

BelFone

www.belfone.com



BF-TD510

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.

THANK YOU

Since 1989, BelFone has been dedicated to research and explore in the field of radio communication technology throughout the decades, and has developed leading smart technology in the industry. Underpinned by research, development and design geared towards modern complicated and changeable communication environment, it is capable of tailoring specific communication solutions to your needs based on features of your industry. Superior products with outstanding performance may help you control the overall situation, while providing you with the best choice for smart scheduling and instructions communicating.

**This manual is applicable to
BF-TD510 series**

WARNING!

◆ In explosive atmospheres (inflammable gas, dust particles, much powder area, etc.), please turn the power off.

Instructions before Use

It's important for the operator to be aware of and understand hazards common to the operation of any radio .Please observe the following safety precautions to prevent radio damage and 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 in the transmission mode for many hours continuously, the radiator and chassis will become hot, allow the rear panel of the radio to contact a surface of low melting point /low Ignition point object.
- ◆Don' t leave the transceiver in direct sunlight for a long time. Also, don' t place the transceiver on sources of extremely heat, damp, dusty area, or unstable surfaces;
- ◆In areas where the use of radio devices is restricted or warned, please obey the regulation and turn off the transceiver.
- ◆Use of the radio while driving may be against traffic laws in some countries, please check the local traffic laws before using the radio while driving.
- ◆If there is any problems with the radio, please turn the radio off immediately. Then contact the local dealer/technician. Do not modify this radio unless instructed by this manual. Refer to a certified technician only for service.
- ◆If secondary development is required, please contact Belfone or the local dealer for technical assistance;
- ◆Please keep the surface of radio is clean and dry. To clean the radio, use a damp fabric soaked in mild washing liquid.

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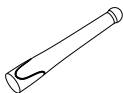
Unpacking and Device Inspection

Note: The following instructions regarding unpacking are only for BelFone's distributors, and service agencies or factories authorized by BelFone.

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 dealer or BelFone immediately.

Accessories

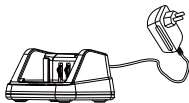
Items	Quantity
Antenna	1
Strap	1
Belt Clip	1
Charger	1
Li-ion Battery	1
Screws	1
User Manual	1
Warranty Card	1
Certificate	1



Antenna



Strap



Charger



Li-ion Battery



Belt Clip



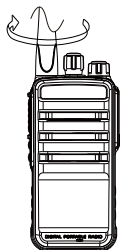
Screws

Installation of Accessories

Installation/ Removing the Antenna

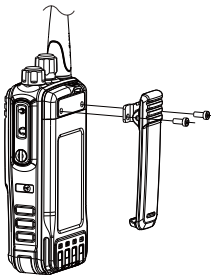
Hold the antenna base, screw it into the connector at the top of the radio until fasten.

Turn the antenna anti-clockwise to remove it.



Installation/ Removing the Belt Clip

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



Attaching/Removing the Strap

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

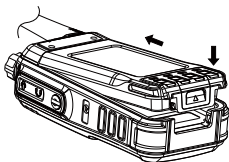


Attaching/Removing the Battery

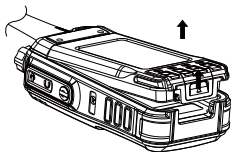
Warning!

- Don't short-circuit the battery, which may cause damaged or catch fire;
- Never attempt to remove the casing from battery, the battery terminals may short circuit;
- 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, 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 latch to unlock the battery and pull the battery away from the radio.



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

Battery Information

The new battery hasn't been fully charged before shipped, please charge more than 5 hours at the first use. The maximum battery capacity and performance is achieved after three full charge/discharge cycles. If 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 the battery, keep it at a temperature among 5°C—40°C. Temperature out of the limit may cause battery leakage or damage.
2. Prior to charging a battery with the radio, it is recommended to turn the radio off.
3. Avoid cut off the power supply or remove the battery during charging.
4. Please ensure that the battery is charged in a dry state before charging.
5. Please change the battery when working time is shorter than normal performance even if the battery is fully charged.

