

BelFone

www.belfone.com

BF - BP860
Digital FM Radio



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!

Founded in 1989, BelFone is a leading technology and solution provider of mission and business-critical communications, dedicated to bringing cut-edge communications technologies and empowering our customers with integrated radio solutions. With outstanding performance and excellent communication capabilities, BelFone products are the proper choices for mastering the overall situation and achieving intelligent dispatching and command delivery.

**This manual is applicable to
BP860 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.

- ◆It is recommended to use 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.
- ◆Don' t expose the radio to direct sunlight for a long periods of time. Also, don' t place the radio on sources of extremely heat, humid, 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 radio.
- ◆Use of the radio while driving may be against traffic laws in some countries, please check 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. Please find a certified technician to repair it.
- ◆If secondary development is required, please contact BelFone or the local dealer for technical assistance.
- ◆Please keep the surface of radio 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 radio, 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
AC Adapter	1
Charger	1
Li-ion Battery	1
User Manual	1

Antenna



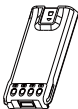
Strap



Belt Clip



Li-ion Battery



Charger



AC Adapter



Installation of Accessories

Installing / Removing the antenna

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

Turn the antenna anti-clockwise to remove it.



Installing/ Removing the Belt Clip

Align the belt clip with the groove on the back of the radio and press it down.



Attaching the Strap

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

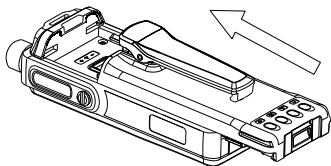


Attaching/Removing the Battery

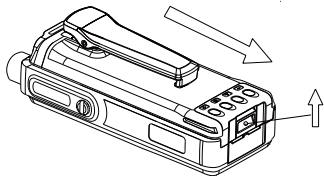
Warning!

- Do not short-circuit the battery, as this may cause damaged or catch fire;
- Never attempt to remove battery case, as this may cause battery short circuit;
- Batteries are flammable, 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 radio is powered 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 low, 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 charge 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 working 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 fault, please clean 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
Charging	Charge Indicator glows red
Fully charged	Charge Indicator glows green

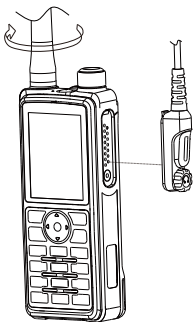
Charge Steps:

- 1.Plug the connector of the AC adapter into the AC outlet socket.
- 2.Place the battery or the radio 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.

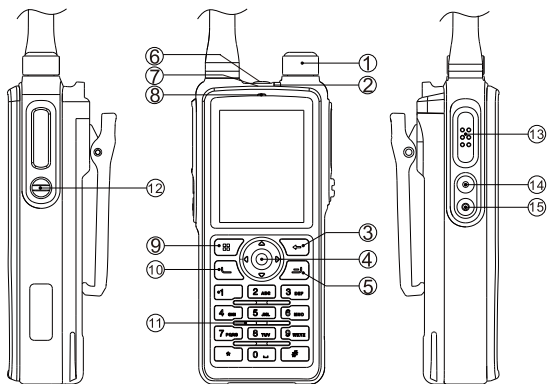
Note: While charging the temperature out of the limit the LED indicator of charger will flash red and green; If battery has damaged or battery is not connected to the charger correctly, the LED indicator of charger also will flash red and green.

Attaching the Speaker/Microphone

Rotate the screw of the accessory jacket cover counterclockwise to remove the accessory jacket cover, then align the plug with the accessory jacket and tighten the screw on the plug.



Getting Acquainted



①	Power switch/volume adjust keys	⑨	OK key
②	LED Indicator	⑩	P1 Key
③	Return Key	⑪	Speaker
④	Direction key	⑫	MIC-SP-USB Port
⑤	P2 Key	⑬	PTT Key
⑥	Orange Button	⑭	Side Button 1
⑦	MIC2 (Duplex mode)	⑮	Side Button 2
⑧	MIC1		

Basic Operation

LCD Icons

	Signal strength		Site roaming menu		Keypad locked
	High /Low TX power		Zone menu		All alert tones disabled
	Emergency		Settings menu		Voice call
	Scan on		Accessory menu		Recording
	Missed call		The inbox/outbox is full		Bluetooth
	Digital mode		Unread message		Duplex mode
	Private call		Monitoring		Half-duplex mode
	Group call		Connect to USB		Roaming on
	All call		VOX on		Battery level
	Contacts menu		Earphone is connected		Configured
	SMS menu		Positioning on		First priority scan channel
	Call log menu		Message read		Second priority scan channel
	Scanning menu		Message unread		Single frequency repeater
	Message send successfully		Message send failed		Ad Hoc mode
	Encryption on		Channel locked		

Turning the Power on /off

Long press the power switch/volume adjusting keys about 2 seconds to power on, the power on tone will sound.

