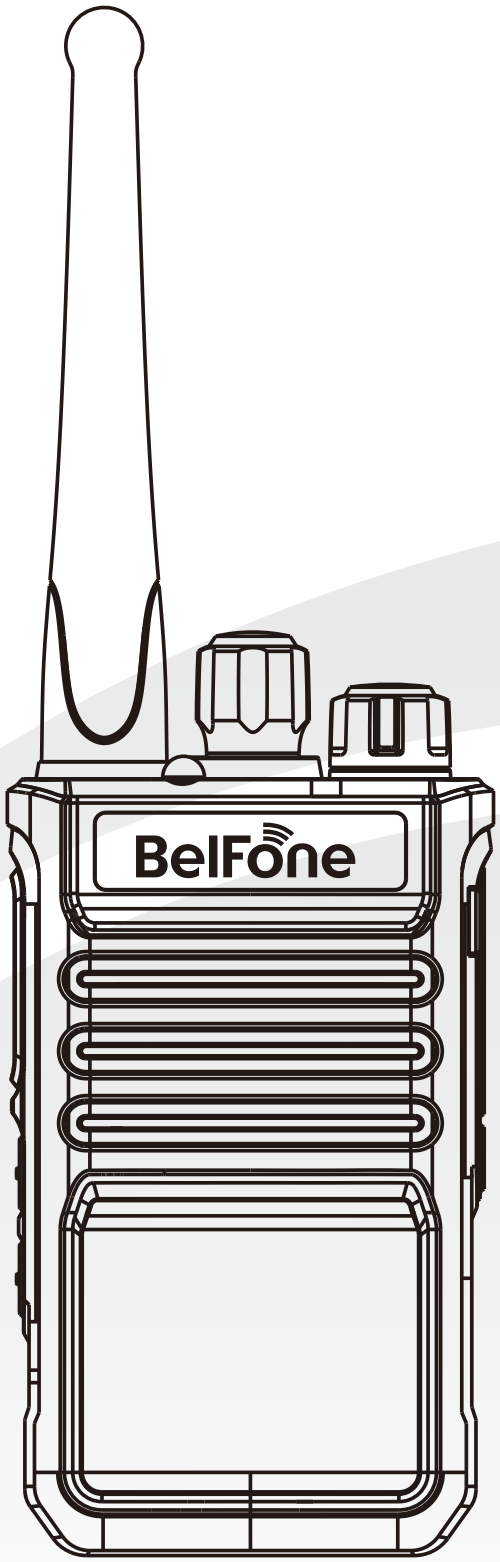
BelFone

www.belfone.com



BF-AP Series

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.

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

BF-AP 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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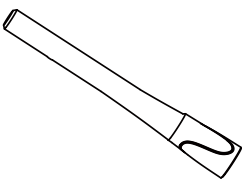
Unpacking and Device Inspection

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

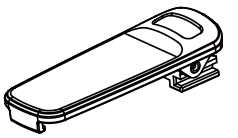
After carefully unpacking the radio, identify the items listed in the table below. If any items are missing or have been damaged during shipment please contact dealer or BelFone immediately.

Accessories

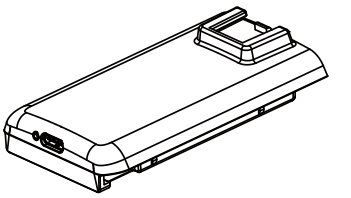
Items	Quantity
Antenna	1
Li-ion battery	1
AC adapter	1
Charging cable	1
Belt clip	1
Strap	1
User manual	1
Warranty card	1
Certificate	1



