

# BelFone

[www.belfone.com](http://www.belfone.com)



**BF-TD950**

**Digital FM Transceiver Model**



## Notice to the user

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.

## Thanks

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

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

**VHF/UHF digital FM transceiver model: BF-TD950**

## Warning!

◆ In explosive atmospheres (flammable gas, dust particles, much powder)

## Precautions

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

- ◆The recommended usage rate is 1 minute for TX and 4 minutes for RX,when the radio is used for transmission for many hours continuously, the radiator and chassis will become hot, allow the rear panel of the radio to contact surface of low melting point /low Ignition point object;
- ◆Don' t leave the transceiver in direct sunlight for a long time, don' t place the transceiver on extremely heat, damp, dusty area, and don' t put it on unstable surfaces;
- ◆When restriction or warnings are posted regarding the use of radio devices,please obey the regulation turn the transceiver power off;
- ◆Use of the radio while you are driving may be against traffic laws, please prohibit using it ;
- ◆If you notice any problems on the radio, please turn off at first. Then contact with local dealer. Do not modify this radio unless instructed by this manual or refer service to a qualified licensed or certified technician 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 the surface of radio is clean and dry, clean the radio using a cloth moistened with clean water and a mild dishwashing liquid.



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# 1. Supplied Accessories

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

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

## 1.1 Accessories

items	Number	Quantity
Antenna		1
Strap		1
Belt Clip		1
Charger		1
Li-ion Battery		1
Screws		1
User Manual		1
Warranty Card		1
Certificate		1

Antenna



Strap



Li-ion battery



Charger



Belt clip



Manual



## 2. Installation of Accessories

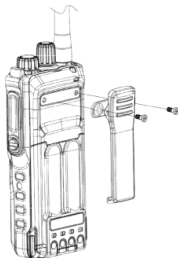
### 2.1 Installation/ Removing the Antenna

Hold the supplied antenna by its base, then screw it into the connector on the top panel of the radio until fasten. Turn the antenna anti-clockwise to remove it.



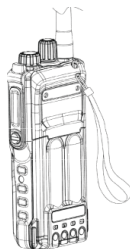
### 2.2 Installation/ Removing the Belt Clip

Attach the belt clip using the two supplied 3\*4mm binding screws.



### 2.3 Attaching/Removing the Strap

Thread the hand strap to the loop back of your two-way radio.

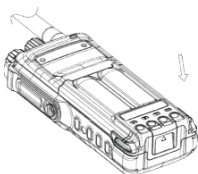


## 2.4 Attaching/Removing the Battery

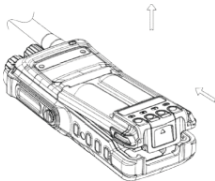
### Warning!

1. Don't short-circuit the battery, it may cause the battery damaged or burst into flame;
2. Never attempt to remove the casing from battery, that avoid to short the battery terminal;
3. Battery is flammable objects, don't throw it into fire or don't use it on dangerous area.

Match the guides of the battery with the corresponding grooves on the upper rear of the radio, and then press the battery until a click is heard to lock it in place.



To remove the battery, please turn the power off then press the release latch to unlock the battery pull the battery away from the radio.



**Note: Don't attach / remove the battery if the transceiver turned on.**

## 2.5 Battery Information

New battery is shipped not fully charged from the factory, please charge your battery before using it, charging a new battery for 5 hours before initial use. The maximum battery capacity and performance is achieved after three full charge/discharge cycles. If you notice the battery power runs lows, please recharge the battery.

### Applicable Battery

To reduce the risk of injury, please only use the battery and charger specified by Belfone, other batteries may burst, causing bodily injury and property damage.

### Battery Tips

1. When charging your battery, keep it at a temperature among 5C—40C. Temperature out of the limit may cause battery leakage or damage.
2. When charging a battery attached to a radio, turn the radio off to ensure a full charge.
3. Do not cut off the power supply or remove the battery when charging a battery.
4. Never charge a battery that is wet, please dry it with soft cloth prior to charge.
5. Even if the battery is full charged, the operating time is noticeably shorter than normal performance; it is time to buy a new battery.

### To Prolong Battery Life

1. Battery performance will be greatly decreased at a temperature below 0C, a spare battery is necessary in cold weather, the cold battery unable to work in this situation may work under room temperature, so keep it for later use.
2. The dust on the battery contact may cause battery breakdown, please use a clean dry cloth to wipe it before attaching the battery to the radio.

### Battery Storage

1. Fully charge a battery before you store it for a long time, to avoid battery damage due to over-discharge.
2. Recharge a battery after several months' storage, to avoid battery capacity

reduction due to over-discharge.(NI-MH batteries:3 months, Li-Ion& Li-polymer batteries: 6 months)

3. Store your battery in a cool, dry place under room temperature, to reduce self-discharge.

### **Charging the Battery**

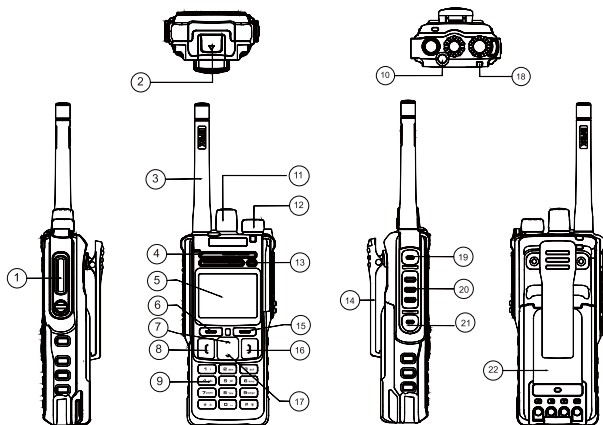
1. Plug the AC connector of the switching power into the AC outlet socket.
2. Place the battery or the radio is attached with a battery in the charger.
3. Making sure the battery is connected to the charger, the charging process initiates when the charger indicator glows red.
4. The charger indicator glows green when the battery is fully charged, please remove the battery then.

