
⑤	Programmable Key F3	⑫	Programmable Key F2
⑥	Down Key: Short press to decrease the volume level or long press to decrease the volume level quickly.	⑬	Orange Key: Short pres to enable the emergency feature, Long press to disable the emergency feature.
⑦	OK Key: Press to confirm or go to Menu	⑭	Speaker

Rear Panel

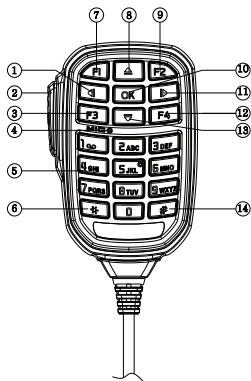


①	ANT: Connect an external antenna or a dummy load to this terminal
②	DC 13.8V: Connect to 13.8 V DC power.
③	BNC: Connect to GPS antenna
④	PC Jack: Connect to PC

Standard Microphone



Optional Microphone



Standard Microphone



























①	PTT Key
②	Microphone (MIC)

Optional Microphone


①	Left Key	⑧	Up Key
②	PTT Key	⑨	Programmable Key F2
③	Programmable Key F3	⑩	OK Key
④	Microphone (MIC)	⑪	Right Key
⑤	Numeric key	⑫	Programmable Key F4
⑥	* Key: To delete	⑬	DOWN Key
⑦	Programmable Key F1	⑭	#Key

Basic Operation

LCD Icons

	Signal Strength		Connect to PC
H/M/M/L	High / Middle2/ Middle1/ Low Power		Connect to Bluetooth earphone
	Digital Mode		Direct /Talk around Mode
	Analog Mode		Fail to send message
	Analog compatible digital mode		Message sent successfully
	Digital compatible analog mode		Read Message
	Private Call		Unread Message
	Group Call		Missed Call
	All Call		Mute all
	Scan On/		Emergency
	Roam		Recording normally(Black Icon)
			Recording abnormally(Red Icon)
	Location On		Connect to App
	Keypad Locked		Enable Monitoring

Turning the power on off

Short press the power switch key  to turn on the radio, an audio voice prompts the current channel number;

Long press the power switch key  about 3 seconds to turn off the radio.

Adjusting the volume

Increase the volume by pressing [UP Key]; Decrease the volume by pressing [DOWN Key].

Selecting a Channel

Press [Left Key] or [DOWN key] to select a channel. There will be voice prompt for channel switch.

Selecting a Zone

The radio supports up to 64 zones, each with a maximum of 16 channels, 50 zones all support up to 160 channels via programming software. Select the required zone on the menu and there will be voice prompt after successfully switch the channel. Or Long press [Left Key] or [Right Key] to select a zone.

Dual Modes Switching

If current channel mode is D/A compatible, press side button **【AD Switch】** function to switch the channel mode. The current channel mode is digital compatible analog , press **【AD Switch】** button to switch to analog compatible digital mode; the current channel mode is analog compatible digital, press **【AD Switch】** button to switch to digital compatible analog mode.

Note: AD Switch function only switching the channel mode temporarily, while you restart the radio or rotate channel selector knob, the current channel will resume defaulting mode.

Call

In digital mode, you can transmit a private call, group call or all call. In dual band mode, in analog mode, press PTT key to transmit directly; On analog compatible digital channel press PTT key, if is not within hang time to transmit analog call, within the hang time to call back; On digital compatible analog channel press PTT key, if is not within hang time to initiate a digital call, within hang time to call back. To transmit hold the radio vertically 3 to 4cm from your mouth, speak a normal tone of voice and the LED lights up red means transmitting.

Private Call

If the feature "private call ACK" is enabled, to transmit a private call need to confirm whether it is power on or activate on the current channel.

(1) If a private call ID in current digital channel has been defaulted, press PTT key to call.

(2) You can select the private call from address book and press PTT key to call.