Then long press the power switch/volume adjusting keys about 2 seconds to power off, the screen displays: power off.

Adjusting the volume

After the radio powered on, short press the power switch/volume adjust keys to switch the function of the key as volume mode, then rotate it to adjust the volume level, rotate the knob clockwise to increase the volume, or rotate the knob anti-clockwise to decrease the volume.

Note: Volume adjustment can only be performed when the default knob function is set as both or only volume by programming software.

Selecting a Channel

Short press the [power switch/volume adjust keys] to switch the function to channel mode then rotate it to select a channel. Rotate the knob clockwise to increase the channel number, or rotate the knob anti-clockwise to decrease the channel number. It can also press the direction key up or down to select a channel. While all tone alert is enabled ,change channel and a channel number will sound.

Note: Channel selection can only be performed when the default knob function is set as both or only channel by programming software.

Select a Zone

The radio supports up to 128 zones, each with a maximum of 64 channels, all 128 zones can support up to 1024 channels. Select a desired zone through zone menu or set zone selection function to orange button, button 1 or button 2, then handover zone. While all tone alert is enabled, select zone and a channel number will sound.

A/D Modes Switching

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

Note: Digital/Analog Switch function only switching the channel mode temporarily, restart the radio or rotate channel selector knob, the current channel will return to its default channel mode.

Voice Call

Each digital channel may initiate a private call, a group call or an all call. On analog channel press and hold down the PTT key to directly initiate call. On digital compatible analog channel press PTT key, if is not within hang time to set up digital call, within the hang time to call back. On analog compatible digital channel press PTT key, if is not within hang time to set up analog call, within the hang time period to call back. To transmit press and hold down the PTT key, LED indication glows red, speak into the microphone (In half duplex mode speak into microphone 1, and in duplex mode speak into microphone 2), hold the palm microphone approximately 3 to 4 centimeters away from mouth.

Private Call

If the feature “private call ACK” is enabled, the called needs to press the answer button before establishing the call

- (1) If a private call contact is preset for current digital channel., press PTT key to set up the private call;
- (2) Enter contacts menu to select the private call number, then press PTT key to set up the private call;
- (3) Enter manual dial menu under contacts menu, or in the home interface with keyboard allows input, directly input a private call number, then press PTT 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) Enter contacts menu to select the group call number, then press PTT key to set up the group call;
- (3) Enter contacts menu and go to manual dial menu, input a group call number, then press PTT 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

to set up the all call;

(2) Enter contacts menu to select the all call number, then press PTT key to set up the all call;

One Touch Call

In digital mode, users can set 0-9, * and # on the numeric keypad, and set private, group or all call contacts to the corresponding numeric keys. Long press the numeric keys to enter the call interface and then press "PTT" to directly initiate a call.

Duplex Call

The radio supports one-to-one full duplex call which the call initiator and receiver can simultaneously send and receive voice. Full duplex call only applies to private call, and the working channels of the transmitter and receiver must be configured for "voice duplex" working mode.

Reject Stranger Call

On digital mode, if reject strange call feature is enabled, while the call ID not exist in the contacts list, the call cannot be set up. When inputting a strange number to initiate a call, the radio will prompt that the number does not exist in the contacts. When a strange number calls in, the LED indicator light turns green, but there is no voice. (When receiving group calls or all calls, if the caller's device ID does not exist in the contacts , it cannot be accessed)

Receiving and Calling Back

On digital channel, while a private call is received, press the PTT key within the hang 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 hang 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 attach to CTCSS/CDCSS) simultaneously when receiving, and if matching signal is detected, within the hang time the current call can be called back.

Button Setting

For enhanced convenience, all the buttons in the configuration list can be programmed, short and Long press of a key can be assigned with different functions.

Programmable keys are including functions listed below:

NO.	Shortcut Keys	Description
1	Unassigned	Not assigned with any function
2	Emergency On	Send emergency information, only set short press on orange button
3	Emergency Off	Exit emergency mode, only set long press on orange button
4	TX Power High/Low	Switch High/Low Power quickly
5	Adjust Squelch Level	Switch squelch level as normally open, normal or tight
6	Alert Call	Quick access to Alert Call menu
7	Battery Indicator	Quick view battery capacity
8	Call Logs	Quick access to Call Logs menu
9	Channel Up	Quick select a channel
10	Channel Down	Quick select a channel
11	Location Data Upload	Quick send location data to center.
12	Frequent Contacts	Quick access to Frequent Contacts menu
13	Home Screen	Quick return to Home Screen
14	Boot Menu List	Quick access to Boot Menu List menu
15	Lone Worker On/Off	Enable or disable lone worker quickly
16	Man Down On/Off	Enable or disable man down quickly
17	Contact List	Quick access to Contact List menu
18	Message	Quick access to Message menu
19	Monitor On/Off	Enable or disable monitor quickly
20	Monitor Momentary	Enable or disable transient monitor quickly
21	Keypad Lock	Enable or disable keypad lock quickly
22	Squelch Open	Enable or disable squelch quickly
23	Transient Squelch Open	Enable or disable transient squelch quickly
24	Zone Up	Quick select a zone
25	Zone Down	Quick select a zone