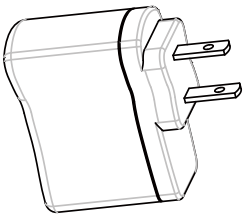
Antenna



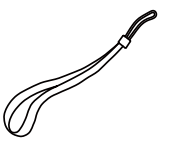
Belt clip



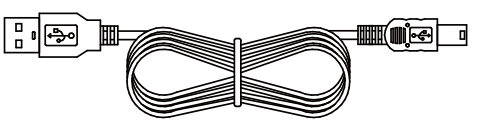
Li-ion battery



AC adapter



Strap



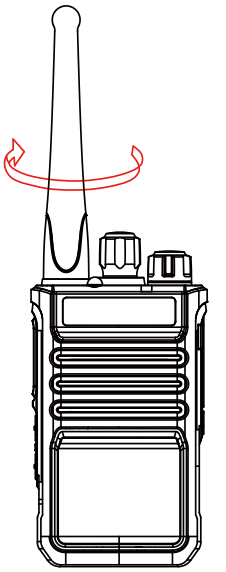
Charging cable

Installation of Accessories

Install/ Remove the Antenna

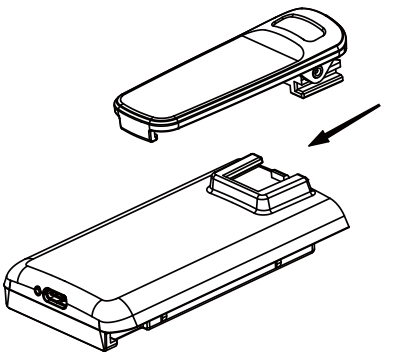
Hold the bottom of the antenna and screw it clockwise into the interface on the top of the radio until it is tightened.

Turn the antenna anti-clockwise to remove it.



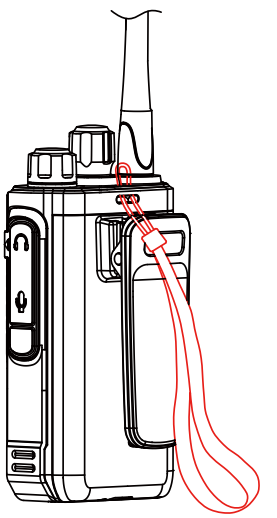
Install/ Remove the Belt Clip

Install along the belt clamp slot and hear a "click" sound to lock the belt clamp slot.



Install Strap

Thread the strap into the loop at the top of the back of the radio.

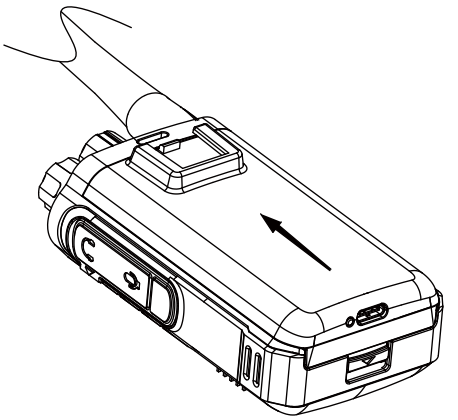


Install/Remove the Battery

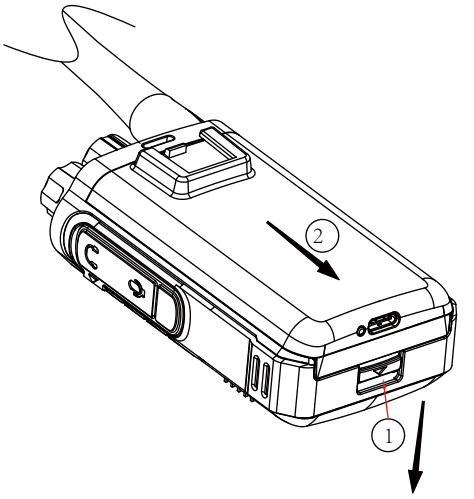
Warning!

- 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.

Align the battery with the corresponding grooves on the back of the radio, and then push the battery in parallel until a "click" is heard to lock it in place.



To remove the battery, first turn off the radio, then press down the latch on the bottom of the back of the radio, at the same time push down the battery and then take out the battery.



