blackbox

blackbox®

SEAL
2-WAY RADIOS

User Manual

Hello

We appreciate your using of SEAL two-way radio. We believe that the quality and function of this radio will bring you stable performance and smooth communication.

SEAL is a high-end professional two-way radio launched by SEAL; it is the best choice of working in public safety, railway transportation, forestry fire prevention or many other environments.

SEAL is waterproof and dustproof and its certification ensures you smooth communication under any tough circumstances. It also can effectively ensure your communication privacy and personal safety with multi-functions as Voice Prompts, Reverse Frequency, Talk around, PTT ID Encode as well as VOX and so on.

Please read this manual before use.
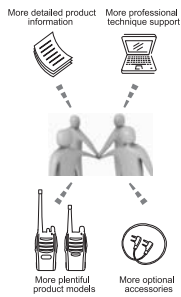

Welcome to use

blackbox™ two-way radio

- Superior Stability
- Waterproof & Dustproof IP67
- 5 types of Signaling
- Vibration Prompt
- 1600mAh Li-battery
- 40mm-diameter Speaker
- 9-class Noise-canceling Technology

- VOX
- 25/12.5 KHz Switchable
- 3 programmable keys
- Voice Prompt
- PC Programming
- Wired Clone

blackbox on-line Service Center

SEAL service network provides more information about on-line service of SEAL two-way radio.

More detailed product information
To deepen your understanding of the functions of this radio.

More plentiful product models
To display more plentiful product models, so that you can understand the details of these products in advance and make decisions correctly according to the requirement of work.

For more details, please visit: www.balckbox.com

More detailed product information   More professional technique support

More plentiful product models   More optional accessories

More professional technique support

• User manual and brochures
To provide download or on-line reading of the latest user manuals and brochures in covering detailed information of two-way radios.

• Software download
To provide downloading of the latest programming software from HQT website. Your two-way radio can be connected to the computer with programming cable to manage or edit the parameters of channel frequency and other items.

• On-line learning
To offer guidelines for detailed setting of the two-way radio.

More optional accessories
To provide various kinds of accessories, which can offer more comfortable operation and more remarkable performance of the radio to you.

• FCC RF EXPOSURE COMPLIANCE REQUIREMENTS FOR OCCUPATIONAL USE ONLY
The Federal Communications Commission (FCC), with its action in General Docket 93-62, November 7, 1997, has adopted a safety standard for human exposure to Radio Frequency (RF) electromagnetic energy emitted by FCC regulated equipment. Proper operation of this radio will result in user exposure far below the Occupational Safety and Health Act (OSHA) and Federal Communications Commission limits.

• DO NOT transmit for more than 50% of total radio use time (50% duty cycle). Transmitting more than 50% of the time can cause FCC RF exposure compliance requirements to be exceeded.

• This radio is NOT approved for use by the general population in an uncontrolled environment. This radio is restricted to occupational use, work related operations only where radio operator must have the knowledge to control the user's exposure conditions for satisfying the higher exposure limit allowed for occupational use.

• When transmitting, hold the radio in a vertical position with its microphone 1 inch (2.5cm) away from your mouth.

• The radio is transmitting when the red LED on the front of the radio is illuminated. You can cause the radio to transmit by pressing the PTT bar on the radio.

• These are required operating configurations for meeting FCC RF exposure compliance. Failure to observe these restrictions mean violation.

Caution

Any Changes or modifications not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Statement

SEAL endeavors to achieve the accuracy and completeness of this manual. As for any inaccuracies and omissions that may possibly occur, the right to interpretation is reserved to SEAL.

It is prohibited to copy, transmit, excerpt and store in any retrieval system, or translated to any languages without written authorization of SEAL.

Contents

Safety Matters

Please read these rules below. Nonobservance of the rules may cause danger or violation of law.

- The use of this radio must be in compliance with the regulations of the local government.

- Turn off the radio before you enter places of flammable or explosive environment.

- Do not replace or charge battery pack in places of flammable or explosive environment.

- Turn off the radio before you approach blast area and detonator area.

- Do not use the damaged antenna which may cause slight burn on the skin.

- Only qualified technician are allowed to maintain this two-way radio. Do not disassemble the radio by yourself.