26	Scan	Enable or disable scan quickly
27	VOX	Enable or disable VOX quickly
28	Encrypt	Enable or disable encryption quickly
29	Talk Around	Enable or disable talk around quickly
30	One Touch Call 1-5	Quick transmit group call/ private call/call alert or preset SMS
31	Manual Dial	Quick access to Manual Dial
32	Covert Mode	Enable or disable covert mode quickly
33	Priority Interrupt	Interrupt activity of current channel forcibly
34	Preset Channel 1~4	Quick select a preset channel
35	Delete Useless Channel	Temporarily ignore unused channel activity
36	Vibration Setting	Enable or disable vibration quickly
37	Record Sound On/Off	Enable or disable record quickly
38	Location On/Off	Enable or disable location quickly
39	Disconnect	Hang up current call quickly
40	Radio Check	Quick access to Radio Check menu
41	Remote Monitor	Quick access to Remote Monitor menu
42	Radio Disable	Quick access to Radio Disable menu
43	Radio Enable	Quick access to Radio Enable menu
44	Site Lock Switch	Quickly to enable or disable lock site function.
45	Manual Site Roam	Quickly to search the available site manually.
46	Digital/ Analog Switch	Temporarily switch channel mode to AD or DA
47	Single Frequency Repeater	Quickly to enable or disable Single Frequency Repeater function.
48	Ad hoc network	Quickly to enable or disable ad hoc network function.
49	Channel Lock	Quickly to enable or disable channel lock function.
50	Bluetooth On/Off	Enable or disable bluetooth quickly.
51	Noise Reduction	Enable or disable noise reduction quickly.
52	Phone Book	Quick access to Phone Book menu
53	System Status Query	On network channel, quickly check the radio network and position status.
54	Net On/Off	Quickly to enable or disable network function.
55	Disable All Switch	Quickly to enable or disable the mute function.
56	Board Trans Mode	Quick access to Back-to-Back Transmit Mode menu

Note:

The [orange key] is programmed as the emergency key by default, the short press of [up arrow key] is programmed as the channel up key by default, the long press of [up arrow key] is programmed as the zone up key by default; the short press of [down arrow key] is programmed as the zone down key by default; the long press of [down arrow key] is programmed as the zone down key by default; the short press of [OK key] is programmed as the root menu key by default; the short press of [Back key] is programmed as the home screen key by default;

Features not mentioned above may unsupported temporarily in the radio.

Functions and Operations

Contacts

Contacts list can contain a maximum of 1000 members, including private call, group call, all call. The contact menu includes frequent contacts, all contacts, new group or contacts, manual dial options.

1.Group Call

While the contacts type is Group Call, select the menu to view its ID or send message.

2.Private Call

While the contact type is Private Call, select the menu to view its detail, send control service, send message, edit name or number, delete. Control services are including:

Control Services	Description
Call Alert	Call alert is used for prompting the private receiver to respond the transmitter if communication is available.
Device Check	This function can check if the target radio is active in the system without sending any tone alert to the target device.
Remote Monitor	Allow a user to send a "Remote Monitor" request to the target device via menu. If the request is successful, the microphone of the target radio will be activated to monitor its activities.
Device Enable	Allow a user to send "Device enable" command to the killed radio and revive it.

Control Services	Description
Device Disable	Allow a user to send the Radio Disable command to a kill a radio , except remote monitor, all other functions will be disabled, The radio must be reprogrammed to restore or the radio receive “device enable” command to revive.
GPS Remote On	Allow a user to enable satellite positioning function of the target device via menu.
GPS Remote Off	Allow a user to disable satellite positioning function of the target device via menu.
GPS Remote Query	Allow a user to query satellite positioning information of the target device via menu.

- **Edit Name:** Modify the name of a private call contact. Press” *” key to delete, press “#” to switch input method, name input 16 characters at most.
- **Edit Number:** Modify the number of a private call contact, the available number range is 1~16776415. (if private call contact is set as channel default address or call number on one touch call, its unable to edit number)
- **Delete:** Delete unwanted contacts from the address list, if private call contact is set as channel default address or call number on one touch call, its unable to delete.

3. All Call

While the contacts type is All Call, select the menu to view its ID 16777215.