(3) Enter Contacts menu and go to manual dial menu or press programmed "Manual Dial" key, input a private call number you want to call, then press PTT key to transmit;

(4) You can select the private call from the missed/received/called out records and PTT key to call.

(5) You can set the One Touch Call button as private call, then press programmed button to transmit a private call.

Group Call

(1) If the group call ID in current digital channel has been defaulted, press PTT key to call.

(2) You can select group call from address book and press PTT button to call.

(3) You can select the group call from the called out records and PTT key to call.

(4) You can set the One Touch Access button as group call, then press programmed key to transmit a group call.

All Call

(1) If the all call ID in current digital channel has been defaulted, press PTT button to call.

(2) You can select all call from address book and press PTT button to call.

Receiving and calling back

While a call is received on current channel, LED indicator glows green. While a group or private call is received, you may press the PTT key within the preset time period to call back. On compatible channel, while receiving, the radio detect digital and analog signal (is must attach to CTCSS/CDCSS) simultaneously, if detected matching signal, within the preset time period to call back.

Button Setting

For enhanced convenience, you may program the buttons F1, F2, F3, F4, Orange button, short and long press of a key to be defined as different functions.

No	Name	Description
1	Undefined	Not assigned with any function
2	On Touch Call 1-6	In digital mode, to make group call/ private call/call alert or send defaulted SMS quickly , in analog mode, to make a signaling call.
3	Manual dial	Quickly to input the private call number for calling
4	Emergency On	To send emergency information, only set as short press
5	Emergency Off	To exit emergency mode, only set as long press
6	Monitor	To enable or disable monitor function quickly
7	Backlight On/Off	Quick switch backlight mode.
8	Keypad Lock	To lock or unlock the keypad quickly
9	Scan On/Off	To enable or disable scan function quickly
10	All Alert Tones On/Off	To enable or disable all tones quickly
11	Short Message	Quick access to short message
12	Zone Toggle	Quick access to [Zone Toggle]
13	GPS On/Off	To enable or disable GPS quickly
14	Priority Interrupt	To cut the call on current channel forcibly
15	AD Switch	To temporarily switch channel mode to AD or DA
16	Address List	Quick access to [Address List] menu
17	Radio Enable	Quick access to [Radio Enable] menu
18	Radio Disable	Quick access to [Radio Disable] menu
19	Radio Check	Quick access to [Radio Check] menu
20	Remote Monitor	Quick access to [Remote Monitor] menu
21	High/Middle2/ Middle1/Low Power	To switch High/ Middle2/ Middle1/Low Power quickly
22	Repeater/Talkaround	To enable or disable talk around quickly

23	Nuisance Delete	To temporarily ignore unwanted channel activity
24	Permanent Monitor	To enable or disable permanent monitor function
25	Record On/Off	To enable or disable record quickly
26	Site Lock on/off	Quick to lock current site
27	Manual Site Roam	Quick to roam to next available site
28	VFO/MR Switch	Quick to switch channel display mode
29	Bluetooth Write On/Off	Quick to enable or disable the Bluetooth Write feature.
30	Bluetooth Audio On/Off	Quick to enable or disable the Bluetooth Audio feature.

Functions and Operations

Contacts

On the contacts menu, you can view the all contacts, add new contacts or manual dialing.

1. Group Call ()

While the contacts type as group call, you can select the menu to view its ID or send message.

2. Private Call ()

While select a contact as private call, a private call can view its detail, edit name or ID, delete, send message, send call alert, send device check, send remote monitor, disable or enable.

Feature	Description
Call Alert	To send an alert to private contact and remind other person to call back
Device Check	Allow you check if the target radio is active on the current channel while doesn't send any tone alert to the target device.
Remote Monitor	Allow you to send a "Remote Monitor" request to the target device via menu. If the request is successful, you can enable the microphone of the target radio, and monitor its activities.
Device Enable	Allow you to send "Device enable" command to the target killed device, to allow it to be used normally.
Device Disable	Allow you to remotely disable another radio, the radio become unable to operation except receiving enable command, or re-program via the programming software to enable it.