- To avoid problems caused by electromagnetic interference or electromagnetic compatibility, please turn off the radio in places with "Raido Transmiting Equipment Prohibited" mark, such as hospitals or other health care places. When taking a plane, turn off the radio if required.

- In a car with air bag, do not place the radio within possibly involved area when the air bag expands.

- Do not expose the radio to direct sunlight or near heating devices for a long time.

- Keep the radio vertical and speak near the microphone during transmitting.

- Make sure that the antenna is 2.5 cm away from the body during transmitting if you carry the radio on your body.

Product Inspection

Thanks for using SEAL two-way radio. Before use, we recommend that:
First check the package for any signs of damage;
Carefully open the package and identify the items listed below;
If any items are missing or damaged during shipment, please contact your dealer.

Items

| Radio SEAL Qty: 1 | Antenna Qty: 1 | Li-poly Battery Qty: 1 | Charger Qty: 1 | Adapter Qty: 1 |
| Strap Qty: 1 | Belt Clip Qty: 1 | User Manual Qty: 1 | | |

Note: Frequency is marked on the color circle at the bottom of the antenna.

Get Acquainted
Battery Information

Applicable battery Model
Please charge with HQT approved battery; using other batteries may burst and cause personal damage.
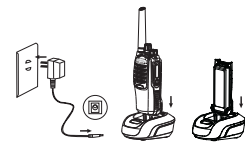
Note:
1. Do not short-circuit the battery terminals or dispose the battery in fire. Never attempt to disassemble the battery pack.
2. Charge the battery in -0° ~45° temperature. Otherwise the battery may not be fully charged.
3. Turn off the radio equipped with battery before charge. Using the radio while charging may interfere with charging.
4. Do not pull/plug the adapter and the battery during charging to avoid interfering with the charging procedure.
5. When the battery power consumes quickly even if it is fully and correctly charged, that means the battery life is over and please replace with new battery.
6. Do not charge if the battery or radio is wet. Before charge you should dry it with cloth to avoid danger.

⚠ Warning:
Conductive metals such as jewelry, key or decorating lace may result in short circuit and a large quantity of heat when coming to contact with battery electrodes. Treat any battery carefully especially when placing it into pocket, wallet or other metal container.

Charging Operation
Please charge as follows:

1. Turn off the radio. Plug the DC connector of the adapter into the DC jack on the rear of the charger.
2. Plug the AC connector of the adapter into an AC outlet.
3. After the charger is electrified, the LED glows red for 1 second and goes out, which means the charger is ready for normal battery charging. If the LED flashes red, it means the charger is not ready for battery charging.
4. Insert the battery or radio equipped with battery into the charger. Make sure the battery is in good connection with charger electrode.
5. LED glows red during normal charging and flashes red during trickle charging because of very low battery power. And after the battery power reaches a certain mount during trickle charge, the charger will automatically turn to normal charge mode.
6. The battery is fully charged when LED glows green. The charger will stop charging automatically.

Cautions in Charging
1. The battery is not charged in factory. Please charge the battery before initial use or after long-time storage.
2. Repeat charging 2 or 3 times and the battery will reach its best capacity. Please replace or charge the battery if the battery power is low.
3. When the battery power consumes quickly afternormal charge, the battery life is finished. Please contact your dealer and buy new SEAL approved battery.
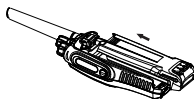
Antenna Information
- The stubby antenna is suitable for short-distance communication; the thin and long antenna will provide the best communication effect. Also it is comfortable to carry on the waist.
- The communication range may be shortened in rainy days or in forest. Please make preparations for that.

Attaching and Removing
Attaching and Removing the Battery

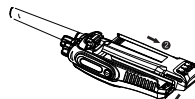**Attaching the Battery (Figure 1)**
Match the sockets of the battery with the leading rail of the backside of the radio. Make sure the battery is well-connected to the radio horizontally.

Removing the Battery (Figure 2)
Before removing, make sure that the radio is turned off. Then unlock the battery lock by pressing the bottom following step1 as showed in the picture. Slide the battery away from the radio following step 2 in the picture.
Notice: Please take off the belt clip before removing the battery.