Extend Battery Life

1. The battery performance will be decreased under 0°C. Please prepare a spare battery in cold weather. A battery not work properly in a cold environment does not mean that it is damaged. Please keep the battery and reconfirm at room temperature.
2. The dust on the battery contact point may cause battery faulty, please cleaning it by a dry cloth before using.

Battery Storage

1. Fully charge a battery before storing 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 the battery in a cool, dry place under room temperature, to reduce self-discharge.

Charging the Battery

Use only the charger specified by the manufacturer, the charge indicator indicates the charging progress.

Charger Status	Charger Indicator
Standby(No-load)	Charge Indicator glows green
Battery is charging	Charge Indicator glows red
Battery is fully charged	Charge Indicator glows green

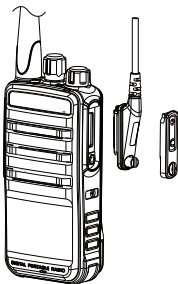
Charge Steps:

- 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.Make 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 fully charged, please remove the battery then.

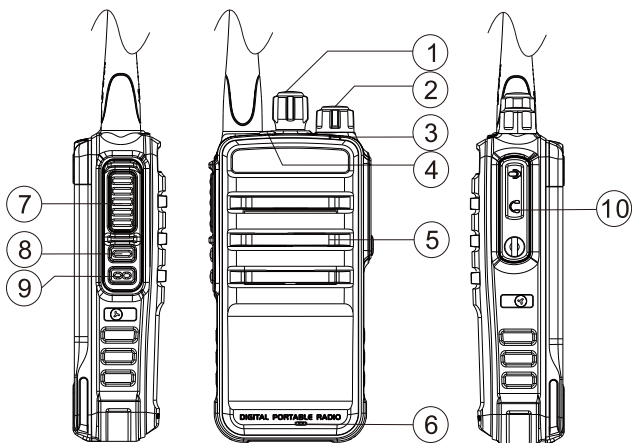
Note: While charging the temperature out of the limit the LED indicator of charger will flash red and green. If battery has damaged or battery is not connected to the charger correctly, the LED indicator of charger also will flash red and green

Attaching the Speaker /Microphone

Open the accessory port cover, then align the plug with the accessory port and tighten the screw on the plug.



Getting Acquainted



① Channel Selector Knob

Turn the knob to select channel 1-16.

② Power switch/volume adjust keys

Rotate clockwise to power on, after the radio is powered on, rotate clockwise to increased volume, anti-clockwise to decrease the volume. Rotate anti-clockwise fully to power off.

③ LED Indicator

When the radio transmitting the LED will glow red, when receiving the LED will glow green; when un-programmed the LED will flashe red; when scanning the LED will flashe red.

④ **Orange Button**

Press to activate the programmable function. The default function is emergency alarm. (The function can be customized by cps.)

⑤ **Speaker**

⑥ **MIC**

⑦ **PTT key**

Press and hold down the PTT key then speak into the microphone to transmit.

⑧ **Button 1**

Press to activate the programmable function. (The function can be customized by cps.)

⑨ **Button 2**

Press to activate the programmable function. (The function can be customized by cps.)

⑩ **MIC-SP-USB Jack**

Connect to optional speaker/MIC and USB programming cable.

Basic Operation

Turning the power on /off

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

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

Adjusting the volume

After the radio is powered on, 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.

Selecting a Channel

Turn the channel selector knob to select channel 1 to 16, rotate the knob clockwise to increase the channel number, or rotate the knob anti-clockwise to decrease the channel number, while all tone alert is enabled, the channel number will sound when change channel.

Note: If a channel is not programmed, the display appears: Un-programmed Channel and a prompt tone "no channel" sounds, LED indicator flashes red.

Selecting a Zone

The radio supports up to 32 zones, each zone with a maximum of 16 channels, all 32 zones can support up to 160 channels. Via the programming software 2 desire zones can be selected at most to write in. Select a desire zone by setting zone toggle function to button 1 or button 2, then handover zone. While all tone alert is enabled, select zone then a zone number and channel number will sound.

