BelFone

www.belfone.com

BP660

Digital FM Two-way 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
BP660 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

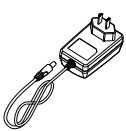
Items	Quantity
Antenna	1
Strap	1
Belt Clip	1
AC Adapter	1
Charger	1
Li-ion Battery	1
User Manual	1

Antenna

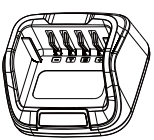
Strap

Belt Clip

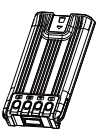
AC Adapter



Charger



Li-ion Battery



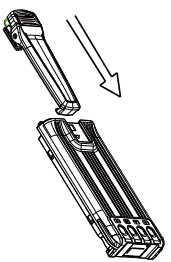
Installation of Accessories

Installing / Removing the antenna

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

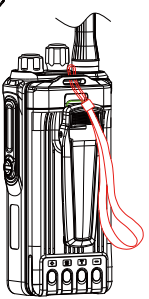
Installing/ Removing the Belt Clip

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 on the back of the radio.

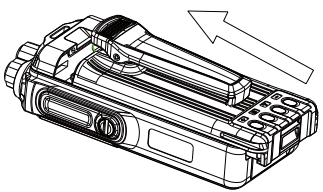


Attaching/Removing the Battery

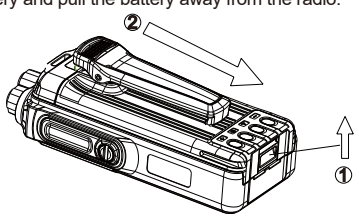
Warning!

- 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 rear of the radio, then push the battery upwards until a click is heard to lock it in place.



To remove the battery, please turn the power off then push the latch upwards 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 the new battery before use. If the battery power is low during use, 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 person bodily injury and property damage.

Battery Tips

1.When charging the battery, keep it at a temperature among 5℃— 40℃. 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 shorten than normal performance even if the battery is fully charged.

Extend Battery Life

1.The battery performance will be decreased under 0℃. 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

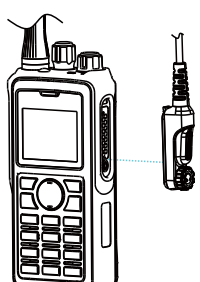
Charge Steps:

1.Plug the 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.

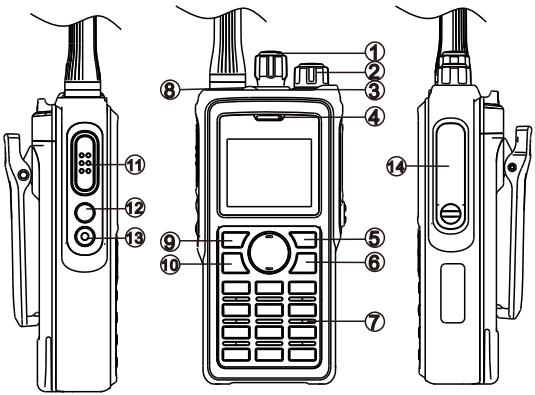
Note: While charging the temperature out of the limit the LED indicator of charger will flash red and green; If battery has damaged or battery is not connected to the charger correctly, the LED indicator of charger also will flash red and green.

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	Channel encoder	⑧	Orange Button
②	Power switch/Volume adjust keys	⑨	OK key
③	LED Indicator	⑩	Key P1
④	MIC	⑪	PTT key
⑤	Back Key	⑫	Key 1
⑥	Key P2	⑬	Key 2
⑦	Speaker	⑭	MIC-SP-USB Port

Basic Operation

LCD Icons

	Signal Strength		Unread Message		USB connected
H/L	High/Low TX Power		Inbox/Outbox full (Yellow)		Positioning on
	Digital Mode		Message sent		Recording on
	Analog mode		Message sent failed		Roaming on
	A&D mode		Message read		Battery level
	D&A mode		Message unread		Bluetooth on
	Individual Call		Missed call		Bluetooth PTT pairing successful (green)
	Group Call		Keypad Locked		Connecting
	All Call		Mute All		Weaken mode
	Scan		Emergency Alarm		Unregistered
	Encryption		VOX on		Registered
	Channel Locked		Direct/Talk around Mode		
	Monitor/Permanent Monitor		Earphone connected		

Turning the Power on /off

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

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

Adjusting the volume

After the radio powered on, rotate the power switch/volume adjust key 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

Rotate 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, change channel and a channel number will sound.

