BelFone

www.belfone.com

BF-TD872

Professional Digital Transceiver

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!

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.

This manual is applicable to

VHF/ UHF FM transceiver model: BF-TD872

Warning!

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

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 BeiFeng'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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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.

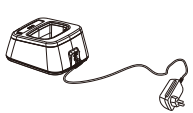
Accessories

Items	Number	Quantity
Antenna		1
Strap		1
Belt Clip		1
Charger		1
Li-ion Battery		1
Screws		2
Instruction Manual		1
Warranty Card		1
Certificate		1

Antenna

Strap

Charger



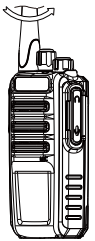
Li-ion Battery

Belt Clip

Screws

Installation of Accessories

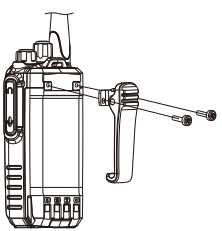
Installation/ removing the antenna



Hold the supplied antenna by its base, then screw it into the connector on the top panel of the radio until fasten.

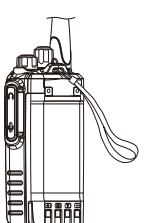
Turn the antenna anti-clockwise to remove it.

Attaching/Removing the belt clip



Attach the belt clip using the two supplied3*4mm binding screws.

Attaching/Removing the Strap



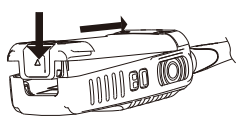
Thread the hand strap to the loop back of your radio.

Attaching/Removing the Batter

Warning!

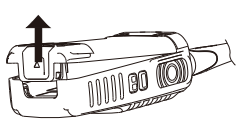
- Don't short-circuit the battery, it may cause the battery damaged or burst into flame;
- Never attempt to remove the casing from battery, that avoid to short the battery terminal;
- Battery is flammable objects, don't throw it into fire or don't use it on dangerous area.

Match the guides of the battery with the two corresponding grooves on the bottom of the radio, press the battery down 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 and pull the battery away from the radio.

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



Li-ion battery features

● New batteries are activated from factory; please charge your battery before using it. The maximum battery capacity and performance is achieved after three full charge/ discharge cycles.

● The service life of batteries: Charge cycles time is limited, to prolong battery life try to reduce make charge by the battery remained.

● To reduce self-discharge, please remove the battery before you not in use for a long time, and store your battery in a cool, dry location.

● Charge your battery about 50% before you store it for a long time, so that can prevent to decrease the battery performance.
● As the battery is charged and discharged repeatedly, the battery capacity decreases, even if the battery is unused, the battery degrades, and store battery in a high temperature will shorten its lifecycle.

Charging the Li-ion battery

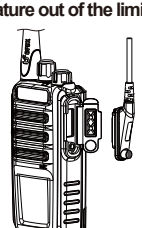
● When the battery power runs low, the radio will send alert sounds, please recharge the battery.
● Please only use the battery and charger specified by BeiFeng.
● When charging a battery attached to a radio, please turn the radio off.
● Please don't remove the battery from the charger before fully charge, or the battery could suffer damage.
● Please remove the battery timely when the battery is fully charged.
Note: While the battery is charged, the ambient temperature must be within 0~40, temperature out of the limit may reduce working life or charging efficiency.

Charging Steps:

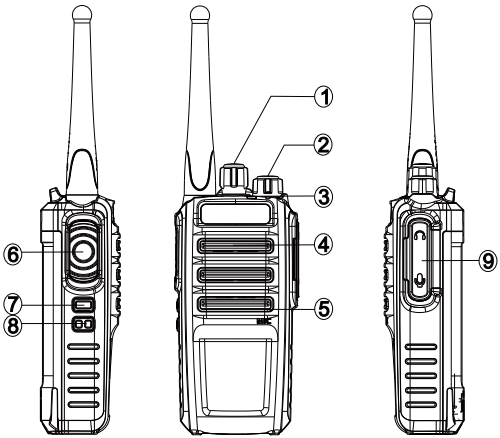
1. Connect charging line to power adapter, plug the Micro USB of charging line into the USB interface on the back of the battery (You can charge the battery only or the radio attached with a battery).
2. Plug the AC connector of the power adapter into the outlet socket.
3. The charging process initiates when the indicator on the left side of battery USB interface and the power adapter indicator glows red.
4. The battery indicator and charger indicator glow green when the battery is fully charged.
Note: Mack sure the battery is connected to the charger, but the charger indicator not glow, Maybe the battery /charger has damaged or temperature out of the limit.