## **2.6 Attaching the Speaker/Microphone**

Anticlockwise loosen the screw on the accessory connector cover to uncover the connector, align the accessory plug with the connector and tighten the screw on the accessory plug.
































### 3. Getting Acquainted



1	Pin Connector	12	Power switch/volume adjust keys
2	Battery Clamp	13	Speaker Hole
3	Antenna	14	Belt Clip
4	Microphone	15	Back Key
5	LCD Display	16	P2 Key
6	MENU / OK Key	17	Down Key
7	UP Key	18	LED Indicator
8	P1 Key	19	SK1 Key
9	Numeric Keypad	20	PTT Key
10	TK Key	21	SK2 Key
11	Channel Selector Knob	22	Battery

## 4. Status Indication

### 4.1 LCD Icon

Icon	Status	Icon	Status
	Signal Strength		High TX Power
	No Signal		Middle TX Power
	An Accessory is connected		Low TX Power
	Clock is set		Scanning
	Low Battery Indication		Voice Alert On
	Battery Indication (Level 0 to 3)		Trunk Connected Inddication
	Bluetooth On		GPS On
	Bluetooth on and earphone is connected		GPS On and valid GPS data is received
	Call Divert Indication		Group Call
	Misseed Call		Private Call
	Emerrgency		All Call
	Encryption On		Call Aleert Contacts
	Mute Inddication		PSTN/PAABX Contacts
	Duplex Mode	<b>DM</b>	Direct Mode
	Inbox is full	<b>RM</b>	Repeater Mode
	Unread message	<b>TM</b>	Trunking Mode



## 4.2 LED Indicator

LED Lamp	Radio Status
The LED Indicator flash green slowly	Standby on trunking mode
The LED Indicator glows green	Receiving
The LED Indicator glows red	Transmitting
The LED Indicator glows orange	Scanning/Local Emergency
The LED Indicator flash orange quickly	Establishing a FOACSU private call
The LED Indicator flash orange slowly	Low Battery Alert

## 5. Basic Operation

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### 5.1 Power On/Off

Rotate the power switch/volume adjusting keys clockwise to turn the power on.

Rotate the power switch/volume adjusting keys anti-clockwise to turn the power off.

### 5.2 Adjusting the volume

- **Adjusting the voice volume**

After the radio is power on, you can rotate the power switch/volume adjust keys to adjust the volume level, rotate the knob clockwise to increase the volume, or rotate the knob anti-clockwise to decrease the volume.

- **Adjusting the prompt tone volume**

Via the programming software or enter Menu mode also can set volume level, you can select level 1 to level 3 or mute.

## 5.3 Modes Switching

Enter Menu mode and select “Modes” menu, all modes are: DMO mode, TMO mode, MPT mode, on conventional, the radio displays: DM or RM; on trunking mode, the radio displays: TM.

### 5.3.1 Conventional Mode

#### 1. Selecting a Channel

Turn the channel selector knob to select channel, rotate the knob clockwise to increase the channel number, or rotate the knob anti-clockwise to decrease the channel number. If the knob is polarity, you can enable channel voice boardcast feature, handover channel will hear a channel number; if the knob is non-polarity, and switch channel the radio will give a low-pitched tone indication.

**Note: When the knob is polarity, a channel is not programmed, the display appears: Un-programmed Channel and gives a long-pitched tone.**

#### 2. Selecting a zone

The radio supports up to 64 zones, 64 zones all support up to 1024 channels,when the knob is polarity, a zone with a maximum of 16 channels.You may select a desire zone through enter zone menu or press program med key [zone handover] then switch zone.

### 5.3.2 Trunking Mode

On trunking mode, the radio will start scanning automatically when powering on, after registering successfully, you can make an audio or data powering on, after registering successfully, you can make an audio or data communication.

#### 1. Registration

When power on the radio will start scanning automatically and determines whether the base station allows it to register. During scanning, thhe radio displays: Scanning...with the icon , and LED indicator glows orange, after registering successfully, the radio will display: Connected or We aken.

#### 2. Selecting a Group

In trunking mode, rotate the channel selector knob to select channel,


you may select a group or ID mode.

## 5.4 Channel Indication

In conventional mode, the radio displays "D" indicates digital channel, "R-D" indicates TalkAround channel, "A" indicates analog channel, "A-C" indicates analog channel attach with signals.

## 5.5 Using the Keypad

You can input user alias, call numbers and messages via the keypad of the radio.

·To switch input method: 

·To input special characters: 

·To input space: 

## 5.6 Locking and Unlocking Keypad

When the keypad is not in use, you can lock the keypad to avoid mishandling; you can lock or unlock the keypad through programming software or [Setting] menu.

### ● Auto Keypad Lock

Press [MENU/OK] key then go to "Settings" ->Basic Settings->Keypad Lock->On/Off, you can select "Off" or "Automatically". If enable keypad lock feature, the keypad will be locked automatically if there is no radio operation within the preset time.