Note: While the channel is un-programmed, the LED will flash red slowly and a prompt tone "no channel " will sound.

Select a Zone

The radio supports up to 64 zones, each with a maximum of 16 channels, all 64 zones can support up to 1024 channels. Select a desired zone through zone menu or set zone selection feature to the programmable button, then change 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 the programmed 【Digital/Analog Switch】 key to switch to channel mode. If the current channel is D/A mode, press the key to switch to A/D mode. If the current channel is A/D mode, press the key to switch to D/A 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 individual call, a group call or an all call. On analog channel press and hold down the PTT key to directly initiate a call. On digital compatible analog channel press PTT key, if is not within hang time to set up a 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, hold the palm microphone approximately 3 to 4 centimeters away from mouth.

●Individual Call

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

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

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

（3）Enter manual dial menu under contacts menu, or in the home interface with keyboard allows input, directly input a individual call number, then press PTT key to set up the individual call;

（4）Enter call log menu and select the individual call number, then press PTT key to set up the individual call;

（5）Set a individual call contact to the one touch key, then press PTT key to set up the individual 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 manual dial menu under contacts menu, or in the home interface with keyboard allows input, press the # key to switch to the group call type and input a group call number, then press PTT key to set up the group call;

（4）Enter call log menu and select the group call number, then press PTT key to set up the group call;

（5）Set a group call contact to the one touch key, 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 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;

（3）Enter call log menu and select the all call number, then press PTT key to set up the all call;

Long Press Key Call

In digital mode, users can set 0-9on the numeric keypad, and set individual call, group call 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 or send a pre-set message.

Receiving and Calling Back

On digital channel, while an individual call is received, press the PTT key within the hang time to set up the individual call and then to talk each other. If there is not respond to a received individual 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	Undefined	Not assigned with any function
2	One Touch Call 1~6	Quickly transmit group call/ individual call/call alert or preset SMS
3	Preset Channel 1~4	Quickly select a preset channel
4	Emergency On	Send emergency information, only set short press on orange button
5	Emergency Off	Exit emergency mode, only set long press on orange button
6	Monitor	Enable or disable monitor quickly
7	Permanent Monitor	Enable or disable permanent monitoring quickly
8	Keypad lock	Enable/disable keypad lock quickly.
9	Battery Indication	Quick check to battery capacity.
10	Current Date Prompt	Quickly access to Date menu

NO.	Shortcut Keys	Description
11	Zone Toggle	Quickly select a zone
12	Priority Interrupt	Interrupt activity of current channel forcibly
13	AD Switch	Temporarily switch channel to AD or DA mode
14	Power Switch	Switch High/Low Power quickly
15	Repeater/Talk Around	Enable or disable talk around quickly
16	Nuisance Delete	Temporarily ignore unused channel activity
17	Radio Enable	Quick access to Radio Enable menu
18	Radio Disable	Quick access to Radio Disable menu
19	Radio Check	Quick access to Radio Check menu
20	Remote Monitor	Quick access to Remote Monitor menu
21	Backlight Auto On/Off	Quickly switch the backlight to automatic or always-on mode.
22	All Alert tones On/Off	Quickly enable or disable the mute function.
23	Scan On/Off	Enable or disable scan quickly
24	VOX On/Off	Enable or disable VOX quickly
25	Location On/Off	Enable or disable location quickly
26	Record On/Off	Enable or disable record quickly
27	Lone Worker	Enable or disable lone worker quickly
28	Upend On/Off	Enable or disable man down quickly
29	Roam On/Off	Enable or disable roam quickly
30	System Status Query	On network channel, quickly check the radio network and location status.
31	Site Lock On/Off	Quickly enable or disable lock site function.
32	Manual Site Roam	Quickly search the available site manually.
33	Covert Mode	Enable or disable covert mode quickly
34	Encrypt Enable	Enable or disable encryption quickly
35	Bluetooth Switch	Enable or disable bluetooth quickly.
36	Channel Lock	Quickly enable or disable channel lock function.
37	Noise Reduction	Enable or disable noise reduction quickly.
38	Disable All LEDs	Enable or disable all LEDs quickly
39	Manual Dial	Quick access to Manual Dial

40	Contact List	Quick access to Contact List menu
41	Telephone Contact	Quick access to telephone contact list menu
42	Message	Quick access to Message menu
43	Root Menu	Quick access to root menu
44	Back to Main Interface	Quick return to home screen

Functions and Operations

Contacts

Contacts list can contain a maximum of 1024 members, including individual call contact, group call contact and all call contact. The contact menu includes contact list, contact group, manual dial, new contact, contact group configuration options.