Attaching the Speaker/Microphone

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



Getting Acquainted



① **Channel Selector Knob**
Turn the knob to select channel 1-16, if a channel is available, there will be a channel number sounds.
② **Power Switch/Volume Adjust Keys**
Turn clockwise to switch the radio power on. Turn rotate clockwise or counter-clockwise to adjust the volume. Turn counterclockwise fully to switch the radio off.
③ **LED Indicator**
When transmitting LED glows red; when receiving LED glows green; when scanning LED flashes red; when battery gets low, LED flashes red.
④ **Speaker**
⑤ **Microphone**
⑥ **PTT Key**
Press and hold down the PTT key then speak into the microphone to transmit.
⑦ **Button 1**
Press to activate the programmable function. (The detailed consult to basic operation)
⑧ **Button 2**
Press to activate the programmable function. (The detailed consult to basic operation)

⑨ **MIC-SP Jack**
Connect to optional speaker/MIC and programming cable.

Basic Operation

Turning the power on /off

Rotate the power switch/volume adjust keys clockwise to turn the power on. A current channel number sounds.
Rotate the power switch/volume adjust keys anti-clockwise to turn the power off.

Adjusting the 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.

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.

Note: While the channel is un-programmed, a prompt tone:" no channel "sounds.

Selecting a Zone

The radio supports up to 32 zones, each with a maximum of 16 channels, 32 zones all support up to 160 channels. Via the programming software you can select 2 desire zones at most to write in. You may select a desire zone through by setting zone toggle function to button 1 or button 2, then handover zone. While enable all tone alert, select zone will hear a zone number.

Calls

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 your mouth.

1. Group Call

If you want to transmit a group call, the radio must be set with group call contact and preset a group call contact for current digital channel, press PTT key to transmit a group call. Or you can set the One Touch Call key as group call feature, then press programmed key to transmit a group call. Release PTT key to receive.

2. Private Call

If you want to transmit a private call, the radio must be set with private call contact and preset a private call contact for current digital channel, press PTT key to transmit a private call. Or you can set the One Touch Call key as private call feature, then press programmed key to transmit a private call. If the feature "private call ACK" is enabled, to transmit a private call need to confirm whether it is power on or activate on the current channel , while private call is failed, a low-pitched tone sounds. Release PTT key to receive.

3. All Call

If you preset an all call contact for current digital channel. Press PTT key to transmit an all call; Release PTT key to receive.

Button Setting

For enhanced convenience, you may program the keys button1, button2, short and Long press of a key can be assigned with different functions.

Programmable keys are including functions listed below:

- **Unassigned:** The key is not assigned with any function.
- **One Touch Call 1~6:** Allow user to initiate digital group call, digital private call, or send preset message or send call alert via the one touch call function.
- **Emergency on/off:** Allow user to make an emergency call.
- Monitor：Enable monitor function.
- **Scan on/off:** Allow user to enable or disable the scan function.
- **All alert tone on/off:** Allow user to enable or disable all alert tones.

● **Battery Indication:** It's convenient to know battery capacity. If battery strength level is 70%-100%, a "Power High "sounds; if battery strength level is 30%-70%, a "Power Middle" sounds; if battery strength level is 15%-30%, a" Power Low "sound.

Note: If the battery gets lower, a "Please Charger" tone will sound, at the time press programmed" Battery Indicator" key, you can't hear battery capacity indication sound.

● **Zone Toggle:** Allow user to change zones, if the radio contains 2 zones, press programmed button will be a zone number sounds. If the radio only add a zone, this feature is useless.

● **High/Low Power:** User can switch the Tx power level between high and low power by pressing the programmed High/Lower Power key.

● **Repeater/talk around**: Allow radio set to connect through repeater or achieve standalone communication in talk around mode.

● **Vox on/off :** If set vox level as 1 to 8 via programming software, press the programmed VOX on/off key to enable or disable the VOX feature. Press to activate the VOX feature a VOX on sounds; disable the VOX feature a VOX off sounds.

Note: Plug the dedicated earpiece into the accessory jack of the radio, the VOX feature is effective.

● **Nuisance Delete**: While scanning on, If you don't want to receive activities on the channel, press the programmed Nuisance Delete key to remove the channel from the scan list temporarily. When restart scanning, the nuisance channel will **return to scan list.**

● **Permanent Monitor:**Permanent monitor feature is the same as monitor, but permanent monitor feature only can be set as long press key. And you should long press the programmed Permanent Monitor key to exit this feature.