4.New Group

It allows to create a new group via menu, input the name then press confirm key to save, and it also allows to add contacts, edit the group name or delete it.

5. New Contact

It allows to add a private call or group call contact to the contact list. Firstly, input number, the available number range is 1~16776415; then edit name, press “*” key to delete, press “#” to switch input method, name input 16 characters at most. After adding a contact successfully, it will be found on contacts list.

6. Manual Dial

It allows to manually input the private number or group number for calling. On manual dial menu, press “*” key can switch input private or group number, then press PTT key to transmit.

Telephone

On the telephone book, it allows to view telephone contacts list, add new contacts, and manual dial. Contacts list can store up to 100 telephone contacts, which can be viewed, edited, or deleted. To make a telephone call, select the contact list or enter the contact number manually and then press the call out key to initiate the call. During the telephone conversation, press the number or symbol on the keyboard directly for secondary dialing.

Note: The telephone function is only supported in the SDC/SVT version.

SMS

1. New SMS


It allows to edit desired text message(255 characters at most) and send it to a Private Call contact or Group Call contact. When editing a message, press “#”key for switching input method, press “*” key for deletion and modification, press direction key to switch input cursor. For non-numeric input method, key “1” is a symbol key. Key “0” is a space key. After the message is edited, select a contact from the address list which the message is sent to or manually dial a number to send. It can also be stored in the draft box.

2. Preset SMS



Via programming software, user can save 10 text messages and each message contains 255 characters at most on preset SMS. The preset SMS can be temporarily edited before sending or directly sent.

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

3. Inbox

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

4. Outbox

Outbox can save up 20 sent messages. If the message is successful sent, it displays , and supports forward or delete operations; If the message is failed, it displays , and supports resend, forward or delete operations.

5. Draft box

Draft box can save up 20 sent messages, it supports edit, send or delete operations.

Call Logs

1. Outgoing Calls

The radio will record all recent private calls made in digital mode. The outgoing calls list can save up to 20 private calls, select an entry to view the details or add it to contact list or delete it.

2. Answered Calls


The radio will record all recent private calls received in digital mode. The answered calls list can save up to 20 private calls, select an entry to view the details or add it to contact list or delete it.

3. Missed Call

The radio will record all recent private calls missed in digital mode. The missed calls list can save up to 20 private calls, select an entry to view the details or add it to contact list or delete it.

Scanning

1. Scan On/Off

For scan to work, the current channel must be added to the scan list and the list must contain 2 channels at least. Scanning allows the radio to search the scan list connected to the current channel to locate qualified channel for receiving or voicing. If the scan list contains priority channel, the priority channel will be scanned more frequently than a non-priority channel. If the scan function is enabled, the icon  and scan group name appear on the home screen and LED indicator flashes red. When activities are detected on a channel, the radio will stay on the channel to receive current activities and LED indicator flashes green. If unwanted call is received on the channel, press the programmed [Nuisance Delete] key to remove the channel from the scan list temporarily. To exit the scanning process, enter scan menu, switch channel or press the programmed Scan key.


Note:

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

2. View / Edit

Allow a user to view/edit the scan list via menu. A user can view the scan group members or add a new member to the scan list, the list contain 16 channels at most. Also it allows to edit the members as priority channel, (1) indicates priority channel 1, (2) indicates priority channel 2, each scan list may contain two priority channels at most.

Roam

This feature allows the radio communicate between available sites in the IP Site Connection system. If enabled, the radio can communicate via any site in the IP Site Connection system, thus ensuring seamless communication in the system. After the feature enabled, the icon  will appear. On roaming channel, enter roaming menu to enable or disable it, set site lock or unlock, and start roam automatically.

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.

Zone

The radio supports up to 128 zones, a zone supports 64 channels, totaling 1024 channels support. Enter "Zone" menu to select a desired zone or press programmed [Zone Up] [Zone Down] key to select a zone.

Note: The radio contains 2 zones at least that you can switch the zone.

Settings

1. Settings


Allow a user to configure basic settings for the radio.

- Language:** The radio supports two languages: Chinese and English.
- LED indicator:** Allows a user to enable or disable the LED indicator via menu. All LED indicators including: TX LED, RX LED, Scan/ Roam LED, Low Battery LED, Call Hang LED.
- Backlight:** Set the backlight parameters, the radio supports three modes: on, off or automatic. while "automatic" is selected, the light will become dark within preset time not operating the key, and the light will keep on all the time when "on" is selected, the backlight will be disabled when "off" is selected.