1.Group Call

While the contacts type is Group Call, select the menu to view its detail, send message, edit name or number, delete the contact, join in or exit the contact group.

2.Individual Call

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.
Device Disable	Allow a user to send “Radio Disable” command to a kill a radio , except remote monitor, all other functions will be disabled, The radio must be reprogrammed or receive a “device enable” command to revive.

●**Edit:** Modify the name or number of an individual call contact. When editing, press” *" key to delete, press “#” to switch the input method, the available number range is 1~16776415, name input 16 characters at most.

●**Delete:** Delete unwanted contacts from the address list, if individual call contact is set as channel default address or call number on one touch call, it's unable to delete.

3.All Call

While the contact type is All Call, select the menu to view its ID 16777215, join in or exit the group.

4.Manual Dial

It is convenient for calling private or group contacts not in the contact list. On manual dial menu, press the # key to switch the call type between private and group, then input the ID code and press PTT to initiate the call, or press the OK key to send a message. For private contacts, users can also perform operations such as call alert, radio check, remote monitor, radio enable, and radio disable.

5.New Contact

It allows to add an individual call or group call contact to the contact list. The available number range is 1~16776415, name input 16 characters at most. When editing, press "*"key to delete, press "#" to switch input method, press OK key to save. After successful saving, the newly added contact will be found in contacts list.

6.Subgroup Configuration

It allows to create a new subgroup, edit the subgroup name or delete the subgroup via menu. Select "New contact subgroup" option, enter the subgroup name and press the OK key to successfully create it. Up to 16 contact subgroups can be created.

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.

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 feature 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 and turn off scanning, 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 list members or add a new member to the scan list, the list contain 16 channels at most. It's not allowed to create new scan lists or delete existing scan lists via the menu. Digital channels and analog channels can exist in the same scan list.

Site Roam

The feature allows the radio to communicate between available sites in the IP Site Connection system. It can only be configured through the menu after adding a roaming list to the current channel.

1. Site Roaming on/off

AThe roaming feature can only be enabled if the roaming list contains at least two channels and the screen will display the icon . When roaming, the radio will automatically search for valid sites and switch to the channel for communication. When roaming is disabled, the radio will voice prompt: "Roaming off" and exit the automatic roaming feature.

2. Lock/Unlock Site

When the site is locked, the radio will be locked in the current channel and will not automatically roam to other valid sites.

3. Manual Site Roam

When manual site roaming is enabled, the radio will search for the next valid site and switch to that channel.

4. View/Edit List

Users can edit the roaming list through the menu. In the "View Members" menu, users can view all members in the current roaming list or remove a channel from the roaming list. The "Add Members" menu allows users to add new roaming members to the current roaming list, with each list containing up to 16 channels. Creating new roaming lists or deleting existing ones is not allowed via the radio menu. Only channels with different frequencies and enabled for "IP Site Connection" can be added to the roaming list.

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 64 zones, a zone supports 16 channels, totaling 1024 channels support. Enter “Zone” menu to select a desired zone or press programmed [Zone Toggle] key to select a zone.

Note: Zone switching is only possible when the radio contains 2 zones or more.

SMS

1. New SMS

It allows to edit desired text message and send it to an individual 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 contact list which the message is sent to or manually dial a number to send.

2. Inbox

The Inbox can save up to 30 received messages, and a (/) is displayed behind the inbox menu. The number in front indicates the number of unread received messages, and the number behind indicates the total number of messages in the inbox. In Inbox the unread message displays: , read message displays : . For each message, it can perform any of these operations: Reply, Forward and Delete.