Functions and Operations

Scan

Scan is useful for monitoring signals on the radio channels, the channels include 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 present. Press programmed Scan on/off key to begin scanning, while scanning on, a “scan on” sounds, LED indicator flash red. While scanning off, a “scan off” sounds
Via programmable software to set it: Scan folder(Scan hang time) → A desired scan list → add available channel to members channel → a digital or analog channel to select scan list**.**

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 present. When the signal “ drop out” the radio will remain on the channel momentarily before scan resumes. The delay time is programmed 500 to 10000 milliseconds.
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 will transmit on TX designated channel. You can set TX Designated Channel as Last Active Channel, Selected channel or a desired channel from scan list.

Auto Scan

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

Monitor and Permanent Monitor

Monitor: Enable the Monitor feature to monitor current channel activities and receive weak signals. Press the programmed Monitor key to activate the monitor function, if a signal is detected, until the signal is no longer present 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, you can send preset messages by programmed one touch call key. Edit message text via programming software, the message list save up to 10 entries, and each of a message contains 140 characters at most.

One Touch Call

On digital channel, one touch call feature contains: to send messages or transmit to a group call contact, to send messages or send call alert and transmit to a private call contact.

Group Call: On one touch call menu, the call member select group call contact, and the call type select group call. Then the programmed key set as one touch call, press the programmed key a high-pitched tone sound, with 5 seconds press PTT key to transmit a group call.
Group Message: On one touch call menu, the call member select group call contact, and the call type select short message, message text select from preset message list. Then the programmed key set as one touch call, press the programmed key to send a message to a group call.
Private Call: On one touch call menu, the call member select private call contact, and the call type select private call. Then the programmed key set as one touch call, press the programmed key a high-pitched tone sound, with 5 seconds press PTT key to transmit a private call.
Private Message: On one touch call menu, the call member select private call contact, and the call type select short message, message text select from preset message list. Then the programmed key set as one touch call, press the programmed key to send a message to a private call.
Call Alert: On one touch call menu, the call member select private call contact, and the call type select call alert, then the programmed key set as one touch call, press the programmed key to send call alert to a private call.

Talk Around

Talk Around: When your repeater malfunctions, or when radio is out of repeater's range, you can continue to communicate in talk around mode. While enable talk around feature, by this time TX frequency is the same as to RX

frequency. Press the programmed Repeater/Talk Around key to switch between repeater modes and talk around mode. Switch to talk around, a “talk around” sound; switch to repeater mode, a “repeater” sounds.
Via programmable software to set it: Channel folder → Zone → a digital or analog channel → Allow Talk Around
Note：To enable this function, TX frequency should be different from RX frequency, and the channel will set as allow talk around on the programming software.

TX Power

You can switch power levels to Low or High. If you communicate with radio located at a distant place please select High power; if you communicate with radio 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.
Press programmed High/Low power key to switch power level or select power level via programming software.
Via programmable software to set it: Channel folder → Zone → a digital or analog channel → TX Parameters → Power Level

Emergency

In case of an emergency you can enter emergency mode to ask for help, short press programmed “Emergency on” key to send emergency information, to exit emergency mode, long press “Emergency off”. On regular type alarm, after send emergency information then receive ACK command or the alarm cycles expire, the radio will exit the emergency mode automatically. On silent type alarm, after send emergency information then press PTT key to exit emergency mode.
Via programmable software to set it: Signaling Systems folder → Digital Red Alert → add system1 to set parameters → Channel folder → add Emergency system

Emergency Type: Disable, Regular, Silent, Silent with voice, the Disable option is unable to transmit emergency information;

Emergency Mode: Emergency Mode: Emergency Alarm, emergency alarm with call, emergency alarm with voice to follow.
Revert Channel: Revert channel is used for digital emergency, only the channel default address is set as group call contact, the channel is available for revert channel.
Impolite Retries: If the current channel is busy, press programmed key also can send emergency information, number of impolite retries can be set as 1to 15.
Polite Retries: Only when the current channel is free, press programmed key to send emergency information, number of polite retries can be set as 0 to 14 and endless.
Hot MIC Duration: If the emergency mode set as emergency alarm with voice to follow, after send emergency information, you voice and background noise to be transmitted automatically as you don't need to 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.