(Figure 1)

(Figure 2)

Attaching/Removing the Antenna

Attaching the Antenna: (Figure 3)
1. Insert the antenna into the connector on the top of radio by holding the antenna at its base.
2. Rotate the antenna clockwise to fasten it.

Removing the Antenna: (Figure 4)
Rotate the antenna counter clockwise until you can remove it.
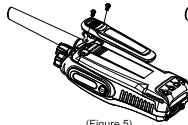

(Figure 3)

(Figure 4)

Attaching/Removing the Belt Clip
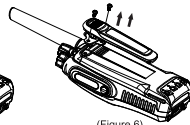
Attaching the Belt Clip: (Figure 5)

Match the holes of the belt clip with the holes of the backside of the radio. Then fix them by using the two 2.5*4.5 screws.

Removing Belt Clip: (Figure 6)

Remove belt clip by removing the screws.

(Figure 5)   (Figure 6)

Attaching External Earphone/Microphone

Attaching External Earphone/Microphone

1. Unclose the cover of earphone/microphone jack. (No need to remove it.). (Figure 7)
2. Insert the earphone/microphone into the earphone/microphone jack. (Figure 8)

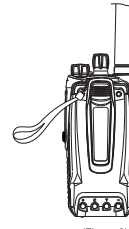☞ Note:The radio is not fully waterproof while using external earphone/microphone.
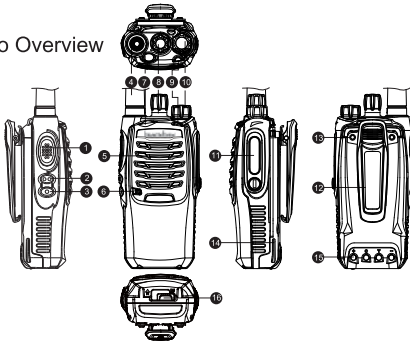
(Figure 7)   (Figure 8)

Attaching Hand Strap

Thread the strap into the hole at the back of the radio and fasten it.

(Figure 9)

Radio Overview

❶ PTT Key
To transmit, press down [PTT] key and speak into the Mic; release it to receive.

❷ Programmable Key 1 (SK1 Key)
PC programming the function and set up related function by this key.

❸ Programmable Key 2 (SK2 Key)
PC programming the function and set up related function by this key.

❹ Attenna

❺ Speaker

❻ Mic

❼ Programmable Key (TK Key)
The press mode and its function can be programmed by PC software.

❽ Flashlight

❾ LED
LED flashesred while transmitting and flashes green while receiving.

❿ Plastic Cover of Double-axis Switch

⓫ Volume Knob
Rotate the knob to adjust the volume.

⓬ Channel Selector

⓭ Mic/earphone Cover

⓮ Belt Clip

⓯ Screws (Belt Clip)

⓰ Li-poly Battery

⓱ Charging Pieces

⓲ Battery Latch

Basic Operation

Turning on/off the Radio

Rotate the Power Switch/Volume Control knob clockwise until a lick?sounds to turn on the radio and you will hear channel annunciation.

Rotate the Power Switch/Volume Control knob clockwise until a lick?sounds to turn off the radio.

Adjusting Volume

You can adjust volume by rotating it after the radio is turn on.

Tip:You can listen to the background noise by pressing programmed "Squelch Off " key and adjust the volume via rotating Power Switch/Volume Control knob..

Selecting Channel

Rotate the channel knob to select operating channel from 1~16, according to the numbers and symbols on the bottom of channel selector knob or channel annunciation. Also can base on the voice prompt to select.

Making Call

To make a call, hold down [PTT] key and speak into the microphone with normal voice. Please keep the microphone 2.5cm-10cm away from your mouth.

Tip:

1. Hold down [PTT] key and LED glows red, the radio begins to transmit.

2. If the battery power is insufficient, the radio can not transmit when battery power is not enough for normal operation.

Receiving Call

Release [PTT] key to receive a call.

Low Battery Alert

If LED flashes red, it indicates the battery power is insufficient. The voice prompt also will notice the low battery notice.