3. Preset SMS

Via programming software, user can save 10 text messages and each message contains 140 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

4. Outbox

Outbox can save up 30 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. Delete All

It is used to delete all messages in the inbox or outbox at once. The “Delete all” option will simultaneously delete all messages in the inbox and outbox, but pre-set messages will not be deleted.

Call Logs

1. Missed Call

The radio will record all recent missed individual calls in digital mode. The missed calls list can save up to 10 individual 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 received individual calls in digital mode. The answered calls list can save up to 10 individual calls, select an entry to view the details or add it to contact list or delete it.

3. Outgoing Calls

The radio will record all recent individual and group calls in digital mode. The outgoing calls list can save up to 10individual calls, select an entry to view the details or add it to contact list or delete it.

4. Clear Record

It is allowed to separately clear missed calls, answered calls, and outgoing calls. The “Clear all” option will simultaneously clear all call records.

Settings

1. Settings

●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 is enabled, the screen displays: , the TX frequency will be set the same to the RX frequency. Switching channel, enabling scan feature or restarting radio will disable the feature.

Note:

To enable this feature, 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 [Repeater/Talk Around] key to switch DM mode and RM mode.

●**Tone/Alerts:** It is allowed to enable or disable the tones including call alert tone, message tone and keypad tone. If "All tones" option is set to off, the radio will be mute including the voice prompt, but the alarm tones can still be played normally.

●**TX Power:** Set current channel transmitting power level, high power displays: H and lower power displays: L.

●**Backlight:** It controls both the screen and keypad lights. If "automatic" is selected, the light will turn off within preset time not operating the key. If "on" is selected, the light will keep on all the time.

●**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 disabled, the screen only displays device name.

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

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

●**Channel Lock:** Allow a user to lock the channel via the menu. If channel is locked, it displays: , and remains in the current channel, rotating the channel knob cannot switch to other channels.

●**LED Indicator:** Allows a user to enable or disable the LED indicator via menu. If it is set to off, both the backlight and keypad lights will be disabled, and the LED indicators for transmitting, receiving, scanning, roaming and other operations will not light up.

●**VOX:** While VOX is enabled and the earphone is plugged in a, the radio displays: ◉, 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.
Allows the user to enable the voice control function and set the voice control delay through the menu, can select the voice control level 1~8 or disable; The voice delay can be set to 0.5 to 10 seconds, and the step value is 0.5 seconds. Plug in the headset and turn on the voice control function, the screen shows: ◉
Note: The VOX feature is only activated by plugging in an earphone.
●**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.
●**Language:** The radio supports two languages: Chinese and English.
●**Location Switch:** The radio supports three modes: Off, power-saving, and high-performance. In power-saving mode, the battery life can be extended. When the location feature is enabled, the radio displays:.
●**RTC Configure:** View real time or modify the time via settings menu.
●**De-noise:** Enable or disable noise reduction feature via settings menu.
●**Alias Display:** Enable or disable alias display feature via settings menu.
●**Alias Edit:** Edit alias via settings menu.
●**Theme Choose:** The display style can be set to default theme, light yellow, light blue, or light green.

2. System Info

View the basic information of the radio, including battery status, my number, firmware version, hardware version, serial number, record version, location data, sending location message. RSSI indicate, date time, etc.

3. Channel Configure

Channel configure feature is used to modify the current channel parameters, on digital channel, it is allowed to modify RX/TX frequency, Channel Name, Sending Timeout, TX contacts, Color Code, Slot Selection and RX Group List,; on analog channel it is allowed to modify RX/TX frequency, Channel Name, Sending Timeout, Subsonic.

Note: The modified parameters will only be saved to the radio after exiting the interface.

Voice Recording

1. Voice Recording Configure

When voice recorder is enabled, the radio will display and continuously record all transmitted and received signals.

2. Voice Records

In the recording list menu, users can view or play the recording. Also it can be read to the programming software and played on the PC.

Note: Recording is an optional feature.

Bluetooth

1. BT Switch

The radio supports Bluetooth feature and can connect to a Bluetooth earphone or Bluetooth PTT for calls. When the Bluetooth feature is enabled, the radio displays .

2. My Device

View the Bluetooth address, version, as well as view or modify the Bluetooth name.