Note: SDC /SVT versions support a maximum of 32 zones and 512 channels.

A/D Modes Switching

The **【AD Switch】** buttons can be switched AD mode and DA mode each other. If the current channel is D/A mode, press **【AD Switch】** button to switch A/D mode; If the current channel is A/D mode, press **【AD Switch】** button to switch D/A mode.

Note: AD Switch function only switches the channel mode temporarily, restart the radio or rotate channel selector knob, the current channel will return to its default channel mode.

AD mode is analog compatible digital mode.

DA mode is digital compatible analog mode.

Call

Each digital channel may initiate a private call, a group call or an all call. On analog channel press PTT key to directly initiate call. On digital compatible analog channel press PTT key, if is not within hang time to transmit analog call, within the hang time to call back. On analog compatible digital channel press PTT key, if is not within hang time to transmit digital call, within the hang time to call back;

To transmit press and hold down the PTT key, LED indication glows red, speak into the microphone, hold the palm microphone approximately 3 to 4 centimeters away from mouth.

Note: While talk permit indication feature is enabled, and the channel is available, press PTT key to transmit a tone will sound.

Private Call

If the feature “private call ACK” is enabled, to set up a private call, it needs to confirm whether the called is activated on the current channel.

(1) If a private call contact is preset for current digital channel, press PTT key to set up the private call;

(2) Set the One Touch Call key as private call feature, then press programmed key to set up the private call.

Group Call

- (1) If a group call contact is preset for current digital channel. press PTT key to set up the group call;
- (2) Set the One Touch Call key as group call feature, then press programmed key to set up the group call.

All Call

- (1) If an all call contact is preset for current digital channel, press PTT key to set up the all call;


Receiving and responding to a call









On digital channel, while a private call is received, press the PTT key within the ring time to set up the private call and then to talk each other. If there is not respond to a received private call within the ring time, the radio will display the missed call icon; while a group call is received, press the PTT key within the hang time to call back. While an all call is received, it cannot respond to an all call. On digital compatible analog channel or analog compatible digital channel, the radio will detect digital and analog signal (must have a subsonic) simultaneously when receiving, and if matching signal detected, the current call can be called back within the hang time.

Note: While channel free indication feature is available, if the transmitter releases PTT key a tone will sound.

Button Setting

For enhanced convenience, button1, button2 can be programmed, short and Long press of a key can be assigned with different functions.

Programmable keys are including functions listed below, icon  indicates functions that are available on digital mode.

NO	Shortcut Keys	Description
1	Unassigned	Not assigned with any function
2	On Touch Call 1-6 	Quick transmit group call/ private call/call alert or preset SMS
3	Emergency On 	Send emergency information, only set short press on orange button
4	Emergency Off 	Exit emergency mode, only set long press on orange button
5	Monitor	Enable or disable monitor function
6	Scan On/Off	Enable or disable scan function quickly
7	All Alert Tones On/Off	Enable or disable all tones quickly
8	Battery Indication	It's convenient to know battery capacity. If battery strength level is 70%-100%, a Power High sound; if battery strength level is 30%-70%, a Power Middle sound; if battery strength level is 15%-30%, a Power Low sound.
9	Zone Toggle	Quick access to Zone Toggle
10	Satellite Positioning On/Off	Enable or disable satellite positioning function quickly. When the satellite positioning mode is set to off via the programming software, pressing the side button to turn on the satellite positioning defaults to high-performance mode. When it is set to power saving or high-performance mode, press the side button to turn off the satellite positioning and if turned on again, the satellite positioning mode remains unchanged.
11	Priority Interrupt 	Interrupt activity of current channel forcibly
12	AD Switch	Temporarily switch channel mode to AD or DA
13	Flashlight On/Off	Enable or disable flashlight quickly
14	High/Low Power	Switch High/Low Power quickly
15	Repeater/Talkaround	Enable or disable talk around quickly
16	VOX On/Off	Enable or disable VOX quickly
17	Nuisance Delete	Temporarily ignore unwanted channel activity
18	Record On/Off	Enable or disable record quickly
19	Permanent Monitor	Enable or disable permanent monitor function
20	Site lock on/off 	Quickly enable or disable lock site function.
21	Manual Site Roam 	Quickly search the available site manually.
22	System Status Query 	Query the network and satellite position status in the online channel.
23	Channel Lock	Quickly enable or disable channel lock function.
24	Encrypt Switch 	Quickly enable or disable encryption function.