Programmable Key

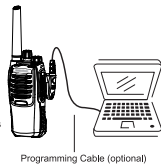The programmable keys can be programmed as functions below by PC software.

Function	Deacription
None	The programmable key is invalid.
Calling1/Calling2	Send the relevant Code of Selective Signaling (DTMF/2-TONE/5-TONE/QDC1200)
Alarm	Press the key and Alarm is turned on. Press the key again to cancel it.
Working Alone	Protecting the safety of the user when works alone. The radio will sound after a certain time (the time can be set up by PC programming software) when it is under the Working Alone mode, then you have to press the key or the radio will be at the state of automatically alarming.
Monitor	Press the key to turn on the singling squelch; Press the key again to return to the primary squelch mode.
Monitor Momentary	Press the key to turn on the singling squelch; Release the key to return to the primary squelch mode.
Squelch Off	Press the key to turn on the noise squelch; Press the key again to return to the primary squelch mode.
Squelch Off Momentary	Press the key to turn on the noise squelch; Release the key to return to the primary squelch mode.

Scan	Press the preprogrammed Scan key. Scan starting from the current channel and ascends through the channel numbers in scan list. The LED flashes green in scan mode and glows green when a signal is received on a channel and the signaling matches. Press the key again to exit.
Talkaround	Turn Talk Around ON and OFF by pressing the programmed key.The radio will transmit on the RX frequency when Talk Around is on, and the CTCSS/CDCSS encode is the same with CTCSS/CDCSS decode. You may occasionally experience an interruption in service (due to power failure, etc.). Talk Around allows you to communicate directly with other transceivers, without the use of a repeater.
VOX	Press the preprogrammed VOX key to activate the VOX function. You can transmit without holding down [PTT]. Press this key again to exit.
Battery Power Inquiry	The radio could prompt the current battery power.
Vibration	Vibration prompts calling.
Noise Immunization	Noise Immunization reduces the environment noise to make sure the other side could hear more clearly.

Advanced Operation

PC Programming

1. Log in SEAL on-line service center and download programming software. (or contact your dealer for programming.)

2. Turn off the radio and connect it to PC with programming cable. (see figure on the right)

3. Run the software and turn on the radio. Press "━▣" button and write parameter data to the radio.(see figure below)

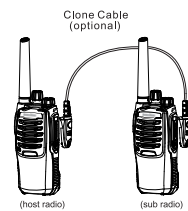4. For the setting of parameters, please refer to the help documents of the software.

Programming Cable (optional)

Wired Clone

1. Connect host radio and sub radio with clone cable.

2. Hold down [SK2] key on host radio, then turn on the host radio. The indicator flashes red twice, which means the host radio is ready for cloning. Turn on sub radio as usual.

3. Press [PTT] key on host radio, clone function of sub radio is turned on if LED flashes green twice. Press [PTT] key on host radio again, clone function of sub radio is turned off if LED flashes red twice. Skip Step 3 is to forbid the clone function of sub radio.

4. Press [SK2] key to clone. The LED on the host radio flashes red and the LED on the sub radio flashes green. LED on sub radio goes out when the cloning is finished. If LED on host radio glows green, the clone is failed.

5. Replace with other "sub radio", and repeat step2~6 to continue cloning.

Tip: PC programming can prohibit the clone function of host radio.

Clone Cable (optional)

(host radio)   (sub radio)

Signaling

The radio supports CTCSS/CDCSS/2-Tone/5-Tone/QDC1200. You can set the parameters by PC programming or contact your local delaer.

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Optional Accessories

Optional accessories are available according to your requirements. All SEAL accessories with good quality will ensure you clear communication and outstanding performance.

Earphone (Air Tube):EAN01   Clone Cable: CC02   Programming Cable: PR03

Remote Speaker: HN01

Care and Maintenance

Question and Answer

Problem	Solution
No power(unable to turn on)	• The battery power may be insufficient. Please charge or change the battery.
The battery power consumes quickly after charge.	• The battery life is finished. Please change for new battery.
Communication with other members can not be carried out.	• Please check if your frequency and CTCSS/CDCSS are the same with other members in your group. • Maybe you are too far away from other members. Please check if you are within communication range.
Voices of non-group members are heard on the channel.	• Please change CTCSS/CDCSS, and change those of your members, too.
There is no sound during transmiting or quite low sound received by the partner.	• Please check if the volume is turned to its highest level. • Ask your local dealer to check if the MIC is in good condition.
The noise is always heard on the channel.	• You may be too far away from other members and can not receive. Please get close to your members and try again.