3. Earphone

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 “Search Earphone” menu on the radio to search for devices and select the paired Bluetooth earphones via the “Search List” menu. After successful pairing, the radio displays: . Users can view the connection history via the "Paired Devices" menu and view the names of the connected device via the “Connected Device” menu. Press the PTT button on the Bluetooth earphones to speak and transmit, or release the PTT button to receive voice.

3) Disconnect the Bluetooth earphone connection in the "Exit Pairing" menu.

4. PTT Pairing

When using Bluetooth PTT for the first time, pairing is required to connect them. The operation steps are as follows:

1) Turn on the Bluetooth PTT 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 “PTT Pairing” menu on the radio to search for devices, and after successful pairing, the radio displays . In the “PTT Info” menu, users can view the names and battery level of the connected devices. Press the PTT button to speak and transmit, or release the PTT button to receive voice.

When the PTT keep feature is enabled, it is not need to long press the PTT during the call. Press the PTT once and release it to enter and maintain the transmitting state, and press the PTT again to exit the transmitting state.

Note: Bluetooth is an optional feature.

Digital Emergency

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

Emergency Type:

Regular: The radio sends emergency alarm and continuously plays the audio alert.

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

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

Emergency Alarm Mode:

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

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

Emergency Alarm with Voice: Once the "Emergency Alarm" button is pressed, an emergency alarm will be sent, and the radio can automatically transmit voice without pressing PTT. The duration of voice transmission can be set through programming software.

1. Initiate Emergency Alarm

If the current channel adds emergency system and is set as the emergency revert

channel, press the programmed “emergency on/off” key to send alarm information, LED indicator glows red, the radio displays icon ⚠ in regular type.

2. Exit emergency mode

Long press the transmitter programmable button which is programmed as "Emergency Off" to exit emergency state. In regular type and emergency alarm mode, when ACK command is received or the alarm cycles expire, the radio will exit the emergency mode automatically. In silent or silent with voice type, pressing PTT key can also exit the emergency mode.

3. Receive Emergency Information

When the feature” emergency alarm indication” is enabled, if receiving emergency information, the radio will display icon ⚠, the transmitter’s ID and name, an alarm tone will sound.

Lone Worker

This feature 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.

Location

The radio supports the satellite location mode of GPS, Beidou, GLONASS and Galileo, which provides location data including time, date, longitude, latitude, speed, altitude, and number of available satellites. When location is enabled, the radio will transfer its location information automatically to the center if call counts or PTT counts is reached. Location data also can be manually reported to an individual user via "Send Location SMS" menu.

●Query Location information of another radio user

①Radio A enables location feature and set location query command as: ABC

②Radio B enters New SMS menu and edits text message:”ABC” then sends to radio A.

③Radio A receives message from radio B, then sends location data to radio B automatically.

④If radio A location data is invalid, the radio B will receive: No location Data.

Note: Location is an optional feature.

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, AES256, advance ARC4 or advance AES256. XOR , enhanced XOR, ARC4 and AES256 encryption only encrypt the audio . If the encrypt feature is enabled, the radio displays , 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 feature is available only in digital operation.

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. In "SDC" mode, the channel will not support scanning, roaming and normal digital emergency alarm features. 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 pesudo trunk, transmitting slot defaulted to none, and priority interrupt defaulted to check.

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

SDC/SVT supports system emergency alarm, which can be set in the patrol system.

Local Call

The local call can be effective only when the network feature is enabled in digital channel. When the local call is checked, 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 feature in online status. When emergency alarm is enabled, the radio will automatically send voice and location information to the system by pressing the alarm key. When track monitor is enabled, the radio will continuously send location 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.

TDMA Direct Mode

If it is 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 feature 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 feature at the same time.

SVT

The standby interface of the SVT channel is different from regular channels. The first line displays the name of the belonging group, the second line displays the current channel name, the third line displays the current region name, and the fourth line displays the current networking status.

After entering the pesudo trunk channel, the radio will login its belonging group. If registration fails, there will be a voice prompt of "login rejected". Registration can be initiated again after restarting or switching channels. After successful registration, a voice prompt of "single site", "multi site offline", "disconnection mode", "multi site IP connect", and "network mode" will be displayed based on the site type and whether the controller is connected. If it is currently in "weaken mode", the voice prompt will be "weaken mode".