Functions and Operations

Voice Encryption

The voice encryption can encrypt the audio signals to guarantee the privacy of the communication, via the programming software user can select encryption type as static, dynamic or advance dynamic. The SDC/SVT version supports encryption types such as XOR, Enhanced XOR, ARC4, AES256, Advance ARC4 or Advance AES256. Among them, XOR, enhanced XOR, ARC4, and AES256 only encrypt voice. If the encrypt feature is enabled, the transmitter and receiver must be set as the same encryption type and encryption key, otherwise the receiver cannot get the normal audio.

Note: This feature is effective on digital channel, if enable voice encryption feature is enabled, the voice encryption key must be 10 characters, there are including letters and numbers.

VOX

If VOX feature is enabled , the radio will automatically begin transmitting when speaking, and terminate transmitting when stopping talking with no need of PTT press. When the environment too much noise, VOX level will be higher, when the environment is quiet, VOX level will be lower. If the VOX level is set as off via the programming software, press programmed VOX on/off key can't enable VOX feature, if the VOX level is set as 1 to 8, press programmed VOX on/off key can enable or disable VOX feature

Note: The VOX feature is only effective when plugging in a dedicated earpiece.

Battery Saver

This function allows an idle radio to automatically enter battery saver mode, which will extend battery service life, but response time will be delayed. Battery saver time ratio can be set the smaller the time rate, the more obvious the power saving.

Via programmable software to set it: General Setting folder→Battery Saver

Warning Tones

Voice Indication

If voice indication feature is enabled, the radio will give tone indication for channel change, zone change, power level switch, scan feature enable or disable, VOX on or off, low battery alert, repeater mode or talk around mode switch and etc.

Channel Free Indication

On digital mode, if Channel Free Indication feature is enabled, the receiver gives a high-pitched tone indication while the transmitter releases PTT key to stop transmitting.

Channel Free Indication

There are four options are available for Talk Permit Indication feature:

None: the radio does not give any tone indication for transmission on analog and digital channel

Analog: the radio gives tone indication for transmission on analog channel

Analog& Digital: the radio gives tone indication for transmission on analog and digital channel

Digital: the radio gives tone indication for transmission on digital channel.

Reject Stranger Call

On digital mode, if reject stranger call feature is enabled, and the call ID is not exist in the contacts list, the call cannot be set up. On group call or all call, the caller's ID and group call ID or all call ID must be preset on address list.

Direct Mode

If DMO function is enabled users can transmit with different frequency directly. Only the transmitter and receiver are set direct mode simultaneously and the TX frequency of the transmitter is the same as the RX frequency of the receiver, can the radio directly communicate in DMO mode.

Low Battery Warning

When the battery gets low, LED indicator glows red and there will be a warning tone: "Please Charge", please replace the battery or charge the battery in time, otherwise the radio will turn off automatically while battery is too low.

Digital Emergency

In case of an emergency, short press programmed “Emergency on” key to send emergency information, long press “Emergency off” to exit emergency mode. On regular type alarm, after sending emergency information when ACK command is received or the alarm cycles expires, the radio will exit the emergency mode automatically. On silent type alarm, after sending emergency information press PTT key to exit emergency mode. There are three emergency types and three emergency modes available

- **Emergency Type:**

Regular: In emergency mode, the radio will give audible and visible indication;

Silent: In emergency mode, the radio won't give any audible or visible indication.

Silent with Voice: In emergency mode, the radio won't give any audible or visible indication, but it plays any voice calls if receiving matched signal.