### ● One Touch Lock Screen

Press programmed [One Touch Lock Screen] key to lock or unlock the keypad, press [MENU/OK] key and then press [\*] key to unlock keypad.

## 5.7 Call

To ensure optimal volume of the receiving radio, keep the microphone about 3 to 4 centimeters away from your mouth when transmitting. On digital channel or trunking mode, you can initiate a private call, a

group call or an all call.

### **5.7.1 Group Call**

#### **Initiating a group call**

##### **● Conventional Mode**

1. If you preset a group call contact for current digital channel, press PTT key to transmit a group call;
2. Enter Contacts menu to select the group call number you want to call, then press PTT key to transmit a group call;
3. Input a number you want to call directly then press [MENU/OK] key to switch to group, then press PTT key to transmit;
4. You can set the One Touch Call key as group call feature, then press programmed key to transmit a group call.

##### Trunking Mode

1. On group mode, press PTT key to initiate the group call;
2. Press [MENU/OK] key to select a group call contact, then press PTT key to transmit;
3. Input group call number then press PTT key to transmit;
4. You can set the One Touch Call key as group call feature, then press programmed key to transmit a group call.

#### **Ending a Group Call**

In conventional mode, if neither party holds down the PTT key to transmit before the group call hang up time expires the group call will be terminated. In trunking mode, if the transmitter hangs up the call, press programmed [Disconnect Switch] key, the group call duration exceeds the time preset or the base station signal is lost the group call will be terminated.

### **5.7.2 Private Call**

#### **Initiating a private call**

##### **● Conventional Mode**

1. If you preset a private call contact for current digital channel, press PTT key to transmit a private call;
2. Press [MENU/OK] key to select a private call contact, then press PTT key to transmit;
3. Input a number you want to call directly then press PTT key to

transmit;

4. You can set the One Touch Call key as group call feature, then press programmed key to transmit a group call.
5. Enter Call Log menu to select the private call number you want to call, then press PTT key to transmit a private call;

- **Trunking Mode**

1. Press [MENU/OK] key to select a private call contact, then press PTT key to transmit;
2. Input a number you want to call directly then press PTT key to transmit;
3. You can set the One Touch Call key as private call feature, then press programmed key to transmit a private call.
4. Enter Call Log menu to select the private call number you want to call, then press PTT key to transmit a private call;

### **Ending a Private Call**

In conventional mode, if neither party holds down the PTT key to transmit before the private call hang up time expires the group call will be terminated. In trunking mode, if the transmitter hangs up the call, press programmed [Disconnect Switch] key, the group call duration exceeds the time preset or the base station signal is lost the group call will be terminated.

### **5.7.3 All Call**

#### **Initiating an all call**

- **Conventional Mode**

1. If you preset an all call contact for current digital channel, press PTT key to transmit an all call;
2. Press [MENU/OK] key to select an all call contact, then press PTT key to transmit;
3. Input ID: 16777215 directly then presses PTT key to transmit;
4. You can set the One Touch Call key as all call features, then press programmed key to transmit an all call.

- **Trunking Mode**

In the home screen, input an all call number using the keypad, then press PTT key to transmit, the radio must be authorized that allows to

make all call.

**All Call in System:** In the home screen, input \*1987 using the keypad then press PTT key to initiate all call;

**All Call in Region:** In the home screen, input \*1977 using the keypad then press PTT key to initiate all call;

**All Call in Station:** In the home screen, input \*1957 using the keypad then press PTT key to initiate all call;

**All Call in Area:** In the home screen, input \*1967 using the keypad then press PTT key to initiate all call;

**Home Zone All Call:** In the home screen, input \*1917 using the keypad then press PTT key to initiate all call;

**Custom Group Call:** In the home screen, input \*1947 using the keypad then press PTT key to initiate all call;

### **Ending a all call**

In conventional mode, the transmitter release PTT key the all call will be terminated.

In trunking mode, if the transmitter hangs up the call, press programmed [Disconnect Switch] key, the group call duration exceeds the time preset or the base station signal is lost the all call will be terminated.

### **5.7.4 Broadcast Group Call**

During a broadcast group call, only the calling party can talk while the called party can receive voice only. The radio can make a broadcast group call if the radio is authorized by programming software and trunking system. In the home screen, input \*11\*+ Group Call ID using the keypad then press PTT key or [#] key to initiate a broadcast call.



**Note: Generally the all call is broadcast group call.**

### **5.7.5 Include Call**

An include call is a special group call initiated to another group during the call hang time of an outgoing group call, and the invited group joins the outgoing call. The radio can initiate the include call only after being authorized via the programming software.




## 5.7.6 Emergency Call

### ● Conventional Mode

On digital channel, in case of emergency, you can press [TK] key to initiate an emergency call. The emergency type as Normal, the emergency mode as: Alarm and Call, Alarm and Voice, Only Call, after initiating an emergency, you can make an emergency call, the radio displays:  , while you received emergency call, the radio also displays: .

### ● Trunking Mode

In trunking mode, you can initiate a private emergency call, group emergency call, all emergency call.