●**Tone/Alerts:** Set tones and tone volume level for the radio, the following tones can be set:

Types	Description
Tone Disable	If tone disable is on, all alerts will be off except emergency alarm.
Call Out Tone	Off: The radio does not give any tone indication for transmission. On: The radio gives tone indication for transmission on both analog and digital channels; Analog: The radio gives tone indication for transmission on analog channel; Digital: The radio gives tone indication for transmission on digital
Voice End Tone	Set whether the radio will give tone indication when the radio ends receives voice.
Private Call Tone	Set whether the radio will give tone indication when the radio receives a private call.
Group Call Tone	Set whether the radio will give tone indication when the radio receives a group call.
Call End Tone	Set whether the radio will give tone indication when the radio releases PTT key and the hang time expires.
SMS Tone	Set whether the radio will give tone indication when the radio receives a message.
Call Alert Tone	Set whether the radio will give tone indication when the radio receives a call alert.
Prior Channel Tone	Set whether the radio will give tone indication when scan function is enabled and the radio receives activity on priority channel.
Keypad Tone	Set whether the radio will give tone indication when key is pressed.
Channel Tone	Set whether the radio will give tone of channel name when a channel or a zone is selected.
Low Battery Tone	Set whether the radio will give tone indication when the radio battery gets low.
Power On/ Off Tone	Set whether the radio will give tone indication when the radio turns the power on or off.
Emergency Alarm	Set whether the radio will give tone indication when the radio transmits or receives emergency information.

●**Vibration:** 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.

●**VOX:** While this function is enabled, users can enjoy hands-free communication. The radio will automatically begin transmitting when speaking, and terminate transmitting when stopping talking with no need of PTT press. Allow user to set the VOX level and VOX delay via menu. When VOX is on it indicates :  .

Note: The VOX feature is only activated by plugging in a headphone.

●**Keypad Lock:** Allow a user to enable or disable keypad lock via menu. While Keypad is locked it indicates:  , and keypad operation is not allowed . Press the key "OK +#" to unlock.

Note: The keyboard auto lock delay time can be set the programming software.

●**Man Down:** Enable or disable man down function via settings menu


●**Power-on Password:** If power-on password feature is enabled via programming software, the password can be modified by this menu. First input the old password correctly, then input a new password twice to modify the password successfully.

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

●**Boot Interface:** Allow a user to enable or disable the boot screen via menu. If the Intro screen is enabled, while the radio is power on, the screen displays Belfone Logo and device name; while the Intro screen is disable, the screen only displays device name.

●**Covert Mode:** If enabled, the radio will be totally silent without any UI indication.


●**Lone Worker:** Enable or disable lone worker function via settings menu

●**Talk Around:** When the repeater malfunctions, or the radio is out of repeater's range, communications can be continued in talk around mode. While enabled, the screen displays:  , by this time TX frequency will be set the same as to RX frequency. Switching channel, enabling scan feature or restarting radio will disable the feature.

Note:




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

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

- **Channel Lock:** Allow a user to lock the channel via the menu. If channel is locked, it indicates: , and remains in the current channel, rotating the channel knob cannot switch to other channels.
- **Noise Reduction:** Enable or disable noise reduction function via settings menu.
- **Set Date and Time:** View real time or modify the time via settings menu.

2. Channel Settings

Channel configure function is used to modify the current channel parameters, on digital channel, it is allowed to modify Channel Name, Sending Timeout, RX/TX frequency, Color Code, Slot Selection, Encrypt Setting, TX contacts, RX Group List, Single Freq Repeater and AD Hoc network.; on analog channel it is allowed to modify Channel Name, Sending Timeout, RX/TX frequency, Subsonic.

- **Channel Name:** Set current channel alias, it contains 16 characters at most.
- **TX Power:** Set current channel transmitting power level, high power indicates  and lower power indicates .
- **Sending Timeout:** Set current channel TOT, the available time range is 15 to 495(s), the time 0 is off.
- **TX/ RX Frequency:** Set TX or RX frequency of current channel, and only when current channel displays frequency that this option is available.
- **Subsonic:** Set the RX or TX subsonic type and values of current channel.
- **Color Code:** Set current channel color code, the available value range is 0~15, if TDMA direct mode feature is enabled, the color code range is 0~14.
- **Slot Selection:** Set current channel time slot, the available time slot is: Slot 1, Slot 2, Virtual Cluster TX slot Auto, Virtual Cluster TX slot 1, Virtual Cluster TX slot 2.
- **Encrypt Setting:** Set the encryption feature of current channel, if enabled, the icon  appears, and encrypt key can be manually typed or select from the encryption key list. When creating a new key, first edit the key name and then edit the key. The key name consists of Chinese characters, uppercase and lowercase letters, numbers or symbols, and the key is composed of uppercase and lowercase letters or numbers. The key length is 10 characters.
- **TX Contacts:** Select a contact from all contacts list as current channel default address.
- **RX Group List:** Set current channel RX group list.

●**Single Frequency Repeater:** Set current single frequency repeater feature, it can be enabled or disabled.



