BelFone

www.belfone.com

BF-500

Analog 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.

Acknowledgement!

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

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

UHF Transceiver Model: BF-500

Warning!

◆In explosive environment (inflammable gas, dust powdery particles, etc.), please turn the power off.

Instructions before Use

It's important for the operator to understand the hazards common with the operation of the radio. Please observe the following safety precautions to prevent radio damage or personal injury. These precautions shall be observed during operation, service and repair of this radio.

◆The recommended usage rate is 1 minute for TX and 4 minutes for RX. When the radio is used in the transmission mode for many hours, the chassis will become hot. Allow the rear panel of the radio to contact a surface of low melting point /low Ignition point;

◆Do not leave the transceiver in direct sunlight for a long time. Also, don' t place the transceiver on sources of extreme heat, damp, dust, or unstable surfaces;

◆When you are in areas with restriction or warnings about the use of radio devices, please obey the regulation and turn off the transceiver.

◆Use of the radio while driving may be against traffic laws in some countries. Please check your local traffic laws before using the radio while driving;

◆If you notice any problems on the radio, please turn off immediately. Then contact your local dealer/technician. Do not modify this radio unless instructed by this manual. Refer to a certified technician only for servicing

◆If you want to use the transceiver for secondary development, please contact PMTL or your 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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Supplied Accessories

Notes: The accessories listed below are supplied by BelFone dealer, authorized BelFone agents and dealers.

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

Accessories

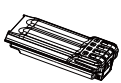
Items	Quantity
Antenna	1
Strap	1
Belt Clip	1
Charger	1
Li-ion Battery	1
Screws	1
User Manual	1
Warranty Card	1
Certificate	1

Antenna

Strap

Charger

Li-ion Battery



Belt Clip

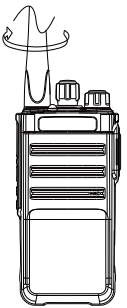
Screws

Install of Accessories

Installing/ Removing the Antenna

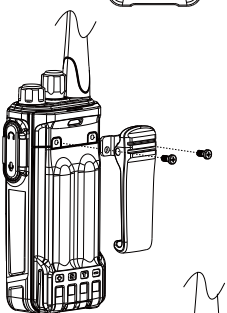
Hold the supplied antenna by its base, then screw it into the connector on the top panel of the radio until fasten.

Turn the antenna anti-clockwise to remove it.



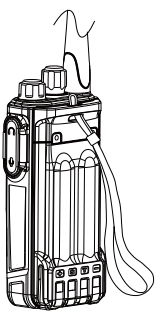
Installing/ Removing the belt clip

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



Attaching/Removing the strap

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

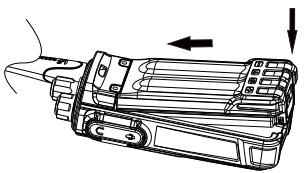


Attaching/Removing the Battery

Warning!

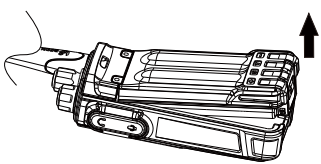
- Don't short-circuit the battery, it may cause the battery to be damaged or explode;
- Never attempt to remove the battery housing, to avoid short circuiting the battery terminal;
- Dispose an exhausted battery properly. Do not dispose it in an open flame or highly flammable environment.

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



To remove the battery, please turn off first then raise the release latch upwards to unlock the battery and pull the battery away from the radio.

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



Battery Information

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

Applicable Battery

To reduce the risk of injury, please use only approved battery and charger specified by BelFone.

Battery Tips

● When charging your battery, keep it at a temperature between 5°C - 40°C to avoid damage to the battery.
● Extreme temperatures may cause battery leakage or damage.
● When charging a battery attached to a radio, turn the radio off to ensure efficient charging.
● Do not cut off the power supply or remove the battery while charging a battery.
● Never charge a battery that is wet, ensure the battery is dry prior to charge.
● If the battery is full charged and the operating time is noticeably shorter than normal, it is time to buy a new battery

To Prolong Battery Life

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

Battery Storage

1. Fully charge a battery before you store it for a long time, to avoid deep battery discharge due to storage.
2. Recharge a stored battery intermittently after every few months of storage, to avoid battery capacity reduction due to discharge. (NI-MH batteries: 3months, Li-Ion& Li-polymer batteries: 6 months).
3. Store your battery in a cool, dry place under room temperature, to reduce self-discharge.