- ① Input private call number, group call number or all call number using the keypad, then press [[OK] key and select the call type as Emergency Call.
- ② Input \*9\*+Call ID using the keypad then press [PTT] key to transmit an emergency. (For Example: \*9\*80020900)
- ③ Press  key enter root menu, select [Contacts] -> [Contacts List] -> [Private Call] to select the required private call contact and press [Select] key to select "Emergency Call", press [PTT] to initiate a emergency call.
- ④ Press  key enter root menu, then go to [Call Logs] and select a required call contact, then press [Select] key to initiate an emergency call.
- ⑤ Press  key to enter recent Calls then select required contacts, press [Select] key to initiate an emergency call.

**Note: while initiated a emergency call in system, you can input:**




**“\*1982” then press [PTT] key.**

ect] key to initiate an emergency call.

## 5.7.8 Telephone Call

A telephone call is a call between a radio and a phone, if a repeater is connected to a PSTN/PPABX gateway and joins the PSTN/PABBX system, the radio can communicate with the phone through the repeater.

### **Initiating a telephone call**

1. Press [MENU/OK] key select "Contacts" -> "Contacts List" -> "Private Call"->PSTN or PABX contacts, then  press key or [PTT] key to transmit.
2. In the home screen, input the PSTN/PABX number using the keypad, then  press key or [PTT] key to transmit.
3. Press [MENU/OK] key and select "Call Logs" ->Recent Calls/Outgoing Calls/Incoming Calls/Missed Calls to select PSTN/PABX contacts, then  press key or [PTT] key to transmit.

### **Ending a call**

During communication, if the transmitter hangs up the call, press programmed [Disconnect Switch] key, the group call duration exceeds the time preset or the base station signal is lost the telephone call will be terminated.

### **5.7.9 Call on analog channel**

#### **● Call without Signaling**

On an analog channel without signaling, you can initiate a call to all the other users on the channel. Select a required channel then press and hold the PTT key to transmit.

#### **● Call with Signaling**

On an analog channel with signaling, you can initiate a call to a specific contact on the channel, the signaling type including: HDC1200, 5-Tone, 2-Tone. Via the programming software, you can set decoding and encoding of signaling. Press[MENU/OK] key then select "Contacts" ->"Contacts List" ->select a required contact press [PTT] key to initiate a call or press [One Touch Call 1~5]to transmit, the transceiver set up with signaling can communication with other transceivers that have been set up with signaling.

### **5.8 Buttons Setting**

For enhanced convenience, you may program the keys TK, SK1, SK2, short and Long press of a key can be assigned with different functions.

**Programmable keys are including functions listed below:**



<b>NO</b>	<b>Name</b>	<b>Description</b>
1	None	Not assigned with any function
2	Power Adjust	To switch High/Middle/Low Power quickly
3	Secret Hangover	To enable or disable encryption.
4	Zone Hangover	Quick switch a zone
5	Emergency Alarm On	To send emergency information
6	Emergency Alarm On	To exit emergency mode
7	Disconnect Switch	On trunking mode, quick to end talking.
8	Monitor On/Off	On conventional mode, to enable or disable monitor feature.
9	Group Talk Group Scan	On conventional mode, to enable or disable scan feature.
10	Talk Log	Quick access to [Call Logs] menu
11	Short Message	Quick access to [Message] menu
12	Covert Mode	On conventional mode, to enable or disable hide feature.
13	Call Remind	On conventional mode, quick to send call alert command
14	Mode Switch	Quick access to [Modes] menu
15	One Touch Call1~5	to quick transmit group call/ private call/ preset SMS;
16	Multi-Site Handover	On trunking mode, to enable or disable handover feature.
17	Background Hunt	On trunking mode, to enable or disable background hunt feature.
18	Single/Duplex Switch	On trunking mode, quick to switch to duplex mode or single mode.
19	Emergency Call	On trunking mode, quick to initiate an emergency call.
20	Squelch Level	On analog channel or MPT channel mode, to quick to access [Squelch] menu.
21	One Touch lock screen	Quick to lock or unlock keypad
22	View Local Info	Quick to view radio information.
23	View Network Info	On trunking mode, quick to view network information.
24	Talkaround Switch	On conventional mode, quick to enable or disable talkaround feature
25	Manual Dial Switch	Quick to enable or disable manual dial feature
26	Alert Tone Switch	Quick to enable or disable alert tone
27	Voice Broadcast Switch	Quick to enable or disable voice broadcast feature
28	GPS Switch	Quick to enable or disable GPS feature.
29	Bluetooth Switch	Quick to enable or disable Bluetooth feature
30	Notify Switch	On trunking mode, quick to enable or disable unwanted call feature.
31	Callback Switch	On trunking mode, quick to enable or disable callback feature.

## 5.9 One Touch Call

The One Touch Call feature allows you to press programmed key number “0~9”, “\*” key, “#” key and one touch call 1 to 5 to quick access a service assigned through the programming software. On the analog channel, you can make a call to a 2-Tone or 5-Tone or HDC1200 contact; on the digital channel, you can initiate a

group/private/all call or send a quick text to a private/ group contact; In trunking mode, you can make a group/private/all, and send a quick text or status message.

## 6. Functions and Operations

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### 6.1 Contacts

#### Contacts List

In the “Contact List” menu, you can view, edit or delete the private contact, on trunking mode, also you can send message or initiate an emergency call. For group call contacts, allows you to view.

#### New Contacts

New contact is used to add a new contact to the contact list, press [MENU/OK]key to select “Contacts” ->”New Contact”, then edit number and alias, After add a private call contact successfully, on contacts list will show new contact.

#### Note:

- The number and alias of a new contact must be unique with the contacts list.
- Except for adding a new contact, you can also save the numbers from call logs into the contacts list.