- **Emergency Mode:**

Alarm: In this mode, users can send alarm information, while ACK is received or reach the maximum retries the radio will exit emergency mode.

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

Alarm with voice to follow: Press programmed” Emergency On/Off” key to send emergency information, then speak into the microphone, voice and background noise can be transmitted automatically without the need to press PTT key.

- **Revert Channel:** Revert channel is used for digital emergency, only channels with a default address of group call contact can be set as revert channel.

- **Impolite Retries:** The number of times an emergency information should be sent when there is activity on the current channel.

- **Polite Retries:** The number of times an emergency information is sent only when there is no activity on the current channel.

- **Hot MIC Duration:** If the emergency mode is set as emergency alarm with voice to follow, after sending emergency information, voice and background noise will be transmitted automatically without press PTT key within hot MIC duration.

Note: while the short press is set as emergency on, the long press will be set as emergency off default.

Scan

Scan is useful for monitoring signals on the radio channels, the channels are included in the scan list. While scanning, the radio checks for a signal on each channel and only stops on a channel if a signal is active. Press programmed Scan on/off key to begin scanning, while scanning on, a “scan on” sounds, LED indicator flashes red. While scanning off, a “scan off” sounds

- **Scan Hang Time** : When a signal is detected on a channel, scan pauses on that channel, the radio will remain on the busy channel until the signal is no longer active. When the signal “ drop out” the radio will remain on the channel momentarily before scan resumes.
- **Talkback** : When a signal is detected on a channel, scan pauses on that channel, press PTT key can talk back on the channel if enable “Talk Back’ feature; if “Talk Back” isn’t checked, press PTT key may talk back on the designated channel.
- **TX Designated Channel** : During scanning, press PTT key the radio will transmit on TX designated channel.

Auto Scan

If Auto Scan feature is enabled for a channel, the radio will automatically enter scan mode when switching to this channel. To stop scanning, press programmed Scan On/Off key or switch to other channels. Returning to the channel will enter scan mode directly.

Monitor and Permanent Monitor

Monitor: Both analog and digital channel support to monitor current channel activities and receive weak signals. Press the programmed Monitor key to enable the monitor function, if a signal is detected, until the signal is no longer active the radio will exit monitor mode.

Permanent Monitor: Permanent monitor feature is the same as monitor, but long press the Permanent Monitor key to enter monitor mode, the radio will remain on monitor mode until long press it again to exit.

Message

On digital channel and digital analog compatible channel, preset messages can be sent by programmed one touch call key. Message text can be edited via programming software.

One Touch Call

On digital channel and digital analog compatible channel, one touch call feature contains: send messages to a group call contact, set up a call to a group call contact, send messages to a private call contact, send call alert to a private call contact and set up a call to a private call contact.

● Group Call

On one touch call menu, set the call member to group call contact, set the group call type, and set the programmed key as one touch call. Then press the programmed key, a high-pitched tone will sound, with 5 seconds press PTT key to set up the group call.

● Group Message

On one touch call menu, set the call member to group call contact, set short message type, select a message text that from preset message list, and set the programmed key as one touch call. Then press the programmed key to send a group short message call.

● Private Call

On one touch call menu, set the call member to private call contact, set private call type, and set the programmed key as one touch call. Then press the programmed key, a high-pitched tone will sound, with 5 seconds press PTT key to set up a private call.

● Private Message

On one touch call menu, set the call member to private call contact, set private short message type, select a message text that from preset message list, and set the programmed key one touch call. Then press the programmed key to send a private short message.

● Call Alert

On one touch call menu, set the call member to private call contact, set call alert type, and set the programmed key as one touch call. Then press the programmed key to send private call alert.

Talk Around

When the repeater malfunctions, or the radio is out of repeater's range, communications can be continued in talk around mode. While talk around feature is enabled, TX frequency will be set the same as RX frequency. Press the programmed Repeater/Talk Around key to switch between repeater mode and talk around mode. Switch to talk around, a "talk around" sounds; switch to repeater mode, a "repeater" sounds.