Charge the Battery

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

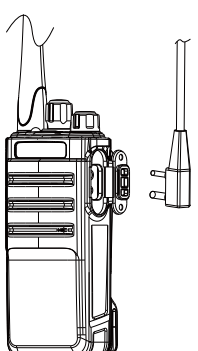
Charger Status	Charger Indicator
Standby(No-load)	Charge Indicator glows green
Battery is charging	Charge Indicator glows red
Battery is fully charged	Charge Indicator glows green

Charge Steps:

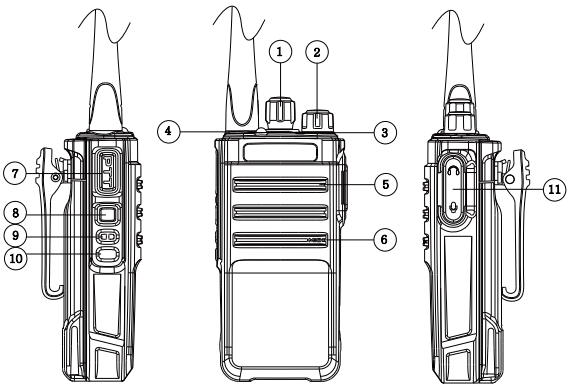
1.Plug the AC connector of the switching power into the AC outlet socket.
2.Place the battery or the radio is attached with a battery in the charger.
3.Make sure the battery is connected to the charger, and the charging process initiates when the charger indicator glows red.
4.The charger indicator glows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

Attaching the Speaker/Microphone

Open the accessory cover plug the speaker/microphone firmly into the accessory jack.



Getting Acquainted



①	**Channel Encoder**	⑦	**Main PTT Key**
②	**Power switch/volume adjust keys**	⑧	**Sub PTT Key**
③	**LED Indicator**	⑨	Side Button 1: press and hold down the key to enable monitor feature, release the key to disable it.
④	**Lamp**	⑩	Side Button 2: Short press to switch lamp modes; long press to switch scanning on/ off,
⑤	**Speaker**	⑪	**MIC-SP Jack**
⑥	**Microphone(MIC)**		

LED Indicator Status:

LED Indicator	Working Status
Glow Green	Receiving
Glow Red	Transmitting
Flash green internal 0.5 second	Scanning
Flash green internal 8 second	The battery capacity is sufficient
Flash red internal 8 second	The battery capacity is insufficient

Basic Operation

Power on /off

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

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

Adjusting the volume

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

Note: you can press [side button 1] then according the background noise to adjust the volume to a comfortable audio out level.

Selecting a Channel

●Main Channel Selection

Turn the channel selector knob to select channel 1 through 16, rotate the knob clockwise to increase the channel number, or rotate the knob anti-clockwise to decrease the channel number.

●Sub Channel Selection

Press two side buttons at the same time to enter sub channel selection mode, and you will hear a voice of current sub channel number, then press [side button 1] to increase the channel number or press [side button 2] to decrease the channel number, and press PTT key to confirm. Also, you can set sub channel via programming software.

Note:

1. You should input TX and RX frequency on programming software. You will hear a long tone alert if PTT key on unprogrammed channel is pressed. If the main channel and sub channel is unprogrammed , you will hear an alert tone if PTT key is pressed.

2. You can enable or disable the sub channel via the programming software. If the sub channel is disabled, only the main channel is available. The default setting is enabled.

Call

To call on main channel, press and hold down the main PTT key, and then speak to the microphone or press and hold down the sub PTT key to transmit on sub channel. Please hold the radio about 3 to 4 centimeters away from your mouth, and speak at normal voice level. When transmitting LED indicator glows red, release the PTT key to receive.

Receiving and responding to a call

The transceiver works on dual receiving mode. If the receiving signal is on the main channel or sub channel, LED indicator glows green, and you can press PTT key within the preset time period(1~5 seconds) to call back.

● When the weak signals are received and the radio sets high SQL, the receiving party will fail to receive incoming calls.

● Your dealer may set CTCSS/CDCSS for your radio. When the channel you chose is set CTCSS/CDCSS, the user can only receive the calls on the same channel with the same CTCSS/CDCSS.

Introduction to Functions and Operations

Voice Prompts

Voice prompts allows you to hear a sound of the new channel number when you are changing the channels.

Squelch Level

Squelch feature allows you to adjust the squelch threshold required for the radio to un-mute. If the squelch level is 0, the speaker is un-muted in any condition to receive any sound on the current channel. You can set squelch level as 1~9 via programming software, and level 3 is set to its default setting.