3. All Call ()

While the contacts type as all call, you can select the menu to view its ID or press PTT to call.

4. Manual Dial

You can manually input the private call number for calling or sending call alert , send message, device check, remote monitor, device enable, device disable.

5. New Contact

You can add a private call contact to the contact list. When edit name, press[*] key to delete, press [#] to switch input method, name input 16 characters at most; then input number, the available number range is 1~16776415. After add a private call contact successfully, contacts list will show new contact.

Scan

1. Scan On/Off

While current channel add scan list and the list contains 2 channels at least, you may enable the feature. Your radio cycles through the programmed scan list for the current channel looking for voice activity (Analog and digital channel are supported). The LED blinks red during scanning, and will stop on a channel where activity is detected. If you don't want to receive calls on the channel, press the programmed [Nuisance Delete] key to temporarily remove the unwanted channel from the scan list. To exit scanning process, you can turn off in scan menu, switch channel or press the programmed [Scan On/Off] key.

Note:

If the channel enables the feature “Auto Scan” via the programming software, switch to the channel will enter scanning automatically;
While programmable key as Scan on/off, press it to enable scan feature.

2. View/Edit List

Users can view the members, add or delete channels by editing a scan list. The list is with a maximum of 16 members. It is not allowed to create a new scan list or delete existing scan lists from the device. Digital and analog channel will be appeared in the same scan list.

Zone



The radio supports up to 64 zones, each of zone supports 16 channels, totally 1024 channels supported. Enter “Zone” menu to select a desired zone.

SMS

1. New SMS

You can edit desired text message(140 characters at most) and send it to an private call contact or group call contact, when editing a message, press “#”key for switching input method, press “*” key for deletion and modification, press up or down key to switch input cursor. For non-numeric input method, key “1” is a symbol key. Key “0” is a space key. After the message is edited, you can select a contact from the address list which the message is sent to or manually dial a number to send to.

2. Inbox



The Inbox can save up to 50 received messages. The unread message displays:  , read message displays:  , you can reply, forward or delete them.

3. Preset SMS

User can save 10 common preset text messages with maximum of 140 characters via programming software.

Note: Preset text messages also can assign to one touch call, and press the programmed key to send messages.

4. Outbox

Enter outbox menu, you can view the message is sent successfully or failed, outbox can save up to 50 messages. If message is sent successfully, it will display  while  appears if failed. You can resend, forward and delete.

5. Delete All

This function is convenient to delete all messages in inbox or outbox, Clear All will delete all messages in Inbox and Outbox at the same time, but the preset messages can't be deleted.

Call Logs

1. Missed Call

The missed calls list can save up to 50 entries, user can view the details or press PTT key to call back, and can add it to contact list or delete it.

2. Answered Calls

The answered calls list can save up to 50 entries private call, user can view the details or press PTT key to transmit, , and can add it to contact list or delete it.

3. Outgoing Calls

The outgoing calls list can save up to 50 entries private call, user can view the details or press PTT key to transmit, and can add it to contact list or delete it.

4. Clear Record

This function is convenient to delete Missed call logs Answered or Outgoing call logs; Clear All will delete all call logs at the same time.

Settings

1. Settings

Basic settings to meet customers' needs

2. Answered Calls

Talk Around: When your repeater malfunctions, or when radio is out of repeater's range, you can continue to communicate in talk around mode. While enable talk around feature, the screen displays: **HA**, By this time TX frequency the same as to RX frequency. If switch channel, enable scan feature or restart radio will disable the feature.

Note: To enable this function, TX frequency should be different from RX frequency, and the channel will set as allow talk around on the programming software.


Press the programmed Talk Around key to switch DM mode and RM mode.

Tone/Alerts: To set tones for your radio, tone alerts include settings of all tones, call alert tone, message tone and keypad tone. If disable all tones, all alerts will be off except emergency tone.