Time Out Timer (TOT)

The purpose of TOT is to prevent any user occupy a channel for an extended period. If a channel is busy, the time will be shorter. If the preset time expires, the radio will generate beep and terminate transmission automatically. Via programming software, you can set TOT as 15-495 second.
Via programmable software to set it: Channels folder → Zone → A digital or analog channel → TX Parameters → TOT-TOT Rekey Delay

Voice Encryption

The voice encryption can encrypt your audio signals to guarantee the privacy of your communication, via the programming software user can select encryption type as static or dynamic. If the encrypt feature is enabled, the transmitter and receiver will be set as the same encryption type and same voice encryption key, otherwise the receiver is mute.
Via programmable software to set it: General Settings folder →Voice Encryption Type→ Voice Encryption Key

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

VOX

If enable VOX feature you can enjoy hands-free communication, the radio will automatically begin transmitting when you speaking, and terminate transmitting when you stop talking with no need of PTT press. You may set VOX level as1~8 or disable (Off). When the environment too much noise, VOX level will be higher, when the environment is quiet, VOX level will be lower. It allow user to set VOX delay as 500 to 10000 milliseconds. 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

Via programmable software to set it: General Settings folder →VOX level→ VOX delay(ms)

Note: The VOX feature shall work with a dedicated earpiece.

Warning Tones

Voice Indication

If enable voice indication feature, 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 enable Channel Free Indication feature, the receiver gives a high-pitched tone indication while the transmitter release PTT key to stop transmitting.

Talk Permit Indication

There are four options are available for Talk Permit Indication feature: None (the radio does not give any tone indication for transmission), Enable (the radio gives tone indication for transmission).
Via programmable software to set it: General Settings folder →Tone Alerts → Voice Indication → Channel Free Indication → Talk Permit Indication

Reject Stranger Call

If enable reject strange call feature, while the call ID not exist in the contacts list, it's unable to transmit or receive. When received group call or all call, the device ID of transmitter and group call ID or all call ID should preset on address list.
Via programmable software to set it: General Settings folder →Reject Strange Call

TX Permission

This feature can restrict the channel if it is already in use you will be unable to transmit. There are three options available: always, color code free, channel free, if choose always, whenever press PTT key to transmit directly; If choose color code free, you will be unable to transmit on the channel if the color code is already in use; If choose channel free, you will be unable to transmit on the channel if it is already in use. If the channel is busy, press PTT key a low-pitched tone will sound.
Via programmable software to set it: Channels folder → Zone → a digital channel → TX Parameters → Admit Criteria

Battery Saver

This feature allows an idler radio to automatically enter battery saver mode, the mode will extend battery service life, but response time may be delayed. You can set battery saver time ratio as : 1:1、1：2、1:3、1:4, the time rate is

smaller, the power saving more evidently.
Via programmable software to set it: General Setting folder → Battery Saver

Lowery Battery Alert

When your battery gets low, LED indicator glows red and with a warning tone: “Please Charge”, please replace the battery or charge the battery in time. The radio will turn off automatically while battery is too low.
Via programmable software to set it: General Setting folder → Tone Alerts →RX low battery interval (sec)

PC Mode

At first, connecting the radio with computer by data line then turn on two-way radio; Secondly, start the software（BFP-DH500）that the data will be write or read by users.

Specifications

General	
FFrequency range	VHF:136-174 MHz /UHF:350-390 MHz UHF:400-480 MHz /UHF:450-520 MHz
Channel Capacity	160
Zones	32
Channel Spacing	12.5KHz/25KHz
Operating Voltage	DC 7.4V (±20%)
Battery capacity	2600mAh
Battery Life (5/5/90)	17 hours
Frequency Stability	±1.5ppm
Antenna Impedance	50Ω
Dimensions (L×W×H)	59 (L) *33 (W) *115 (H)mm
Weight	236g(including battery)

	Transmitter
CRF Output Power	High Power：7W Low Power：3W
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	AMBE3000
	Receiver
Digital Sensitivity	5% BER：0.25 uV
Analog Sensitivity	0.25 uV (12 dB SINAD)
Intermodulation	60 dB
Adjacent Channel Selectivity	60 dB
Spurious Response Rejection	70 dB
FM Noise	-40 dB
Audio Response	+1/-3 dB
Audio output power	1W
Audio Distortion	3% (Typical)
Conducted Spurious Emission	-36dBm
	Environmental Specifications
Operating Temperature	-20℃—+60℃
Storage Temperature	-30℃—+85℃
Humidity	MIL-STD-810C/D/E/F Standard
Vibration & Shock	MIL-STD-810C/D/E/F Standard

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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RECYCLABLE PACKAGING