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

TX Power

Power levels can be switched to Low or High. If communicating with radios located at a distant place please select High power; if communicating with radios located at a close place please select Low power to save battery. Press the programmed High/Low Power key to switch between high power and low power. Switch to high power, a "high power" sounds; switch to low power, a "low power" sounds.

Bandwidth

On analog mode, there are two types of bandwidth available, wide (25 KHz) or narrow (12.5 kHz) can be chosen.

Squelch Level

On analog mode, this feature can adjust the squelch threshold for the radio to receive audio. High level requires stronger signal for the radio to un-mute.

Time out Timer (TOT)

The purpose of TOT is to prevent any user from occupying a channel for an extended period. If a channel is busy, the time will glow shorter. If the preset time expires, the radio will generate beep and terminate transmission automatically.

TX Permission

Digital Channel

This feature can restrict the channel from transmitting if it is busy. If always is set, whenever pressing PTT key to the radio will transmit directly; If color code free is set, the radio will be unable to transmit on the channel if a radio with the color code is in use; If channel free is set, the radio will be unable to transmit on the channel if the channel is in use. If the channel is busy, press PTT key, a low-pitched tone will sound.

Analog Channel

This feature is available in the analog mode and can restrict the channel to transmit if it is in use. If off is set, whenever press PTT key, the radio can transmit directly; If carrier is set, the radio will be unable to transmit on the channel if the channel is in use; If CTCSS/CDCSS is set, the radio will be unable to transmit on the channel if a radio with the same CTCSS/CDCSS code is in use. If the channel is busy, press PTT key, a low-pitched tone will sound.

CTCSS/CDCSS

On analog channel, unique CTCSS/CDCSS can be set to guarantee the privacy of the communication, on digital compatible analog channel or analog compatible digital channel, CTCSS/CDCSS must be set. If 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 nonstandard CTCSS frequency or CDCSS code manually.

Via programmable software to set it: Channels folder→ Zone→ a analog channel→ TX Parameters to select encode→ RX Parameters to select decode

- **Decode:** Only when receiver receives a call which match the CTCSS/CDCSS, the voice can be decode;
- **Encode:** Signal that transmit will only be heard by parties whose CTCSS/CDCSS signaling matches the transceiver.

Note: The radio approve of non-standard code, on analog mode, you can input non-standard code as you need.

Dual Capacity Direct Mode

If enable TDMA direct mode, the members in the same group call must use the same slot, one frequency supports calls in two slots synchronously in order to avoid interfering communications in the other slot.

Via programmable software to set it: Channels folder→Zone→a digital channel or A/D Channel→TDMA Bypass Mode→Slot Align→Slot→Pseudo Trunk TX Slot

Note: This function is available only in digital operation.

Radio Priority-Based Interrupt

The call priority feature allows the radio to interrupt the on-going call on current forcibly, a preemptive call can interrupt other on-going calls which 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.

Via programmable software to set it: Channels folder→Zone→a digital channel or A/D Channel→Priority Interrupt→Voice Priority

Note: This function is available only in digital operation

Voice Recording

While voice recorder is enabled, it will continuously record all transmitted and received signals. There are 2 recording 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 to view or play the voice . Recording files are created at half hour intervals, the suffix of records as 000 represents uncompress, 0001 represents compress. While the radio switches to U-Disk mode, the voice records can download to PC to play.

Note:

- **While the battery gets low, the auto voice recording function will disable automatically.**
- **Voice recording is an optional feature.**

Alone Worker

This function is useful for persons who work alone situation. When the user encounters an incident; and doesn't press any keys or transmit audio within the preset period time, the radio will alarm automatically to ask help.

Note: Alone Worker is an optional feature.

Man Down

When this feature is enabled, the radio will automatically send an alarm for help if it is positioned aslant or keeps motionless long time. If the trigger type is set as Only Lean, and the radio tilts to a specified gradient (30° , 45° , 60°) within a preset period, the radio will give alerts. To terminate such alerts, put radio upright otherwise it will enter Emergency mode; If the trigger type is set as Only Motion Detection, and the radio stays motionless within a preset period, it will enter Emergency mode.