TX Power: Allow a user to change the power level, there are three levels available: high (indicated by **H**), middle2 (indicated by **M**), middle1 (indicated by **M**) and lower (indicated by **L**)

Backlight: To set the backlight parameters, you can select ON or AUTOMATIC, while you select AUTOMATIC, the light will become dark after 5 second you don't operate the key, and the light will keep on all the time when the backlight is ON.

Boot Interface: Allow a user to enable or disable the boot screen via menu. If the BOOT INTERFACE is enabled, while the radio power on, the screen will display BelFone Logo.


Keypad Lock: Allow a user to enable or disable keypad lock via menu. While Keypad locked indicate: , press [OK] +[#] key to unlock.

LED Indication: To set whether to enable LED indication via menu, all indicators including TX/RX indicator, scanning/roaming indicator, keypad indicator. If disable LED indicator, the screen becomes dark, please use this function with cautiously.

Power-on Password: If enable power-on password feature via programming software, you can modify the password by this menu. First you need input old password correctly, then input a new password twice the same, that will modify the password successfully.



Note: This menu is effective if power on password is set via programming software.

GPS Switch: To enable or disable the GPS feature, while GPS on indicate by: 

VR Configure: While enable voice recording feature, there are 2 Rec modes available: compress or uncompress, while recording on indicate by: 

RTC Configure: This option allows you to set the current date, time. Press * key to delete then re-input, and press [OK] key to confirm.

U Disk Mode: If stored voice memo into transceiver memory, it allows you switch to U-Disk mode, the voice memos can be downloaded to PC to play, restart your radio to exit U-Disk mode.

BT Mode: If the radio supports Bluetooth feature, it allows user to switch BT mode as CPS mode or Audio Mode. While the radio works on CPS mode indicated by: , and the radio works on audio mode indicated by: .

BT Connection Manager: This function is only available under BT Audio Mode, enter BT Connection Manager menu to search device and view the connected device information.

Theme Choose: It allows user to choose the screen displaying style, there are 4 themes available: Default Theme, Light Yellow, Light Blue and Light Green

2. System Info

With this option, you can view the basic information of your radio, including My Number, Firmware Version, CP Version, Hardware Version, Voice Record Version, GPS Data, BT Info and Send GPS Data.

3. Channel Configure

Channel configure function is used to modify the current channel parameters, on digital channel; it allows you to modify RX/TX frequency, channel name, TOT, TX contact, CC index, choose slot, RX group list; on analog channel to modify RX/TX frequency, channel name, TOT, CTCSS/CDCSS.

Note: While finish the parameters modification, please return to home screen to save the setting, then all modified data is effective.

Digital Emergency Operation/ Alarm

You are able to initiate an Emergency at any time on any screen display. The radio supports three Emergency Alarms types and three emergency modes.

Emergency Type:

Regular: Radio transmits an alarm signal and shows audio and visual indicators.

Silent: Radio transmits an alarm signal without any audio or visual indicators.

Silent with Voice: Radio transmits an alarm signal without any audio or visual indicators, but allows incoming calls.


Emergency Mode:

Alarm: In this mode, you can send alarm information, while receive ACK or reach the maximum retries and then exit emergency mode.

Alarm with Call: You can press programmed” Emergency On/Off” key to send emergency information, and then press PTT to transmit an emergency call.

Alarm with voice to follow: You can press programmed” Emergency On/Off” key to send emergency information, then you can speak into the microphone, allowing your voice and background noise be transmitted automatically as you do not to press PTT key.


1. Send Emergency Alarm

If emergency system has been added to current channel which is defined as reply channel also press orange key to send alarm, the LED blinks red and emergency icon  appears.

2. Exit Emergency Mode

The radio exits Emergency mode when one of the following occurs: Emergency Alarm acknowledgement is received; all retries to send the alarm have been exhausted; the receiver long presses the orange emergency key.