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

Battery Information

The new battery not being fully charged before shipment, please charge the new battery before use. Generally, the battery needs to be charged for 5 hours when it is used for the first time. The first three full charge and discharge cycles will optimize the battery capacity. When the battery power is low, it needs to be charged or replaced.

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℃—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 cutting off the power supply or removing 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

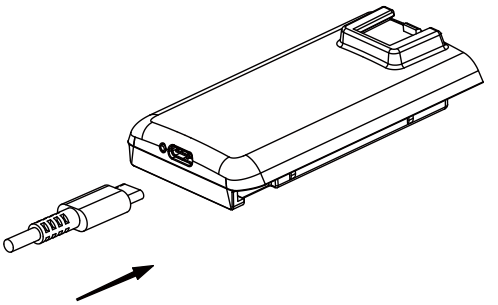
1.The battery performance will be decreased under 0℃. Please prepare a spare battery in cold weather. A battery not work properly in a cold environment does not mean that it is damaged. Please keep the battery and reconfirm at room temperature.
2.The dust on the battery contact point may cause battery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

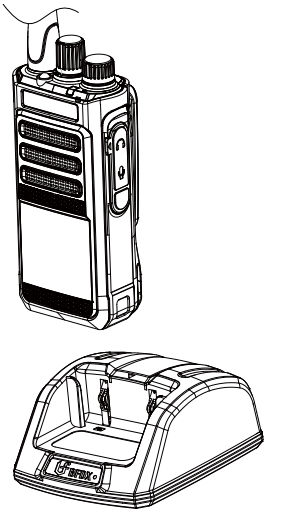
Battery Storage

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

The charger only specified by BelFone is allowed to use. The charge indicator on the battery indicates the charging progress.





Charge Steps:

1.Plug the AC adapter into the AC power output.

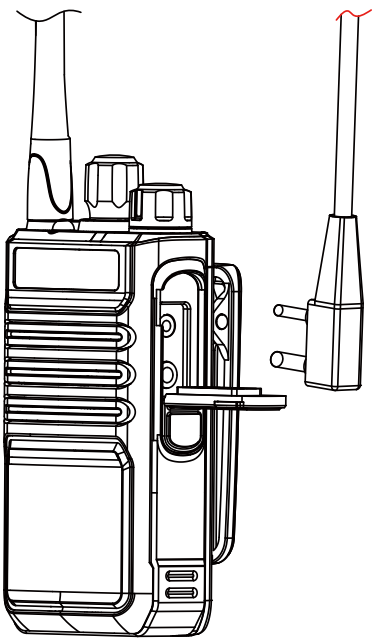
2.Insert the Micro USB interface into radio. The indicator light on the back of the radio lights red, indicating that charging is started;

3.When using a charging dock, insert the battery or the radio with the battery into the charger, confirm that the battery is in good contact with the charging terminal, the indicator light on the charger lights s red, indicating that charging is started;