●**Ad Hoc Network:** Set current Ad Hoc network feature, it can be enabled or disabled it.

3. System Info

View the basic information of the radio, including battery status, RSSI, my number, device name, firmware version, CP version, UI version, Bluetooth information.

Accessory

1. Location


The transceiver supports GPS location and Beidou Satellite system which provides location data including time, date, longitude, latitude, speed, altitude, and number of available satellites. When location is enabled, the icon  appears, if effective location data is received the icon  appears, and if the set triggering conditions are met, the radio will transfer its positioning information automatically to the control center. The trigger condition contains: button, power on, power off, time, distance, boot password error, be remote monitor, be kill, PTT counts, connect counts. Location data also can be manually reported to an individual user via " Send GPS data" menu or the center by the programmed "Location data upload" key. The radio also supports querying location information of another radio if obtaining the query command.

Location data compressed feature: via the programming software the data compression feature can be enabled, which can reduce the capacity of data transmission and improve the efficiency of data transmission.

Note: Location is an optional feature.

2. Bluetooth

The radio supports Bluetooth audio mode and can connect to Bluetooth earphones for calls. When using Bluetooth earphones for the first time, pairing is required to connect them. The operation steps are as follows:
(1) Turn on the Bluetooth earphones and automatically enter a state of waiting for connection and pairing. At this time, the LED indicator lights will flash alternately in red and blue;

(2) Enter the Bluetooth link menu on the radio to search for devices, select the paired Bluetooth earphones, and after successful pairing, the status bar displays the earphone icon: . In the connected device information menu, users can view the names of the connected devices. Press the PTT button on the Bluetooth earphones to speak and transmit, or release the PTT button to receive voice.

Note: Bluetooth is an optional feature.

3. Voice Recording

When voice recorder is enabled, it will continuously record all transmitted and received signals. In the recording list menu, users can view or play the recording. In the shortcut search menu, the recordings can be searched based on the call type or date. Also it can be read to the programming software and played on the PC.


Note: Recording is an optional feature.


Emergency

Digital Emergency

In case of an emergency the user can enter emergency mode to ask for help. For each emergency mode, there are five emergency types and three emergency modes available.

Emergency Type:

Siren Only: The transceiver does not send emergency alarm. After the transceiver enters the emergency status, the siren only sounds locally, and the icon  appears.

Regular: The transceiver sends emergency alarm but no audio alert, and the icon  appears.

Silent: The transceiver sends emergency alarm but no audio/ visual alert, the speaker will be muted when receiving speech signal.

Silent with voice: The transceiver sends emergency alarm but no audio/ visual alert, when receiving speech signal the speaker will turn on to receive call.


Alarm Whistle: The transceiver sends emergency alarm, and alarm tone sounds locally.

Emergency Alarm Mode:

Emergency Alarm: The transceiver will exit emergency mode while ACK is received or the maximum retries expires it will.

Emergency Alarm with Call:The transceiver will remain in alarm and call mode while ACK is received or the maximum retries expires, and pressing PTT can transmit an emergency call.


Only Emergency Call: The transceiver enters emergency mode and remains on the emergency call interface, pressing PTT can transmit emergency all.

1.Initiating Emergency Alarm: Short press the orange button which is programmed as [Emergency On] to send emergency information, LED indicator glows red, the icon  shows in the status bar and LCD displays: Sending Alarm.

2.Initiating an emergency call: When the emergency mode is set as emergency alarm with call, after entering emergency state, press PTT key to initiate an emergency call, and the LCD displays: Emergency Call. If the Alarm with call to follow is enabled via the programming software, user can talk without having to press PTT key.

3.Exiting Emergency Alarm: The transmitter can long press the orange button which is programmed as [Emergency Off] to exit emergency state, or if the emergency alarm retry count is used up, the transceiver will exit alarm mode automatically in some alarm mode. The receiver can only long press the orange button programmed as [Emergency Off] to exit emergency mode.

Analog Emergency

Emergency alarm on analog channel only supports the emergency type of siren only. To enter emergency alarm state, short press the programmable button programmed as [Emergency On], the siren will sound locally and the icon  will show. Long press the programmable button [Emergency Off] to exit the alarm mode.


Lone 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.

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 degree 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.

Encryption

The encryption feature can encrypt the audio and data to guarantee the privacy of the communication, via the programming software encryption type can be set as XOR, enhanced XOR, ARC4 or AES256. XOR and enhanced XOR encryption only encrypt the audio . If the encrypt feature is enabled, icon  appears, the transmitter and receiver should be set as the same encryption type and same encryption key, otherwise the receiver cannot get the normal audio and data.

Note: This function is available only in digital operation.

TDMA Direct Mode

If enabled, 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.

Note: This function is available only in digital operation.