3. Receive Emergency Information

On receiving an emergency alarm, the emergency icon  appears, a tone sounds, and the radio displays the emergency caller alias. Long press the orange button to exit.


Analog Emergency Operation/ Alarm

On analogy channel with 5 tone signaling or DTMF signaling, you can transmit emergency information to others, the receiver will ring alarm tone. The analogy emergency type and mode are the same as digital emergency.

1. Send Emergency Alarm

On analog channel, if the alarm signaling type is set as 5-Tone or DTMF, short press orange key to send emergency signaling, and long press the orange key to exit emergency mode.

2. Receive Emergency Information

While receiving analog signal, the decode type of receiver is emergency call, after decoding successfully, the radio displays icon  and “Emergency receive”, an alarm tone will sound. To exit the emergency mode, long press orange key.

Alone Worker

This feature prompts an emergency if you can't press any button or send voice within limited time. The radio will alarm automatically to ask for help. Set work alone response and warn time via programming software to enable the feature.

Note: Alone Worker is an optional feature.

Positioning Service

The radio supports the BeiDou navigation satellite system, the GPS and both the GPS and BeiDou navigation satellite system. Via the programming software, you can select it.

●Enabling Position

1. Go to MenuSettingsSettingsLocation SwitchOn;
2. Press programmable key [Location On/Off];
3. Via the programming software to enable it.

●Viewing Position

1. Viewing the radio's position: Go to the MenuSettingsSystem InfoLocation Data; and then view the location information of your radio (including its data, time, longitude, latitude, speed, altitude, and number of visible satellites).

2. Viewing the contact's position: Go to the MenuSMSNew SMS, and inputting query command, and then send to target radio;

●Sending Position Message

To send your location information to a private contact by message: Go to MenuSettingsSystem InfoSend Location SMS

●Location Report

The location report feature allows the radio to report its location information to the control center. If you configure the GPS trigger via the programming software to allow the radio to report the location data automatically according to the preset connect counts or PTT counts.

Note: GPS Positioning is an optional feature.

Voice Recording

While activated voice recorder, it will continuously record all transmitted and received signals. There are 2 Rec modes available: compress or uncompress the compress mode can reduce memory but uncompress mode can make the quality of audio excellent. On Voice Records menu input date can view or play the voice memo. For 30 minutes recording a voice memo, the suffix of memo as 000 represents uncompress, 0001 represents compress. While terminal switches to U-Disk mode, the voice memos can be downloaded to PC to play.

Note: Voice recording is an optional feature.

Bluetooth Service

The Bluetooth feature allows the radio to read or write the data via APP and connect Bluetooth earpiece to make a conversation.


1. CPS Mode

Go to MenuSettingsSettingsBT ModeCPS Mode, to enable the CPS mode, when you use APP firstly, to perform the pairing and connection, if the APP connects to radio successfully, the radio displays: , the Bluetooth connection has been established.

Note: The pairing operation of the Bluetooth earpiece only for the first time using it, if the device restarts the Bluetooth will be connected automatically.

2. Audio Mode

Go to MenuSettingsSettingsBT ModeAudio Mode, to enable the audio mode, when you use Bluetooth earpiece firstly, to perform the pairing and connection. Do as follows:

1. Turn on the Bluetooth earpiece, the earpiece enter the pairing mode automatically, then LED indicator of earpiece flashes red and blue;
2. Press [OK] key to go to MENUSettingsSettingsBT Connection ManagerBT Search, on the device list, select the wireless device to be paired, when the radio displays icon: , the Bluetooth earpiece connection has been established. Then press PTT key on the earpiece to transmit audio signals.

Note: Bluetooth Service is an optional feature.

Voice Encryption

The voice encryption can encrypt your audio signals to guarantee the privacy of your communication. User can select encryption type as XOR, Enhanced XOR, ARC4 or AES256 in programming software. Only if encryption type and encryption key are the same, this function will be workable, or there will be no voice.

Note: This feature is effective on digital channel.