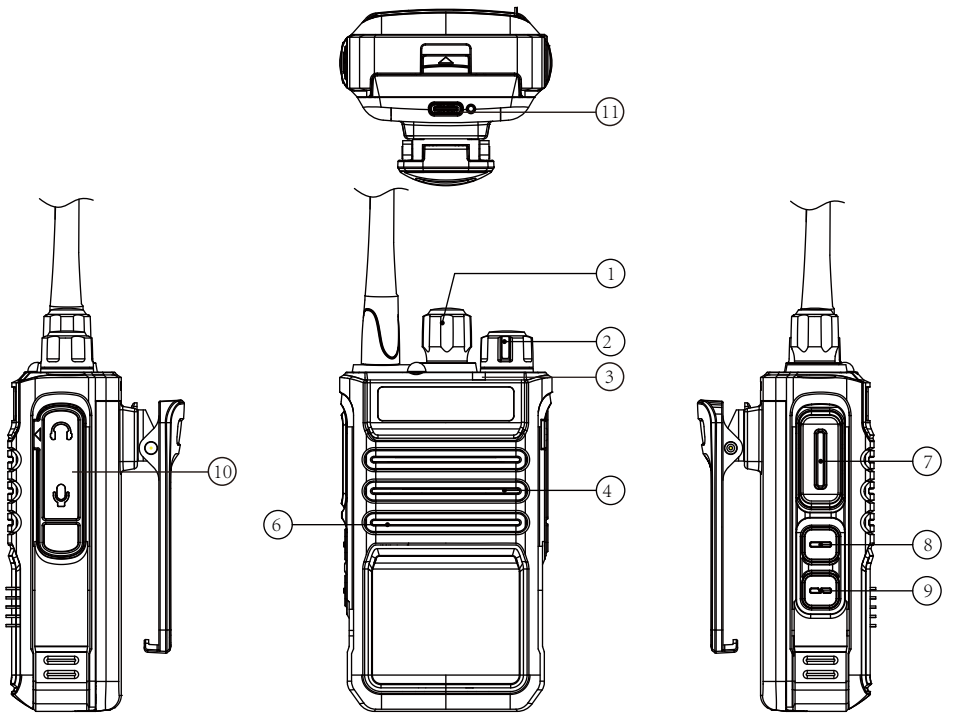
4.The indicator light turns green, indicating that the charging is completed.

Attach the Speaker/Microphone

Open the headphone cover and insert the speaker/microphone headphones directly into the speaker/microphone jack.



Getting Acquainted



①**Channel knob**
Rotate to select channels 1-16.
②**Power switch/volume adjust keys**
Rotate clockwise to power on, after the radio is powered on, rotate clockwise to increased volume, anti-clockwise to decrease the volume. Rotate anti-clockwise fully to power off.
③**LED Indicator**
When transmitting the LED will glow red, when receiving the LED will glow green.
④**Speaker**
⑤**Lamp**
⑥**MIC**
⑦**PTT key**
Press to speak into the microphone for transmission.
⑧**MONI(Monitor)Key**
Press and hold the key to monitor the selected channel.
⑨**SCAN Key**
Short press the key to turn on the lamp, and long press the key to enable/disable the scanning function.
⑩**MIC-SP-USB Jack**
Connect to optional speaker/MIC and USB programming cable.
⑪**USB Type-C Interface**
Connect the charging cable for charging.
Note: The pictures in this user manual are for reference only, and the actual model shall prevail.

Basic Operation

Power on /off

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

Adjusting Volume

In the powered-on state, 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: Users can hold down the MONI button for background noise and adjust the appropriate volume according to the background noise.

Select a Channel

Rotate the channel knob to select the desired channel 1-16. Rotate clockwise to increase the channel number, or rotate the knob anti-clockwise to decrease the channel number, and the current channel number will sound.

Note: All channels programmed on the programming software are need to set the channel frequency in advance. In the empty frequency channel, a voice will prompt: empty channel.

Transmitting

Hold down the PTT key to initiate the call. When calling, speak into the microphone in a normal tone, keep a distance of 3~4cm from the microphone, so that the radio can obtain the best sound quality. The LED indicator lights red, indicating that transmission is in progress.
Release the PTT key, and the radio will exit the transmission state and enter the receiving state.

Receiving

When the radio receives the signal, the LED indicator will light green.

●If the signal of the call is weak and the radio is set to a higher squelch level, the call will not be received.

●If the radio has set CTCSS/CDCSS signaling, it can only receive calls from radios with the same CTCSS/CDCSS signaling.

Functions and Operations

Scan

Scan is used to monitor the signals of channels on which the "Add Scan" option is set to "On".

To begin scanning:long press the SCAN key, there will be a voice prompt: scanning on, and the indicator light will flash green.