#### Search

Press [MENU/OK] key and select “Contacts”->Search, then select by number or by alias to search, input the keyword then press [MENU/OK] key to search qualified contacts.

### 6.2 Message

1. Press [MENU/OK] key and select “Message”->New Messages, to edit text message;
2. Finish inputting then press [MENU/OK] key.
3. You can save the text message to Drafts or send it to a private call

or a group call contact directly.

4. Select the contact or input the contact number manually.
5. Press [MENU/OK] key to send the message.
6. When the message is sent successfully, the radio will display the prompt "Send OK!"



**Note: On trunking mode, short messages can contain a maximum of 23 characters; long messages can contain a maximum of 128 characters.**

#### **Quick Text**

Quick Text is the frequently used message, via programming software, user can save 30 entries text messages, you can send the quick text directly or edit this text before sending it.

1. Press [MENU/OK] key to select "Message" -> "Quick Text" to enter quick text message;
2. Finish inputting then press [MENU/OK] key.
3. You can save the text message to Drafts or send it to a private call contact or a group call contact directly.
4. Select the contact or input the contact number manually.
5. Press [MENU/OK] key to send the message.
6. When the message is sent successfully, the radio will display the prompt "Send OK!"

#### **Inbox**

The Inbox can save up to 50 received messages. In the unread message display: , read message displays:  . For each message, you can choose to perform any of these operations:  Reply, Forward, Edit and Delete.

#### **Outbox**

Outbox can save up to 50 sent messages, for each message, you can choose to send (the text message is not sent successfully), forward, edit or delete it.

## **6.3 Status Messages**

In trunking mode, the radio supports status message, you can receive and transmit status code. You can add status message

through programming software.

**Note: The status code 0~31 is special for MPT trunking mode.**

### **Sending Status Message**

1. Press [MENU/OK] key and select "Status Message" ->Quick Text, to select target status message;
2. Press [MENU/OK] key to enter the "Contacts", you can select target contact from contacts list or input ID manually;
3. Press [MENU/OK] key to send the selected status message.

**Note: The code and quick text of transmitter must be agreed on with receiver, otherwise the radio only can receive the code.**

## **6.4 Settings**

### **6.4.1 Basic Setting**

#### **● Power Level**

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

#### **● Backlights**

The feature is designed to illuminate the LCD and the keypad, you can enable or disable the backlight of LCD and keypad respectively.

#### **● Keypad Lock**

Allow a user to set keypad lock on/off and auto-lock time, while keypad is set as automatic, if no operation or activity is performed with the preset period the keypad lock automatically. To unlock press [MENU] key and [\*] key.

#### **● Password**

To set power on password, via the programming software you can enable or disable password feature, and you can modify the radio password.



#### **● LED**

Turn on or off the LEED indication, the LED including: Scan Status LED, Standby LED, Emergenncy LED, Tx/Rx LED, if disable LED indication the radio status with no LED indication.

### ● **Date & Time**

This feature allows you to set the time and data display, the radio displays the time as HH:MM, D/M on the home screen.

### ● **Bluetooth**

To enable or disable the Bluetooth, when it is enabled, the radio will display: . If the Bluetooth connects to Bluetooth earpiece successfully, the radio will display: .


### ● **Hide Mode**

On conventional mode, you can enable or disable hide feature, when it is enabled the radio will turn all visible and audible indications off.

### ● **Call Divert**

The Call Divert feature allows you to divert an incoming call to a designated radio. The divert type including: all, only call, group data or message data.

### ● **Half/Full Duplex**

On trunking mode, to switch communication mode as half duplex or full duplex, if it is on full duplex mode, the radio displays: .

### ● **Encryption**

To enable or disable encryption feature, if enable encryption feature, the radio displays icon: .

### ● **Lone Work**

To enable or disable Lone Work feature

### ● **Vocoder**

To set the type of vocoder, you can select the vocoder as AMBE++ or NVOC.

### ● **Man Down**

To enable or disable Man Down feature

### ● **MIC/SPK Settings**

**Mic AGC:** To turn on or off the Mic AGC feature, the feature allows the radio automatically keep the microphone gain within a proper range during transmission.

**Volume Control:** To set the speaker volume control as Strong or Standard.

## ● Tone &Vibrate

To set tones and vibration feature for your radio, you can set the following tones:

<b>Alert Tones</b>	<b>Description</b>
Keypad Tones	To set whether the radio will give tone indication when press key.
Switch Function Tones	To set whether the radio will give tone indication when switching function.
Power On Tones	To set whether the radio will give tone indication when power on.
Power Off Tones	To set whether the radio will give tone indication when power off.
Alarm Tones	To set whether the radio will give tone indication when transmitting or receiving emergency.
Low Battery Tones	To set whether the radio will give tone indication when the radio battery gets low.
Call Answered Tones	To set whether the radio will give tone indication when the radio answering a call.
Call Ended Tones	To set whether the radio will give tone indication when the radio ending receives voice.
Forbidden Tones	To set whether the radio will give tone indication when the radio forbidding transmission.
Operation Failed Tones	To set whether the radio will give tone indication when the radio operations failed.
Clock Tones	To set whether the radio will give tone indication when the clock is reminding.
PTT Release Tones	To set whether the radio will give tone indication when the radio release PTT key.
RX Message Tones	To set whether the radio will give tone indication when the radio receiving a message.
Success/Query Tones	To set whether the radio will give tone indication when the radio appears success or query frame.
Error Tones	To set whether the radio will give tone indication when the radio operation error.
Call Wait Tones	To set whether the radio will give tone indication when the channel is busy.
Missed Call Tones	To set whether the radio will give tone indication when the radio received missed call.