Dual Capacity Direct Mode

In TDMA direct mode, all radios in same group must communicate in same slot. Two communications paths at one frequency that is time slot 1 and slot 2, no interference between each other.

Note: This function is available only in digital mode.

Pseudo Trunk

While slot is set as pseudo trunk, and one time slot is already occupied, it can automatically switch into the free one. If the pseudo trunk TX time slot is set as none, both time slot 1 or time slot 2 can transmit; if the pseudo trunk TX time slot is set as 1, press PTT key to call only on time slot 1; if the pseudo trunk TX time slot is set as 2, press PTT key to call only on time slot 2. The TX time slot is invalid for replying, press PTT button to call on the slot which received signal.

Note: In order to guarantee the stability of communication, the transmitter and the receiver will enable pseudo trunk function at the same time.


Radio Priority-Based Interrupt

The call priority feature allows you to interrupt the on-going call on current forcibly, a preemptive call can interrupt other on-going calls with lower priority to release the channel for itself. There are 5 voice priorities available, level 0 is lower, level 3 is higher, and

emergency call is the highest. To transmit the Priority Interrupt command also can press the programmed [Priority Interrupt] key, in order to make the channel free for new call or message transmission.

Note: This function is available only in digital operation.

Roaming

Roaming is available in digital mode, thus to allow your radio to extend communication beyond a single site, by connecting to different available sites which are connected via an IP site connect system. Icon  appears when roaming is on while nothing shows if it is closed; and LED flashes red during searching. To enable/disable roam on the menu, set site lock or unlock, or start roam automatically.

Note: Each channel can only have either Scan or Roam enabled, not both at the same time.

Time Out Timer (TOT)

TOT prevents any user occupy a channel too long. If a channel is busy, the time will be shorter. If the preset time expires, the radio will generate beep and terminate transmission automatically.

TX Permission

Digital Channel

This feature can restrict the occupied channel from being unable to transmit. There are three options available: Always, Color code free, Channel free. If choose Always, whenever you press PTT key to transmit directly; If choose Color code free, you will be unable to transmit on the channel if the color code is already in use; If

Choose channel free, you will be unable to transmit on the channel if it is already in use. If the channel is busy, press PTT key and a warning tone will be sounded.

Analog Channel

This feature can restrict the channel if it is already in use you will be unable to transmit. There are three options available: off, carrier, CTCSS/CDCSS, if choose Off, whenever you press PTT key to transmit directly; If choose carrier, you will be unable to transmit on the channel if the channel is being used by others; If choose CTCSS/CDCSS, you will be unable to transmit on the channel if it is already in use and the CTCSS/CDCSS code in use. If the channel is busy, press PTT key and a warning tone will be sounded.

Analog Feature

On analog mode, the radio only supports four basic parts to operate, the menu including scan, zone, settings, Voice Records.

Squelch Level: On the analog mode, this feature allows you to adjust the squelch threshold required for the radio to un-mute. If two radios are at a close distance, the signals are strong, squelch level can be higher; If two radios are at a long distance, the signals are weak, squelch level can be lower. The appropriate squelch level depends on the ambient RF noise conditions. You can set SQL level as: 1 to 9, the default setting is level 3.

CTCSS/CDCSS: On analog channel, you can set unique CTCSS/CDCSS to guarantee the privacy of your communication, if CTCSS/CDCSS has been set CTCSS/CDCSS has been set on the current channel, CTCSS/CDCSS match is required for the radio to receive an incoming signal. You can select a CTCSS/CDCSS from CTCSS standard frequency table or CDCSS standard code table or input non standard values manually via the programming software.

- Decode: Only when receiver receives a call containing matching the decode, you can hear the call;

- Encode: Signal that you transmit will only be heard by parties whose CTCSS/CDCSS signaling matches your transceiver.

Note: On analog channel approves of non-standard code, you can manually input non-standard code as you need, on compatible channel, only can select a certain CTCSS/CDCSS from list.