Note: Man Down is an optional feature.

Satellite Positioning

The location function includes GPS position system and Beidou Satellite system. The Satellite Positioning function allows user to view location information, including time, date, longitude, latitude, speed, altitude, and number of available satellites. When location is enabled, the radio will transfer its positioning information automatically to the center if connect counts or PTT counts is reached. Location data also can be manually transmitted to an individual user.

Note: Satellite Positioning is an optional feature.

Networking

The radio supports registration to the network system, and can adapt to the Belfone Smart Dispatching Connection(SDC) System or the Smart Virtual Trunking(SVT) system to realize the interconnection communication under the networking mode. The network mode can be selected as SDC or SVT mode. In "SDC" mode, the channel will not support scanning, roaming, and normal digital emergency alarm functions. When the channel is in different receiving

and transmitting frequency, the network mode can be selected as "SVT", which will not support functions such as scanning, roaming, normal digital emergency alarms, color codes, etc. So the SDC mode, if the SDC system need roaming function that the radio can set "Roam" item in the radio to support the radio roam to others site. The SVT mode can set in "SVT setting" item. The scan function is set in the "Scan"item, if want to support scan function in sdc mode or SVT mode of the radio. Channel slot will be defaulted to pseudo trunk, and transmitting slot defaulted to none.

Note: The network feature is only valid for the SDC/SVT version.

Local Call

The local call can be effective only when the network function is enabled in digital channel. Check the local call, the call initiated by the radio is forwarded only under its repeater, and the callback mode during receive hang-up time is based on the type of incoming call (in the networked or not).

Patrol System

Set whether the radio can activate emergency alarm and track monitor function in online status. When emergency alarm is enabled, the radio will automatically send voice and position information to the system(SDC) by pressing the alarm key. It can set alarm type, send times, call contact, auto monitor time and auto trace time. When track monitor is enabled, the radio will continuously send position information to the system(SDC) according to the set polling time and minimum distance.

Pseudo Trunk

If the slot is set as Dual slot, and one time slot is already occupied, it can transmit and receive on another free time slot. If the Specify Transmit Slot is set as "NONE", both time slot 1 or time slot 2 can transmit. If the Specify Transmit Slot is set as 1, press PTT key to transmit voluntary only in time slot 1 and if the Specify Transmit Slot 2, press PTT key to transmit voluntary only in time slot 2. The Specify Transmit Slot set is invalid for replying.

SVT

After entering the pseudo trunk channel, the radio will login its belonging group. If registration fails, there will be a voice prompt of "refuse to log in". Registration can be initiated again after restarting or switching channels. After successful registration, a voice prompts "single station", "multi station disconnection", "disconnection mode", "multi station interconnection", and "network mode". If it is currently in "weaken mode", the voice prompt will be "weaken mode".

Networking status:

Connection Status	Site type	Standby interface (fourth line)
The radio is not synchronized with repeater, and is in scanning		Connecting...
The radio is synchronized with repeater, but the repeater is not connected to controller		Weaken mode
The radio is synchronized with repeater, and the repeater is connected to controller, but the radio is not successfully registered		Unregistered
The radio is synchronized with repeater, the repeater is connected to controller, and the radio is successfully registered, but the controller is not connected to network	Single site	Single site
	IP interconnection	Multi station disconnection
	8200 system	OFFNET mode
The radio is synchronized with repeater, the repeater is connected to controller, the radio is successfully registered, and the controller is connected to network	IP interconnection	Multi site interconnection
	8200 system	Network mode

Note: The standby interface of the SVT channel is not affected by the channel display mode.

Voice Receiving and transmitting status

Radio Status	Transmit	Receive
Connecting...	Prohibit	Prohibit
Weaken mode	Allow	Allow
Unregistered	Prohibit	Prohibit
Single site	Allow	Allow

Radio Status	Transmit	Receive
Multi station disconnection	Allow	Allow
OFFNET mode	Allow	Allow
Multi site interconnection	Allow	Allow
Network mode	Allow	Allow

In the SVT channel, directly press PTT to transmit a call to the default number, or press the one touch call key to transmit the call. The hang time of private and group calls is controlled by the system. All calls do not support callback, and releasing PTT will end the call.