Low Battery Warning

When your battery gets low, LED indicator glows red and with a warning tone: “Please Charge”, please replace the battery or charge the battery on time. The radio will turn off automatically while battery is too low.

Note：You can enable or disable the low battery warning indicator via the programming software, the default setting is enabled.

Battery Saver

This function allows an idler radio to automatically enter battery saving mode, the mode will extend battery service life. Via programming software you can set battery saver time ratio as: 1:1, 1:2, 1:3, 1:4, 1:5, the smaller the time rate, the more power saved evidently.

Busy Channel Lockout (BCL)

This feature allows you to avoid interference between radios transmitting on the same channel. Via the programming software you can enable the BCL function. If the channel is already in use, press PTT the radio to generate a warning tone and the transmission will be disabled.

Flashlight

There are three flashlight modes: normal, flashing and SOS mode (three short lights, three long lights, three short lights of the cycle). Short press [side button 2] and the flashlight keeps on. Short press [side button 2] again to switch flash mode, and short press [side button 2] to switch to SOS mode. The final short press will turn off the flashlight.

Scan

Scan is useful for monitoring signals on the radio channels. During scanning, the radio checks for a signal on each channel and only stops on a channel if a signal is detected. When a signal is detected on a channel, Scan pauses on that channel. The radio will remain on the busy channel until the signal is no longer preset. When the signal “drops out”, the radio will remain on the channel for 3 seconds before Scan resumes.

Long press [side button 2] to begin scanning, a “scan on” voice sounds and LED indicator flashes green. Scan starts from the current channel and ascends up the channel numbers. Once activity is detected on a channel, scanning will pause on the active channel for you to receive, and you can press PTT key to call back after receive ended within 3 seconds.

Long press [side button 2] again to stop scanning, a “scan off” voice sounds and LED indicator not flashes green.

Monitor

Long press [side button 1] to enable monitor feature. Monitoring feature allows you to switch channel to monitor designated channel to receive weak signals. Release the key to disable it.

Tx Power

Users can choose the TX power level between high level and low level via the programming software.

Bandwidth

There are two types of bandwidths available. You can choose bandwidth as Wide (25 KHz) or Narrow (12.5 kHz) via programming software.

Note: In order to guarantee the stability of communication, the receiver bandwidth of radio should set the same as the transmitter.

CTCSS/CDCSS

You can set unique CTCSS/CDCSS to guarantee the quality of your communication. If CTCSS/CDCSS has been set on the current channel, CTCSS/CDCSS match from the transmitting radio is required for the radio to receive an incoming signaling. When current channel is set as CTCSS/CDCSS, on the programming software you can select subtone signaling as normal mode or special mode. The receiver and transmitter must be set the same signaling mode and CTCSS/CDCSS value, otherwise the communication will be effective.

Note:

●If there are no special requirements, it is recommended to use normal signaling mode directly.

●The radio supports non-standard code, and you can input non-standard code as you need.

CTCSS Standard Frequency Table

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

CDCSS Standard Code Table

No	Positive Code	Negative Code	No	Positive Code	Negative Code	No	Positive Code	Negative Code
1	D023N	D023I	29	D174N	D174I	57	D445N	D445I
2	D025N	D025I	30	D205N	D205I	58	D464N	D464I
3	D026N	D026I	31	D223N	D223I	59	D465N	D465I
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	D731I
24	D155N	D155I	52	D412N	D412I	80	D732N	D732I
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	UHF: 400-480MHz
Channel Capacity	16
Channel Spacing	25 KHz /12.5 KHz
Operating Temperature Range	-20℃～+60℃
Antenna Impedance	50Ω
Operating Voltage	DC 3.7V (±20%)
Battery Capacity	4000mAh
Frequency Stability	≤±2.5 ppm
Dimensions	59（L）*36（W）*115（H）mm
Weight	252g（Including Battery）
Transmitter	
RF Output Power	≤5W
Modulation	11KφF3E/16KφF3E
Max Frequency Shift	≤±2.5KHz /±5.0KHz
Audio Distortion	＜5%
Adjacent Channel Power	60dB
Receiver	
Sensitivity	≤-123dBm（12dB SINAD）
Adjacent Channel Selectivity	≥60dB(Wide)/ 55dB (Narrow)
Inter-Modulation	≥60dB(Wide)/ 55dB (Narrow)
Spurious Response Rejection	≥60dB(Wide)/ 55dB (Narrow)
Audio Power Output	0.5W
Audio Distortion	≤5%

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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