Pseudo Trunk


While slot is set as pseudo trunk, and one time slot is already occupied, it can transmit and receive on the other free time slot. If the pseudo trunk TX time slot is set as none, both time slot 1 or time slot 2 can transmit; if the pseudo trunk TX time slot is set as 1, press PTT key to transmit voluntary only in time slot 1; if the pseudo trunk TX time slot is set as 2, press PTT key to transmit voluntary only in time slot 2. The TX time slots set is invalid for replying

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

Direct Mode with Different Frequency

If direct mode feature is enabled, the radio 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 DM mode.

Single Frequency Repeater Feature


The radio supports single frequency repeater feature, with this feature enabled, the icon:  appears. The single frequency repeater feature allows the radio in direct mode to receive services on one time slot and then forwards them on the other, using the same frequency and code. In this way, the feature expands the communication coverage and saves frequency resources.

Note:

The voice frame check feature must be ticked of current channel if the single frequency repeater feature will be enabled;

If the single frequency repeater feature to current channel is enabled, the Ad Hoc network feature will not be available at the same time.

Ad Hoc Network Feature

The radio allows the user to enable the Ad Hoc network feature to expand the long distance transmission and coverage of radio's signal. With this feature enabled the icon:  appears, in this way, the current channel can't initiate a confirmed private call or other with acknowledge service.

Note:

The voice frame check feature must be ticked of current channel if the Ad Hoc network feature will be enabled;

If the Ad Hoc network feature to current channel is enabled, the single frequency repeater feature will not be available at the same time.

Ad hoc network is an optional feature.

Networking Feature

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 and normal digital emergency alarms, color codes, etc. Channel slot will be defaulted to pseudo trunk, transmitting slot defaulted to none, and priority interrupt defaulted to check.

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).

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

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 by pressing the alarm key. When track monitor is enabled, the radio will continuously send position information to the system according to the set polling time and minimum distance.

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

Radio Priority-Based Interrupt

The call priority feature is allowed to interrupt the on-going call on current forcibly. This means a higher priority call can interrupt other on-going calls with lower priority to release the channel for itself. There are 4 voice priorities available, level 1 is lower, level 3 is higher, and emergency call is the highest. Interrupt feature is divided into priority interrupt manually and priority interrupt automatically. The emergency priority interrupt, message priority interrupt, kill priority interrupt, all call priority interrupt belong to priority interrupt automatically.

- Priority Interrupt Manually:** Press the programmed [Priority Interrupt] key to terminate the ongoing activity on the current channel forcibly, so as to initiate a new call or a new service.
- Priority Interrupt Automatically:** In this way, the priority interrupt is triggered by the call priority level, if the priority level of current service is higher it will interrupt the ongoing activity automatically.
- Emergency Priority Interrupt:** If there is an active call on current channel, and a user with higher priority level to send emergency service will terminate the ongoing activity automatically.
- **Message Priority Interrupt:** If there is an active call on current channel, and a user with higher priority level to send a short message will terminate the ongoing activity automatically, so as to make sure the message is sent successfully.
- Kill Priority Interrupt:** If there is an active call on current channel, and a user with higher priority level to send kill command will terminate the ongoing activity automatically, so as to make sure the kill command is sent successfully.
- All Call Priority Interrupt:** If there is an active call on current channel, and a user with higher priority level to initiate an all call will terminate the ongoing activity automatically.

Note: This function is available only in digital channel.

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 be shorter. If the preset time expires, the radio will generate beep and terminate transmission automatically.

TX Permission

Digital Channel

This feature can restrict the channel to transmit if it is already in use. If "always" is set, whenever pressing PTT key the radio can 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 already in using the channel. If "channel free" is set, the radio will be unable to transmit on the channel if the channel is already in use. If the channel is busy, press PTT key a warning tone will sound.

Analog Channel

This feature is available in the analog mode and can restrict the channel to transmit if it is already in use. If "Off" is set, whenever pressing 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 being used by others; If "CTCSS/CDCSS" is set, the radio will be unable to transmit on the channel if a radio with the same the CTCSS/CDCSS code is in using the channel. If the channel is busy, press PTT key a warning tone will sound.

Voice With Location Information

When the transmitter is configured with the "voice with location information" function, location information will be sent simultaneously with the voice. When both sides have valid location data, the receiver's communication interface will display the transmitter's location information.

Noise Reduction

The noise reduction function can filter out environmental noise, accurately obtain human voices in noisy environments, so that the receiver can hear a clear and loud voice.


Battery Saver

This function allows an idler radio to automatically enter battery saver mode, which will extend battery service life, but response time may be delayed.

Low Battery Warning

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

Monitor

On analog or digital channel, if the Monitor feature is enabled, the icon:  appears. Press and hold down the programmed [Monitor Momentary] key to activate the monitor function, release the key to exit monitor mode; or press programmed [Monitor On/Off] key to enable the monitor feature, the radio will remain on monitor mode until press it again to exit.