Scanning starts from the current channel and increases sequentially cycling through all channels. If a signal is scanned, the radio will remain on that channel and resume 5 seconds after the signal disappears, unless a new signal is detected within the delay time. Press the PTT key during the scanning process, the radio will pause scanning and return to the channel where the last signal was received for transmission. If no valid signal is received during the scanning period, pressing the PTT key to return to the channel where the scanning started for transmission.

To stop scanning:long press the SCAN key, the indicator light will no longer flash green, and the radio will return to the channel where it was before scanning. Press the MONI key or rotate the channel knob will automatically turn off scanning.

Monitor

Press and hold the MONI key to monitor weak signals that are difficult to hear during normal operation, or monitor background noise for adjusting the volume level when there is no signal in the channel.

Bandwidth

The radio supports setting the channel interval to broadband (25kHz) or narrowband (12.5kHz).

Note: The bandwidth of the transmitting and receiving channels should be set the same, otherwise the call quality will be affected.

Busy Channel Locking (BCL)

The busy channel locking function is to prevent interference caused by other users transmitting on the current channel. When "None" is set, regardless of channel conditions, pressing PTT can directly transmit. When "carrier" is set, if the current channel is active, pressing the PTT key will result in a warning tone and prohibit transmission. When "CTCSS/CDCSS" is set, if the channel receives a signal with the same CTCSS/CDCSS, pressing the PTT key will result in a warning tone and prohibit transmission.

Frequency Matching

Simultaneously press the MONI and SCAN keys, the LED indicator light will flash red and there will be a voice prompt "RFID", and the radio will enter frequency matching mode. At this point, the other party maintains the transmitting state until the LED indicator light of the radio turns green and there is a voice prompt "success", indicating successful frequency matching. When the red light of the radio turns off automatically and there is a voice prompt "Failure", it means that the frequency matching fails, and the radio will return to the normal working state. Press the key again to enter the frequency matching function.

Language

When rotating the channel knob, there will be a voice prompt the current channel number, and Chinese or English voice prompts can be selected through the programming software.

Squelch Level

The squelch level is used to adjust the noise threshold of the received signal. The higher the squelch level, the stronger the noise suppression is enabled. When the selected squelch level is too high, weaker signals cannot be heard. When the selected squelch level is too low, the signal will appear in the background noise.

Time-Out-Time (TOT)

The TOT function can prevent the current channel from being occupied by a single user for too long. For busy channels, a shorter time-out-time limit can be set. If the continuous transmission time exceeds the set value, an alarm will sound and transmission will end automatically.

VOX

The VOX function allows users to transmit without pressing the PTT key. When this function is activated, the transmission operation can be directly initiated through voice, and once the voice stops, the transmission will automatically end. When the environment is noisy, the VOX level can be adjusted to a higher level. When the environment is quiet, the VOX level can be appropriately lowered. When the VOX switch is set to "with headphones on ", headphones need to be plugged in to initiate transmission through voice. When the voice control switch is set to "Open without headphones", it can directly speak into the microphone of the handheld terminal to initiate transmission.

Note: AP5 and AP8 series only support VOX without headphones.

Battery Saver

The radio will automatically enter the power saving mode when it has no any operation for a period of time, which can extend the battery life.

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.

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.

Note: The noise reduction function is only supported in the "D" version.

CTCSS/CDCSS

The radio supports CTCSS/CDCSS to guarantee the privacy of the communication. When the CTCSS/CDCSS is set on the channel, voice output is only allowed when the CTCSS/CDCSS transmitted and received match. When the channel is set with CDCSS, the digital sub tone mode can be set as normal signaling or special signaling through the programming software. In normal signaling mode, the encoding rules of digital sub audio adopt universal CTCSS/CDCSS standard rules, while in special signaling mode, the encoding rules adopt special rules. Once the special signaling mode is enabled, please ensure that both the transmitter and receiver enable the special signaling mode, otherwise interoperability cannot be achieved.