Analog Signaling

2-Tone Signaling

2-Tone Contact

While users set 2-Tone signaling type for the current channel, the 2-tone contact supports a maximum of 32 2-Tone call list, on the menu of 2-Tone contact; you can select one of the contacts to send.

Send 2-Tone Signaling

On analog channel, press the programmed “one touch call” key to send 2-tone signaling, the radio displays:” 2-Tone Call Sending”.

Receive 2-Tone Signaling

Allow the user define the call type of the 2-tone system as “Call Prompt”, “Voice Call Prompt”, or “Selective Call”. While received signaling and match with decode format, the radio displays the call type and an alert tone will sound. And within the receiver’s resetting time the LED glows orange.

5-Tone Signaling

5-Tone Contact

While users set 5-Tone signaling type for the current channel, the 5-tone contact supports a maximum of 200 5-Tone call list, on the menu of 5-Tone contact, you can select one of the contacts to replace the address code of decoding sequence and encoding sequence.

Send 5-Tone Signaling

On analog channel with 5-Tone Signaling, press the programmed “one touch call” key to send 5-tone signaling, the radio display:”5 tone call sending”.

Receive 5-Tone Signaling

Allow the user define the call type of the 5-tone system as “Ordinary Call”, “Emergency Call”, “Kill”, “Activation”, “Silent Inquiry”, “ACK2 Authorize”. The decoding is successful while received signaling and match with decode type, and within the receiver’s resetting time the LED glows orange.

DTMF Signaling

DTMF Contact

While users set 5-Tone signaling type for the current channel, the contact list includes a total of 200 items. On the menu of DTMF contact, you can select one of the contacts to replace the address code of decoding sequence and encoding sequence.

Send DTMF Signaling

On analog channel, press the programmed “one touch call” key to send DTMF signaling, the radio display:”DTMF call sending”.

Receive DTMF Signaling

Allow the user define the call type of the DTMF system as “Ordinary Call”, “Emergency Call”, “Kill”, “Activation”, “Silent Inquiry”, “ACK2 Authorize” The decoding is successful while received signaling and match with decode type, and within the receiver’s resetting time the LED glows orange.replace the address code of decoding sequence and encoding sequence.

CTCSS Frequency Standard Table

CTCSS No.	Freq. [Hz]	CTCSS No.	Freq. [Hz]	CTCSS No.	Freq. [Hz]	CTCSS No.	Freq. [Hz]
1	No	14	100.0	27	156.7	40	196.6
2	67.0	15	103.5	28	159.8	41	199.5
3	69.3	16	107.2	29	162.2	42	203.5
4	71.9	17	110.9	30	165.5	43	206.5
5	74.4	18	114.8	31	167.9	44	210.7
6	77.0	19	118.8	32	171.3	45	218.1
7	79.7	20	123.0	33	173.8	46	225.7
8	82.5	21	127.3	34	177.3	47	229.1
9	85.4	22	131.8	35	179.9	48	233.6
10	88.5	23	136.5	36	183.5	49	241.8
11	91.5	24	141.3	37	186.2	50	250.3
12	94.8	25	146.2	38	189.9	51	254.1
13	97.4	26	151.4	39	192.8		

Note: In the table, thirty-nine standard CTCSS/CDCSS code of analog channel, twelve bold fonts are particular CTCSS/CDCSS code of compatible channel.