Networking Status:

Connection Status	Site type	Standby interface (fourth line)	Status Icon
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 site 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
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 select a contact via the menu to transmit the call. The hang time of individual and group calls is controlled by the system. All calls do not support call back, and releasing PTT will end the call.

When pressing PTT to transmit a belonging group call, if the belonging group is already 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 Setting

This is to set the belonging group and cross station roaming list for the radio on the pesudo trunk channel. After entering the pesudo trunk channel, the radio will login its belonging group. When the authentication feature of the repeater which the radio is belonging to 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.

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 0 is lower, level 3 is higher, and emergency call is the highest.

To transmit the Priority Interrupt command, press the programmed [Priority Interrupt] key to make the channel free for new call or message transmission.

Note: This feature is available only in digital channel.

Voice with Location Information

When the transmitter is configured with the "voice with location information "feature, 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.

Alias Display

The radio supports alias display feature. When receiving a call from a contact not in the contact list, the sender's device alias will be automatically displayed, and the stranger can be automatically added to the contact list.

Time Out Timer (TOT)

The purpose of TOT is to prevent any user from occupying a channel for an extended period. If a busy channel, the time will be set 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.

Reject Stranger Call

On digital mode, when reject strange call feature is enabled, the radio can successfully receive the call only if the device ID and call ID of the transmitter exist in the contact list.

Covert Mode

When the convert mode is enabled, the backlight, LED indicator light and all sounds will be disabled, but an earphone can be connected to receive voice. When the convert mode earphone mute is enabled, the connected earphone will also not be able to hear voice.

Noise Reduction

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

Battery Saver

This feature 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, 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.

Battery Detect

When the radio is powered on, it will automatically detect whether the battery is an original one and pop up a window to prompt "Original Battery". If it is detected as a non-original battery, the radio will not be able to display the battery level normally and will pop up a window to prompt "Non-original Battery" at regular intervals.

Monitor

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

Analog Channel

In analog mode, the following options are available in the radio menu: scanning, zone, settings, recording and bluetooth. The operations are the same as those of digital mode but the settings menu has a squelch level adjustment feature.

●**Squelch Level:** Adjust the squelch threshold for received signals. This feature filters out incoming signals that are not strong enough to produce clear voice, thereby eliminating unwanted noise. The squelch level can be selected from 0 to 9. The higher the squelch level, the stronger the received signal strength is required.

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 matched .

CTCSS Standard 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			

Specifications

General	
Frequency range	VHF：136-174MHz/ UHF1：400-480MHz UHF2：450-520MHz/ UHF3：350-400MHz
Channel Capacity	1024
Zones	64
Channel Spacing	12.5KHz/25KHz
Operating Voltage	DC 7.4V(±20%)
Battery capacity	2000 mAh
Battery Life（5/5/90）	Digital 22 hours, Analog 16 hours
Frequency Stability	±1.5ppm
Antenna Impedance	50Ω
Dimensions (L×W×H)	60(L)*38(W)*125 (H)mm
Display Screen	1.77inches, 10 lines
Weight	316g(include battery)
Recording (optional)	250 hours
Bluetooth (optional)	BT5.0
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
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	0.25μV /BER5%
Analog Sensitivity	0.25uV (12 dB SINAD)
Intermodulation	60dB
Adjacent Channel Selectivity	60dB
Spurious Response Rejection	60dB
FM Noise	-40dB
Audio Response	+1/-3 dB
Rated Audio output power	1.0W
Max Audio output power	1.5W
Audio Distortion	3%
Conducted Spurious Emission	-57dBm
Environmental	
Operating Temperature	-20℃～+60℃
Storage Temperature	-30℃—+85℃
Humidity	MIL-STD-810H
Vibration & Shock	MIL-STD-810H
Dustproof & waterproof	IP68
Location	
Location Accuracy(optional)	Horizontal position accuracy ＜2.5m（with well signal）
TTFF (Time To First Fix) Cold Start	＜30Second （with well signal）
TTFF (Time To First Fix) Hot Start	＜1 Second （with well signal）

Note: The above specifications are tested according to trial standards. Due to continuous technological advancements, the data provided are for reference only.

Statement

In the process of compiling this manual, we have strived for accuracy and completeness in its content.. 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.

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RECYCLABLE PACKAGING