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Maintenance

Your radio is a product with excellent design and technology, please treat it with care.These recommendations can help you effectively use the radio.

- Keep the radio dry. Rain, moisture or other liquid may cause damage to the radio.
- Do not throw, hit or vibrate the radio. Brutal treatment may damage the inner IC or other elements.
- Do not hold the radio by the antenna or external MIC.
- Please use the original or standard antenna. Unapproved antenna or modifications of accessories may cause damage to the radio.

- Use lint-free cloth to clean the dust or stains on the radio.
- Cover the earphone/microphone pad when not using the radio.
- Use mild detergent (not corrosive chemicals) and cloth to clear the casing, control knob and keyboard after long-time use.

Note:
All recommendations above also refer to your battery, charger and accessories. If any of them works abnormally, please send it to nearest service center.

Service Commitment

1. SEAL two-way radio body has an 18-month guarantee; accessories (battery, charge adapter, charger and antenna) 6 months; earphone 3 months.
2. Replacement is available subject to the presentation of fully-filled warranty card or original purchasing invoice in case that the radio cannot work normally due to non-personal cause within the guarantee.
3. Replacement and repair is available subject to the presentation of fully-filled warranty card or original purchasing invoice in case that the radio or accessories cannot work normally within 30 days from the purchase date.
4. The repaired part has its own guaranty or 90-day guaranty from the repair date. The longer one is valid.

Warranty

1. The guaranty is only valid under normal use. And guaranty is unavailable under such conditions: dissembling or modifications, damages caused by outside force, water let-in, fire burning, and usage of unapproved accessories or antenna, not according to the instruction manual and so on.
2. The guaranty is in effect from the purchase date on the invoice.
3. Free repair is unavailable if the SEAL mark or Serial Number mark is torn off.
4. Only the fully-filled warranty card and original purchasing invoice with SEAL's seal or dealer's seal affixed is valid for identifying the guarantee.

Cautions

1. Read the user manual before use.
2. Do not use the radio with damaged antenna. Use the radio only with standard antenna.
3. Turn off the radio in potential dangerous environment.
4. Avoid the contact between the battery and the metal, oily or corrosive objects.
5. Do not dip the radio or battery into water or throw them in fire.
6. Use the radio only with standard battery, adapter, charger and earphone.

Terms of Warranty

1. SEAL two-way radio body has an 18-month guarantee; accessories (battery, adapter, charger and antenna) 6 months; earphone 3 months.
2. Only the fully-filled warranty card or original purchasing invoice with SEAL seal or dealer seal affixed is valid for identifying the guarantee. (The invoice should give clear indication of accessories, radio, serial-number, purchasing date, purchasing price and other items.)
3. If the radio body went wrong within the guarantee, it should be ensured to work normally over 30 days after the repair.
4. Replacement and repair is available subject to the presentation of fully-filled warranty card or original purchasing invoice in case that the radio cannot work normally as the instruction says within 30 days from the purchase date. (Note that there must not be visible abrasion on radio body and accessories.)
5. Replacement of the same model is available subject to the presentation of 3-time repair receipt in case that the radio body still work abnormally after three-time-or-above repairs within the guarantee.
6. Repair of accessories (battery, adapter, charger and antenna) is available to the presentation of both fully-filled warranty card and original purchasing invoice.
7. The cost of materials and repair are covered during the time of guarantee.

8. Guarantee is unavailable in case that the SEAL mark or the serial-number mark is torn off.
9. Guarantee is unavailable in cases below:
1) Beyond the warranty period;
2) Defects or damages under abnormal use;
3) Defects or damages because of misoperation, accident, water penetration and carelessness;
4) Defects or damages because of incorrect testing, operation, repair, installation, reconfiguration or adjustment;
5) Defects or damages to antenna because of non-material or non-processing problems;
6) Defects or damages because of unauthorized repair and disassembling;
7) Product that the serial-number mark is torn off or unable to identify;
8) Product with unclear purchasing date;
9) Battery under such conditions:
a. Any damages or unsealing to the battery pack;
b. Defects or damages to battery because of charging with improper equipment or use beyond regulated maintain condition;
10) Abrasion under normal use.