CTCSS Frequency Standard Table

CTCSS No.	Positive Code	Negative Code	CTCSS No.	Positive Code	Negative Code	CTCSS No.	Positive Code	Negative Code
1	D023N	D023I	29	D174N	D174I	57	D445N	D445I
2	D025N	D025I	30	D205N	D205I	58	D464N	D464N
3	D026N	D026I	31	D223N	D223I	59	D465N	D465N
4	D031N	D031I	32	D226N	D226I	60	D466N	D466I
5	D032N	D032I	33	D243N	D243I	61	D503N	D503I
6	D043N	D043I	34	D244N	D244I	62	D506N	D506I
7	D047N	D047I	35	D245N	D245I	63	D516N	D516I
8	D051N	D051I	36	D251N	D251I	64	D532N	D532I
9	D054N	D054I	37	D261N	D261I	65	D546N	D546I
10	D065N	D065I	38	D263N	D263I	66	D565N	D565I
11	D071N	D071I	39	D265N	D265I	67	D606N	D606I
12	D072N	D072I	40	D271N	D271I	68	D612N	D612I
13	D073N	D073I	41	D306N	D306I	69	D624N	D624I
14	D074N	D074I	42	D311N	D311I	70	D627N	D627I
15	D114N	D114I	43	D315N	D315I	71	D631N	D631I
16	D115N	D115I	44	D331N	D331I	72	D632N	D632I
17	D116N	D116I	45	D343N	D343I	73	D654N	D654I
18	D125N	D125I	46	D346N	D346I	74	D662N	D662I
19	D131N	D131I	47	D351N	D351I	75	D664N	D664I
20	D132N	D132I	48	D364N	D364I	76	D703N	D703I
21	D134N	D134I	49	D365N	D365I	77	D712N	D712I
22	D143N	D143I	50	D371N	D371I	78	D723N	D723I
23	D152N	D152I	51	D411N	D411I	79	D731N	D731N
24	D155N	D155I	52	D412N	D412I	80	D732N	D732N
25	D156N	D156I	53	D413N	D413I	81	D734N	D734I
26	D162N	D162I	54	D423N	D423I	82	D743N	D743I
27	D165N	D165I	55	D431N	D431I	83	D754N	D754I
28	D172N	D172I	56	D432N	D432I			

Specifications

General	
Frequency Range	VHF:150 MHz UHF:400 MHz
Channel Capacity	1024
Zones	64
Channel Spacing	12.5KHz/25KHz
Operating Voltage	DC 13.8 V ($\pm 20\%$)
Frequency Stability	$\pm 1.5\text{ppm}$
Antenna Impedance	50 Ω
Dimensions (L×W×H)	162 (L) *157(W)*51(H)mm
Weight	1300g
Transmitter	
RF Output Power	High Power: 45W Middle 2 Power: 25W Middle 1 Power: 20W Low Power: 10W
4FSK Modulation	12.5kHz Only Data: 7K60FXD 12,5kHz Data and Audio: 7K60FXE
FM Modulation	12.5 kHz: 8K50F3E; 25 kHz: 16K Φ F3E;
Modulation Limiting	+/- 2.5kHz @ 12.5kHz; +/- 5kHz @ 25kHz
FM Noise	-40dB
Conducted Emission	-36 dBm \leq 1GHz/-30 dBm \geq 1GHz
Adjacent Channel Power	$\leq -60\text{dB}$
Audio Response	+1/-3 dB
Audio Distortion	3%
Digital Voice coder Type	AMBE3000

Receiver	
Digital Sensitivity	5% BER: 0.25uV
Analog Sensitivity	0.25uV (12 dB SINAD)
Intermodulation	60 dB
Adjacent Channel Selectivity	60 dB
Spurious Response Rejection	60 dB
FM Noise	-40dB
Audio Response	+1/-3 dB
Audio Output Power	5W
Audio Distortion	3% (Typical)
Conducted Spurious Emission	-57dBm
GPS Accuracy	Horizontal Accuracy≤-10m (with well signal)
TTFF (Time To First Fix) Cold Start	< 1 Minute (with well signal)
TTFF (Time To First Fix) Hot Start	< 10 Second (with well signal)
Environmental Specifications	
Working Temperature	-20 C —+70 C
Storage Temperature	-30 C —+85 C

Statement

Our Company endeavors to achieve the accuracy and completeness of this manual, if you have any question, you can contact with us, we will make a detailed answer to you in time. All the above specifications and design are subject to change without prior notice due to continuous development.

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RECYCLABLE PACKAGING