**Vibration:** To enable or disable vibration feature, if it is enabled, the radio will vibrate for an incoming private call, a new message or a call alert.

**Sounds/Vibration:** The available options include: Ring, Vibration Only, and Vibration on Ring.

**Volume Level:** To set the volume level of alert tone, the available options include: mute, level 1, level2, level 3.

## 6.5 Call Logs

**Outgoing Call:** The outgoing calls list can save up to 50 entries private call, user can view the details of the outgoing call log, save the call number to Contacts, send message, make a emergency call or press PTT key to transmit.

**Incoming Call:** The incoming calls list can save up to 50 entries private call, user can view the details of the incoming call log, save the call number to Contacts, send message, make a emergency call or press PTT key to transmit.

**Missed Call:** The missed calls list can save up to 50 entries private call, user can view the details of the missed call log, save the call number to Contacts, send message, make a emergency call or press PTT key to transmit.

## 6.6 Scan


### 6.6.1 Conventional Mode

On conventional mode, the Scan feature allows you to listen to activities on other channels of scan list, the scan list contains 2 channels and 1 relevant group scan list at least, and you may enable the scan feature. During scanning, when detecting group call activities on channel, the radio stay on it to receive group call, and you can press PTT key to answer the group call if "talkback" feature is checked via the programming software.

#### ● Scan On

1. Press [MENU/OK] key to select "Scan" ->Option ->Group Scan -> On/Off, to enable scanning feature;

2. Press programmed [Group Talk Group Scan] key to enable scanning feature.

With the feature enabled, the radio reaches the scan list preset for the current channel, the LED indicator glows orange, and the LCD displays icon: .

- **Setting Scan List**

The scan list contains at most 32 channels for radio to scan, to delete or add a channel, press [MENU/OK] key and select "Scan" ->Scan List, and select required scan list.

### 6.6.2 Trunking Mode

In trunking mode, you can set scan mode to guarantee the radio registers with a base station quickly.

- **Scan Mode**

Before registering, the radio automatically scanning through the control channels for available base stations, you can adopt either of the two scan plans: fixed trunking station control channel (Fixed TSCC) and flexible trunking station control channel (Flexible TSCC). There are two search modes of Fixed TSCC: All channel or control channel table.

**All Channel Scanning:** The radio scans all the channels within the preset frequency range.

**Control Channel Table Scanning:** The radio scans the fixed TSCC in the defined control channel table.

- **Enable handover/background/home station scanning**

The radio can enable the following scan modes after registration to ensure a seamless communication:

Mode	Description	Operation
Multi-site Handover	The signal strength received from base station may weaken due to position change and affect the radio's communication quality, in such occasions;the feature allows the radio to automatically register on the base station with stronger signals.	Press[Menu/OK]key then select"Scan"->Options->Handover->On



Background Scan	The feature allows an idle radio to keep detecting the signal strength of the base station with which it register, if the signal strength goes below the threshold level preset by the dealer, the radio will automatically scan for an adjacent base station with stronger signal strength and register with it.	Press[Menu/OK]key then select"Scan"->Options->Background->On
Restrospect Scan	In an overlapping area, the feature allows the radio operation on another channel to switch back to the home station channel when its signal strength reaches the preset threshold. It is recommended that you set your frequently used channel as the home station channel.	Press[Menu/OK]key then select "Scan"->Options->RestrospectScan->On

**Note: Via the programming software, you can set parameters of scanning.**

## 6.7 Positioning

The position feature allows you to collect the location information of the radio by using satellites. Via the programming software you can set position mode as: GPS, BeiDou, GLONASS, GPS + BeiDou, GPS+GLONASS, BeiDou + GLONASS.

### 1. Enable Position

Press [MENU/OK] key select "Location" -> On/Off -> On, to enable location feature.

Press programmed [GPS Switch] key to enable position feature.

### 2. View Location

Press [MENU/OK] key select "Location" -> Current Location ->View, you can view time, longitude, latitude, origin site, origin direction, speed and so on.

### 3.Trunking Mode GPS Report

In trunking mode, there are three types to report the location data: Control channel reporting, dedicated channel reporting or active reporting. If the radio receive effective location data and receive report command from dispatcher,the radio will transmit the location data to dispatcher.

## 6.8 Device Info

You can view the basic information of your radio via menu of radio, including Radio Info, Version and Network Info (Trunking Mode). On the Radio Info menu, you can view: radio ID, Radio Alias, Serial Number, Radio ESN and battery; On the version menu, you can view: Firmware version, DSP version, DB version, Pic version, vocoder, program data; On Network Info, you can view: Area code, Attribution, Control CH Number; SYS Code, If Network. RSSI.

## 6.9 Tools

### 6.9.1 Clock

The radio supports clock reminding feature, when reaching the preset clock time, the radio will ring to remind, you can edit the Label, Time, Repetition. If the clock is ringing, press [Back] key to turn off clock.

### 6.9.2 Notepad

The radio provides a notepad to make a memo, on the notepad menu, you can edit Label, New Contact, Remind Cycle. When reaching the preset time, the radio will ringing to remind, and displays the label and content of notepad, press [MENU/OK] key to view the memo or press [Back] key to turn off reminding.