Note:The warranty ordinance, which is in accord with Chinese warranty regulations, will be modified properly according to marketing. If modified, the warranty ordinance is subject to our latest updating notice issued by SEAL service center.

Appendix

Appendix 1: Specification

Item	SEAL
Frequency Range	UHF: 400~470MHz
Channel Capacity	16(15+S)
Channel Spacing	12.5kHz
Frequency Stability	±2.5ppm
Operating Temperature	-35℃~ +60℃
Antenna Impedance	50Ω
Operating Voltage	7.4V

Item	SEAL
RF Output Power	UHF:4W/1W
Audio Distortion	≤5%
Sensitivity	0.25uV
Max Audio Output Power	1.5W
Dimension (H×W×D)	118×55×34mm
Weight (with antenna & battery)	252g
Li-poly Battery	1600mAh

Appendix II: Technical Terms

Name	Description
Standby	The radio is in receiving mode when no key is operated.
CTCSS /CDCSS	CTCSS/CDCSS is a kind of signaling attached to audio signal. If CTCSS/CDCSS of the transmitter is the same as that of the receiver, the speaker is unmuted and the sound comes out. Otherwise the sound can not come out.
Battery Save	If there is no signal being received or no operation being conducted for some time, the radio will enter into power saving mode. In this mode, the radio will stop working at regular intervals to save power.
TOT	The time out timer is used to prevent someone from using the same channel for a long time and meanwhile avoid damage to the radio due to long-time transmission.
Squelch	This is to solve the problem of talk quality and noise. Squelch is to suppress the background noise and keep the radio quiet when no signal is received. It can mute the radio when no signal is received. Turn on the Squelch, and you will hear the sound from the speaker.

Squelch On	Under such condition, the radio is receiving all the audio signals (even if the signal is noise signal.)
Monitor	This function enables you to hear all the calls even with unmatched CTCSS/CDCSS.
Scan	A way to hear conversations on all channels.
BCL	When this channel is in use by other users, your radio is prohibited to transmit on the channel to avoid interference.
VOX	VOX enables user to speak into the radio without pressing [PTT] key and the sound is transmitted.
Wired Clone	This is a way to clone parameters from one radio to another one.
Revert Channel	Revert channel refers to the current working channel when pressing [PTT] key during scan.

Safety Information

Please read the following safety guidelines. Nonobservance of these guidelines may cause danger or violation of law.

⚠ Warning — Don't transmit with antenna detached from the radio or don't damage or change antenna type. Strong electronic waves are emitted from the radio and damages or changes to the antenna may effect the performance of the radio, and it may cause the radio to be defective and not covered under warranty.

⚠ Warning — Don't use other manufacturers' accessories. Unknown or unauthorized accessories may cause the radio to be defective and not covered under warranty.

⚠ Warning — Don't disassemble the radio. Disassembly of the radio may cause a serious defect or malfunction and not be covered under warranty.

⚠ Warning — Don't give an excessive shock to the radio.
Don't place the radio where the direct sunlight or high temperature occurs.
Don't make a damage to the battery pack by sharp substance or an excessive shock.

⚠ Warning — Turn off the radio before boarding on an airplane.
Don't use the radio in the hospital without any pre-approval.
Don't use the radio at the place of where computer of other electronic devices are being used.

⚠ Warning —
• Please keep the radio at least 1 inch away from the human body.
• Don't give any damage to antenna.
• When using earphone, please reduce the volume to a low level. If not, unexpected high sound may have harmful effect to your ear.
• Don't touch the conductive metal of the battery radio with wet hands. It may cause damage on your hands.
• Please be careful when putting the battery in a pocket or a bag.

Appendix 3: Frequency Chart (Used to record the frequency.)

Model:
Serial number:

Channel	Tx Frequency	Tx CTCSS/CDCSS	Rx Frequency	Rx CTCSS/CDCSS	Optional Signaling
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					