When pressing PTT to transmit a belonging group call, if the belonging group is in the call, the radio will join the group call and a prompt "Group call merge" will sound, and then receive the group call.

SVT Settings

This is to set the belonging group and cross station roaming list for the radio on the pseudo trunk channel. After entering the pseudo trunk channel, the radio will login its belonging group. When the authentication function of the repeater belonging to the radio is enabled, it is also necessary to configure the activation authentication key to be consistent with the repeater.

Note: The SVT feature is only valid for the SVT version.

Roam

This feature allows the radio communicate between available sites in the IP Site Connection system. If the Roaming feature is enabled, the radio can communicate via any site in the IP Site Connection system, thus ensuring seamless communication in the system. The radio supports start roam automatically and site roam manually.

Note: It allows the user to associate one of a scan list or roam list to the current channel, but not allows to enable both features at the same time.

Roaming function is only supported in the SDC/SVT version.

CTCSS Standard Frequency Table

CTCSS No.	Freq. [Hz]	CTCSS No.	Freq. [Hz]	CTCSS No.	Freq. [Hz]	CTCSS No.	Freq. [Hz]
1	67.0	11	94.8	21	131.8	31	186.2
2	69.3	12	97.4	22	136.5	32	192.8
3	71.9	13	100.0	23	141.3	33	203.5
4	74.4	14	103.5	24	146.2	34	210.7
5	77.0	15	107.2	25	151.4	35	218.1
6	79.7	16	110.9	26	156.7	36	225.7
7	82.5	17	114.8	27	162.2	37	233.6
8	85.4	18	118.8	28	167.9	38	241.8
9	88.5	19	123.0	29	173.8	39	250.3
10	91.5	20	127.3	30	179.9		

CDCSS Standard Code Table

CDCSS NO	Positive Code	Negative Code	CDCSS NO	Positive Code	Negative Code	CDCSS 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:136-174 MHz/UHF:350-390 MHz /UHF:400-480 MHz/UHF:450-520 MHz
Channel Capacity	BF-TD510: 160 / BF-TD510(SDC/SVT): 512
Zones	32
Channel Spacing	12.5KHz/25KHz
Operating Voltage	DC 7.4V (±20%)
Battery Capacity	1600mAh
Battery Life (5/5/90)	Digital 16Hours / Analog 12Hours
Recording Time	400 Hours
Frequency Stability	±1.5ppm
Antenna Impedance	50Ω
Dimensions (L×W×H)	60.8 (L) * 35.7(W)* 118.5 (H)mm
Weight	250g(Including Battery)
Transmitter	
RF Output Power	High Power: ≤3.5W Low Power: 1.0W(±0.3)
4FSK Modulation	12.5kHz Only data: 7K60FXD 12.5kHz data and audio: 7K60FXE
FM Modulation	12.5 kHz: 8K50F3E; 25 kHz: 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

Receiver	
Digital Sensitivity	5% BER: 0.25 μ V
Analog Sensitivity	0.25 μ V (12 dB SINAD)
Intermodulation	60dB
Adjacent Channel Selectivity	60 dB
Spurious Response Rejection	60 dB
FM Noise	-40dB
Audio Response	+1/-3 dB
Rated Audio output power	0.5W
Max Audio output power	1.2W
Audio Distortion	3% (Typical)
Conducted Spurious Emission	-57dBm
GPS Accuracy	Horizontal Accuracy \leq 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—+60 C
Storage Temperature	-30 C—+85 C
Humidity	MIL-STD-810G
Vibration & Shock	MIL-STD-810G
Dustproof & waterproof	IP68

Statement

This manual is compiled to be accurate and complete for operator's use. For any doubt, please contact Belfone. We will give you professional answers. As radio communication technologies develop rapidly, Belfone reserves the right to change product design and specification without prior notice to consumers.

Belfone

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