### 6.9.3 Calendar

This option allows you to view calendar information, on calendar screen and press [MENU/OK] key to input designated date to view the detail of the date.

### 6.9.4 Stopwatch

The radio supports stopwatch feature, press [MENU/OK] key to start timing, and press [MENU/OK] key again to stop timing, and press [Back] key to reset. start timing, and press [MENU/OK] key again to stop timing, and press [Back] key to reset.


## 6.10 Time Out Timer(TOT)

On conventional mode, the purpose of TOT is to prevent any user from occupying a channel for an extended period. If the preset time expires, the radio will automatically terminate transmission and keep beeping, release PTT key to stop beeping. You must wait for TOT Re-key time before you can press and hold down the PTT key to transmit again.

The trunking mode, all timers are: Wireless Call total time, wired call total time, emergency call total time, single voice time. If the preset time expires, the radio will automatically terminate transmission.

**Note: On the trunking system also can set timer, if the trunking system preset time expires earlier than the timer of radio, the radio also will automatically end communication.**

## 6.11 Duplex Mode

The radio supports full duplex mode communication on trunking mode, through the Settings menu or press programmed [Single/Duplex Switch] key to enable duplex feature, the LCD displays:  , only the transmitter and receiver are set as duplex mode, that you can make a full duplex call.

## 6.12 Call Priority

The Call Priority feature allows you to set the priority of the voice service except emergency call, the priority levels are: low, medium, high and preemption, the radio must be authorized that allows to make a preemption call. When all channels are occupied, the call requires are put in a queue according to their priorities. During queuing, the radio displays “be queuing”.

**Note: Via the programming software, you can set the user level.**

## 6.13 Dynamic Re grouping

The feature allows you to initiate a call to or receive a call from a dynamic group temporarily created by a dispatcher. The radio displays the group number when the dynamic group is added successfully; the added dynamic group is saved in a dynamic group list under Contact List menu on your radio.

If the dynamic group is deleted successfully the radio is working on original group.

**Note: The feature and operations of Dynamic group is the same as group call.**

## 6.14 Emergency

In case of emergency, you can enter emergency mode to ask for help from your companion or the dispatcher center. Conventional mode and trunking mode are support emergency feature.

- **Conventional Mode**

On conventional mode, the digital channel and analog channel are support emergency feature, when the digital emergency type is normal, there are 4 emergency modes are available; when the analog emergency is normal, there are 3 emergency modes are available. Short press TK key [Emergency On] to initiate an emergency call, and long press TK key [Emergency Off] to ending an emergency call.

Channel Mode	Emergency Type	Description
Digital	Only Alarm	The radio sends alarm information, while receive ACK or reach the maximum retries will exit emergency mode.
	Alarm and Call	The radio sends alarm information, then press PTT key to initiate an emergency call
	Alarm and Voice	The radio sends alarm information, then you can speak into the microphone in the preset, period to transmit without press PTT key
	Only Call	The radio initiates an emergency call only.
Analog	Only Alarm	The radio sends alarm information only
	Alarm and Call	The radio sends alarm information, then press PTT key to initiate an emergency call
	Only Call	The radio initiates an emergency call only

**Note: when the emergency type is Local Alarm Tone, the radio sounds emergency alarm tones in the native.**

#### ● Trunking Mode

In trunking mode also supports emergency call, you can initiate an emergency call to other terminals or dispatcher. When the emergency type is Normal, there are 3 emergency modes are available. Short press TK key [Emergency On] to initiate an emergency call, and long press TK key [Emergency Off] or press [Hang Up] key to ending an emergency call.

Emergency Type	Description
Only Alarm	The radio sends emergency status message.
Alarm and Call	The radio sends emergency status message. Then press [PTT] key to initiate an emergency call
Only Call	The radio initiates an emergency call only

**Note: when the emergency type is Local Alarm Tone, the radio sounds emergency alarm tones in the native.**

## 6.15 Man Down

When this feature is enabled, the radio automatically sends an alarm for help if it is positioned aslant long time. If enable man down feature, the radio tilts to a specified gradient (30°,45°,60°) within a preset period, the radio gives alerts,you can terminate such alerts by put radio upright otherwise it will enter emergency mode, via the programming software to enable this feature and to set parameters.

## 6.16 Alone Worker

This function is useful for persons who work lonely and encounter an incident;you cannot press any keys or transmit audio within the preset period time.The radio will alarm automatically to ask help. Via the programming software to enable the feature, and setting work alone response time, work alone warn time, work alone response operation.


## 6.17 Stun, Revive and Kill

On trunking mode, the radio supports be Stuned, Revived and Killed by the dispatcher. When the radio is stunned, it displays “Stun”, and it only wait for receiving “Revive” command from dispatcher to restore to normal use. When the radio is killed by dispatcher, it displays in boot logo and all its functions will be locked out except power on/off. To reuse a stunned or killed radio, you need to connect to programming software to enable radio.

**Note: The stun, Revive and Kill features are enabled by default, and triggered by the trunking system. Via the programming software, you can disable the features.**


## 6.18 Encryption

Encryption can encrypt the audio signal and data to guarantee the privacy of your communication.