Note:

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

2. The radio support non-standard CTCSS/CDCSS, which can be manually input through the programming software, and non-standard CTCSS/CDCSS also support special signaling modes.

CTCSS Standard Frequency Table

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

CDCSS Standard Code Table

CDCSS NO	Positive Code	Negative Code	CDCSS NO	Positive Code	Negative Code	CDCSS NO	Positive Code	Negative Code
1	D023N	D023I	29	D174N	D174I	57	D445N	D445I
2	D025N	D025I	30	D205N	D205I	58	D464N	D464N
3	D026N	D026I	31	D223N	D223I	59	D465N	D465N
4	D031N	D031I	32	D226N	D226I	60	D466N	D466I
5	D032N	D032I	33	D243N	D243I	61	D503N	D503I
6	D043N	D043I	34	D244N	D244I	62	D506N	D506I
7	D047N	D047I	35	D245N	D245I	63	D516N	D516I
8	D051N	D051I	36	D251N	D251I	64	D532N	D532I
9	D054N	D054I	37	D261N	D261I	65	D546N	D546I
10	D065N	D065I	38	D263N	D263I	66	D565N	D565I
11	D071N	D071I	39	D265N	D265I	67	D606N	D606I
12	D072N	D072I	40	D271N	D271I	68	D612N	D612I
13	D073N	D073I	41	D306N	D306I	69	D624N	D624I
14	D074N	D074I	42	D311N	D311I	70	D627N	D627I
15	D114N	D114I	43	D315N	D315I	71	D631N	D631I
16	D115N	D115I	44	D331N	D331I	72	D632N	D632I
17	D116N	D116I	45	D343N	D343I	73	D654N	D654I
18	D125N	D125I	46	D346N	D346I	74	D662N	D662I
19	D131N	D131I	47	D351N	D351I	75	D664N	D664I
20	D132N	D132I	48	D364N	D364I	76	D703N	D703I
21	D134N	D134I	49	D365N	D365I	77	D712N	D712I
22	D143N	D143I	50	D371N	D371I	78	D723N	D723I
23	D152N	D152I	51	D411N	D411I	79	D731N	D731N
24	D155N	D155I	52	D412N	D412I	80	D732N	D732N
25	D156N	D156I	53	D413N	D413I	81	D734N	D734I
26	D162N	D162I	54	D423N	D423I	82	D743N	D743I
27	D165N	D165I	55	D431N	D431I	83	D754N	D754I
28	D172N	D172I	56	D432N	D432I			

Specifications

General			
Model	BF-AP3016 BF-AP3018	BF-AP5016	BF-AP8016
Operating Voltage	DC3.7V (±20%)	DC 7.4V (±20%)	DC 7.4V (±20%)
Battery Capacity	1800mAh	1800mAh	2000mAh
RF Output Power	≤3W	≤5W	≤8W
Dimensions (L×W×H)	54* 30* 93mm	54* 33* 113mm	54* 35* 118mm
Weight	159g	214g	233g
Frequency Range	UHF: 400-480MHz		
Channel Capacity	16		
Channel Spacing	25 KHz /12.5 KHz		
Frequency Stability	≤±2.5 ppm		
Antenna Impedance	50Ω		
Transmitter			
4FSK Modulation	11KφF3E/16KφF3E		
FM Modulation	≤±2.5KHz /±5.0KHz		
Adjacent Channel Power	60dB		
Audio Distortion	< 5%		
Receiver			
Sensitivity	≤-122dBm（12dB SINAD）		
Intermodulation	≥60dB(Wide)/ 55dB (Narrow)		
Adjacent Channel Selectivity	≥60dB(Wide)/ 55dB (Narrow)		
Spurious Response Rejection	≥60dB(Wide)/ 55dB (Narrow)		
Rated Audio Output Power	0.5W		
Audio Distortion	≤5%		
Environmental			
Operating Temperature	-20℃～+60℃		
Storage Temperature	-30℃～+70℃		

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