Adjusting the Squelch Level

On the analog mode, the squelch threshold required for the radio to un-mute can be adjust . If two radios are at a close distance and the signals are strong, squelch level can be adjust higher; If two radios are at a long distance and the signals are weak, squelch level can be adjust lower, the appropriate squelch level depends on the ambient RF noise conditions.

Componder

The compander can be enabled only for analog channel, transmitted signals are compressed before being sent and received signals are expanded when received. This background feature allows higher clarity of signals, avoiding excessive noise.

CTCSS/CDCSS

On analog channel, unique CTCSS/CDCSS can be set to guarantee the privacy of the communication, 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 the transmitting radio is required for the radio to receive an incoming signal.

Decode: Only when the received call matching the decode, it can be heard;

Encode: The CTCSS/CDCSS will be attached to the signal before transmitting. The transmitting signal will only be heard by parties whose CTCSS/CDCSS signaling matches .

CTCSS Frequency Table

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

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			

Troubleshooting

	Phenomena	Solution
1	The radio cannot be powered on	Remove and reattach the battery ,then power the radio on.
		Recharge or replace the battery.
2	During receiving, the voice is weak, discontinuous or totally inactive.	Increase the volume level.
		Turn off the radio and reattach the antenna.
		Check the battery voltage, if the voltage is low please recharge or replace the battery.
3	The voice is unclear.	Modify the frequency to avoid be interrupted by radios using the same frequency.
		On analog channel, adjust the squelch level or set CTCSS/CDCSS
4	The noise is too loud	Move towards other members.
		Move to an open and flat area, and restart the radio.
		Stay away from equipment that may cause interference.
5	Cannot communicate with other members.	Set TX/RX frequency and signaling to the same as that of other members.
		Move towards other members.
		On digital channel, verity the device ID of transmitter and receiver are the same.
6	Cannot locate position	Move to an open and flat area, and restart the position feature.

Note: If the above solutions cannot fix the problems, or there are some other queries, please contact BrIFone or local dealer for more technical support.

Specifications

General	
Frequency range	VHF: 136-174MHz UHF: 400-480MHz UHF2: 450-520MHz UHF3: 350-400MHz
Channel Capacity	1024
Zones	128
Channel Spacing	12.5KHz/25KHz
Operating Voltage	DC 7.4V(±20%)
Battery capacity	2400 mAh (standard) 3350 mAh (optional)
Battery Life (5/5/90)	2400mAh (without GPS): Digital 21 hours, Analog 16 hours 3350mAh (without GPS): Digital 30 hours, Analog 23 hours
Frequency Stability	±0.5ppm
Antenna Impedance	50Ω
Dimensions (L×W×H)	62 (L) * 36(W)* 134 (H)mm
Display Screen	LCD screen, 320 * 240 pixels, 262000 colors, 2.4 inches, 10 lines
Weight	318.5g(include battery)
Transmitter	
RF Output Power	≤5W
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@12.5kHz/-45dB@25kHz
Conducted Emission	-36 dBm≤1GHz/-30 dBm≥1GHz
Adjacent Channel Power	≤-60dB
Audio Response	+1/-3 dB
Audio Distortion	≤5%
Digital Voice Coder Type	AMBE or Compatible NVOC
Receiver	
Digital Sensitivity	0.22μV /BER5%
Analog Sensitivity	0.22uV (12 dB SINAD)
Intermodulation	65dB@12.5/25kHz
Adjacent Channel Selectivity	60dB@12.5kHz/70dB@25kHz
Spurious Response Rejection	70dB@12.5/25kHz
FM Noise	40dB @ 12.5kHz; 45dB @ 25kHz
Audio Response	+1/-3 dB
Rated Audio output power	1.0W
Max Audio output power	2.5W
Audio Distortion	≤3%
Conducted Spurious Emission	-57dBm
Environmental Specifications	
Operating Temperature	-30°C~+70°C
Storage Temperature	-40°C—+85°C
ESD (electrostatic protection level)	IEC61000-4-2(Level 4) ± 8kV (contact discharge) ± 15kV (air discharge)
Humidity	MIL-STD-810H standard design
Vibration & Shock	MIL-STD-810H standard design
Dustproof & waterproof	IP68 standard design

Location	
Location System	GPS/ Beidou /GPS+ Beidou
Location Accuracy	<2.5m (CEP50, with well signal)
TTFF (Time To First Fix) Cold Start	≤ 30 Seconds (with well signal)
TTFF (Time To First Fix) Hot Start	≤ 1 minute (with well signal)

Note: All specifications are tested according to applicable standards, and subject to change without notice due to continuous development.

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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RECYCLABLE PACKAGING