**Hardware Encryption:** If the radio installs the TF card, and the TF card is detected on startup, you can set the encryption type as hardware encryption via the programming software. Press [MENU/OK] key and select "Settings" to switch encryption or press programmed [Secret Hangover] key to enable encryption feature, the radio displays icon: 

**Advanced Encryption:** To set the advanced encryption during the audio and data communications on the digital channel. If the encryption mode is Advanced, the encryption type is set to Advanced or Basic, Only the receiving radio with the same key value or ID can decrypt the voice or data.

**Basic Encryption:** If the encryption mode is Basic, on the digital channel the encryption type is also basic. Only the receiving radio with the same key value or ID can decrypt the voice or data.

**Note:** On conventional mode supports advanced and basic encryption, if enable encryption feature, the radio displays the icon: , switch to unencrypted will disable it.

## 6.19 Advanced Features

### ● Digital Channel

**Call Alert:** To send an alert to private contact and remind other person to call back.

### ● Initiating Call Alert:

1. In home screen to input private call ID directly using the keypad;
2. Press [MENU/OK] key twice to switch to "Call Alert" item;
3. Press [PTT] key to initiate call alert;
4. In home screen input ID directly then press side key [Call Alert] to initiate call alert.

### ● Analog Channel

**Monitor:** On conventional mode, analog channel with signaling

supports monitor feature, enable monitor feature to receive voice directly without decoding the signaling, press side key [Monitor On/Off] to enable or disable it.

**Squelch:** This feature allows you to adjust the squelch threshold required for the radio to un-mute; the appropriate squelch level depends on the ambient RF noise conditions. You can set squelch level as: Open, Weak, Middle, Tight. If the squelch level is "open", the speaker will keep unmuted no matter whether carrier is present. Enter menu to set squelch level or press side key [Squelch Level] to adjust squelch level.

**CTCSS/CDCSS:** If CTCSS/CDCSS has been set on the current analog channel, CTCSS/CDCSS match is required for the radio to receive an incoming signal. Via the programming software, you can select the type of CTCSS/CDCSS and the monitor squelch mode of receiver.

## 6.20 System Function

**Patching Group:** The radio supports receive patching group command from dispatcher; the function of patching groups is realized by combining multi-group into one group. And also you can delete patching group via dispatcher when not needed.

**Late Entry:** The function of late entry is a group member that has missed the start of a group call can join this active group call later without any operation, the radio moves within the coverage area after the group call is established or the radio is turned on after the group call is established, the radio is busy with other call services when the group call is established, the radio is added to the group after the group call is established, are allowing join in the group call later. All members belongs to this group are support join in group call later.

**Group Call Incorporation:** When you initiating a group call, but another user doesn't belong to this group, the user can transmit this group call, that also can receive the group call.



**Environment Monitor:** The dispatcher can send monitor command to a free radio silently to monitor its activities or background voice. When the monitored radio initiates a call service, the monitoring will end automatically.

**Note: The radio is authorized to receive Environment Monitor command while the feature is checked through the programming software.**

**Conventional Command:** It allows the radio to automatically switch to conventional mode when the dispatcher sends the “Conventional Command” in trunking mode. In conventional mode, the radio receives and transmits voice and data on the selected channel, the selected channel are analog talkaround channel or repeater channel, digital talkaround channel or repeater channel.

**Note: The radio is authorized to receive Conventional command while the feature is checked through the programming software.**

## CTCSS Frequency Standard Table

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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		

# CDCSS Standard Code

CDCSS NO	Positive Code	Negative Code	CDCSS NO	Positive Code	Positive Code	CDCSS NO	Positive Code	Positive 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

<b>General</b>	
Frequency Range	VHF:136-174 MHz UHF:350-400 MHz UHF:400-470 MHz UHF:450-520 MHz
Channel Capacity	1024
Zones	64
Channel Spacing	12.5KHz/25KHz
Operating Voltage	DC 7.4V(±20%)
Battery Capacity	3350mAh
Battery Life ( 5/5/90 )	Digital 40 Hours Analog 28Hours
Frequency Stability	±0.5ppm
Antenna Impedance	50Ω
Dimensions (L×W×H)	65 ( L ) *32(W)*150 (H)mm
Weig	330g(include battery)
<b>Transmitter</b>	
RF Output Power	High : 4.0W Middle : 2.0W Low : 1.0W
4FSK Modulation	12.5kHz Only Data : 7K60FXD 12.5kHz Data and Audio : 7K60FXE
FM Modulation	12.5 kHz : 8K50F3E ; 25kHz : 16KΦF3E ;
Modulation Limiting	+/- 2.5kHz @ 12.5kHz; +/- 5kHz @ 25kHz
FM Noise	-40dB
Conducted Emission	-36 dBm≤1GHz/-30 dBm≥1GHz
Adjacent Channel Power	≤-60dB

Audio Response	+1/-3 dB
Audio Distortion	3%
Digital Voice coder Type	AMBE+ +/NVOC
<b>Receiver</b>	
Digital Sensitivity	5% BER : 0.22uV
Analog Sensitivity	0.22uV (12 dB SINAD)
Intermodulation	65dB
Adjacent Channel Selectivity	60 dB
Spurious Response Rejection	70 dB
FM Noise	-40dB
Audio Response	+1/-3 dB
Audio Output Power	1.0W
Audio Distortion	3% (Typical)
Conducted Spurious Emissio	-57dBm
<b>Environmental Specifications</b>	
Working Temperature	-30°C—+60°C
Storage Temperature	-40°C—+85°C
Humidity	MIL-STD-810C/D/E/F
Vibration & Shock	MIL-STD-810C/D/E/F

## 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.



# Belfone

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