Two-way radio Shortcut Operations List

14	Whether monitor receiving signal under radio state	DW	On/Off	F+↓,↑↓ ,F	Off
15	Setting alien frequency value	OFFSET	00.000-69.975MHz(UHF) 00.000-37.995MHz(UHF)	F+F, input the value of alien frequency by keypad	
16	Unlock/lock numerical keypad	LOCK	keylock	Press and hold down F key for 2 seconds to unlock/lock digital keypad	Locked
17	Selecting high/low power	LOW	high/low	Press * key to switch high/low power	High power
18	time out timer			Set time out timer On or Off via radio programming software	180 seconds
19	Busy channel lockout			Set Disable or Enable via radio programming software	enabled
20	Setting backlight			1. OFF; 2 Always On; 3. On for five seconds. Setting via radio programming software.	On for 5 seconds
21	Backlight switch and monitor signal			Short press moni key, switch the backlight; Long press moni key, Cancel squelch instantaneously;	Cancel squelch instantaneously

Friendly note:
The above-mentioned shortcuts can be implemented under VFO mode, some function settings are not allowed under memory channel display mode and channel display mode.

Senior Operations of Two-way radio

1. Two-way radio display mode

The Two-way radio display modes can be classified into VFO/CH/MR modes. When the system stays under Two-way radio state, you may press # key to cyclically switch proper display modes to select the desired one.
1).VFO - Variable frequency display mode (See Fig. 7-1)
2) CH - channel display mode (See Fig. 7-2)
3) MR - channel memory display mode (See Fig. 7-3)

Fig.7-1

Fig.7-2

Fig.7-3

2. Selecting channel/frequency

1) VFO (variable frequency display) mode:
a. Input the required frequency value with number keypad;
b. Press [▲]or[▼]key to increase or decrease the frequency by step value set by the system, and select the required frequency value.
2) CH (Channel display) and MR (Channel memory display) modes:
a. Input the required channel with number keypad;
b. Press [▲]or[▼]key to increase or decrease the channel value, and select the required channel.

3. Saving channel

1) Select frequency: press [#] key to switch into VFO mode and select the required frequency;
2) Select channel: press and hold down [#] key for 2 seconds and the frequency number flashes, press [▲]/ [▼] key to select the frequency to be saved (01-99 channels available);
3) Save channel: after selecting the proper channel, press [✱] key to save the receiving frequency which is the same as transmitting frequency. You may also perform the previous two steps to set a different transmitting frequency and press down [#] key to save it.

4. Deleting channel

1) Select the memory channel to be deleted;
2) Power off the Two-way radio;
3) Press and hold down the [#] key to power on the Two-way radio;
4) “CLR - number of memory channel to be deleted” will be displayed on the LCD screen (see Fig. 7-4). Press the [#] key and the LCD screen will display “DELETE”, all the selected memory channels will be deleted.

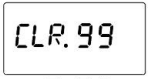


Fig.7-4

Senior Operations of Two-way radio

5. Initializing Channel

There are three deletion modes for the initialization of memory channel, including ALL RST (delete all Two-way radio memory channels and radio memory channels), MR RST (delete all Two-way radio memory channels) and FM RST (delete all radio memory channels).

1) Delete all Two-way radio memory channels and radio memory channels:

a. Power off the Two-way radio;
b. Press and hold down the [F] key to power on the Two-way radio;
c. Press the【▲】/【▼】 key to cyclically switch till the LCD screen displays "ALL RST" (see Fig. 7-5), press the 【F】key again and the LCD screen will display "WAIT". Once the Two-way radio goes back to VFO display mode, all the Two-way radio memory channels and radio memory channels will be completely deleted.

2) Delete all Two-way radio memory channels:

a. Power off the Two-way radio;
b. Press and hold down the 【F】key to power on the Two-way radio;
c. Press the【▲】/【▼】 key to cyclically switch till the LCD screen displays "MR RST" (see Fig. 7-6), press the 【F】key again and the LCD screen will display "WAIT". Once the Two-way radio goes back to VFO display mode, all the Two-way radio memory channels will be completely deleted.

3) Delete all radio memory channels

a. Power off the Two-way radio;
b. Press and hold down the 【F】key to power on the Two-way radio;
c. Press the【▲】/【▼】 key to cyclically switch till the LCD screen displays "FM RST" (see Fig. 7-7), press the 【F】key again and the LCD screen will display "WAIT". Once the Two-way radio goes back to VFO display mode, all the radio memory channels will be completely deleted.

Fig.7-5 Fig.7-6 Fig.7-7

Warning:
Once the memory channel is deleted, data cannot be restored and has to be saved again. Please be careful!

Friendly note:
Select ALL RST and all memory channel data will be deleted, and the Two-way radiofrequency will return to 400.000MHz.

6. Selecting and viewing sub-audio frequency

To set the sub-audio frequency, press the 【F】key under VFO mode and then Key 6 to enter into CTCSS or Key 7 to enter into CDCSS, press 【▲】or【▼】to select proper sub-audio frequency, then press the【F】key to save and exit. Such function can be set via radio programming software. To view the sub-audio frequency, press the 【F】key under MR mode and then Key 6 or 7 to view preset CTCSS or CDCSS.

Basic Radio Operations

1. Setting radio station

1) VFO (variable frequency display) mode:
Enter the required radio frequency with number keypad, press the 【▲】 or 【▼】 key to increase or decrease the frequency by step value preset by the system and select the required frequency value.

2) CH (Channel display) and MR (Channel memory display) modes:
a. Enter the required channel with number keypad;
b. Press the 【▲】 or 【▼】 key to increase or decrease the channel number and select the required channel.

2. Exiting radio state

Under radio state, press the 【F】 key and then 【#】 key to switch to Two-way radio working state.

3. Saving radio channel

1) Select radio frequency: press the 【#】 key to switch the display mode into VFO mode, and select the required frequency;

2) Select radio channel: press and hold down the 【#】 key for 2 seconds and the channel number flashes, then press the 【▲】 or 【▼】 key to select the channel(s) to be saved (01-30 channels available);

3) Save radio channel: select the required channel and press the 【*】 key to save the radio channel. chosen memory channels are deleted.

4. Deleting channel

1) Select the radio channel to be deleted;
2) Power off the Two-way radio;
3) Press and hold down the 【#】 key to power on the Two-way radio;
4) LCD screen displays “CLR-number of deleted memory channel”, press the 【#】 key and the LCD screen displays “DELETE”, then all the

Fig.8-1

5. Initializing memory channel

To learn about the initialization of radio memory channel, please see “Initializing Two-way radio memory channel”.

6. Setting squelch level

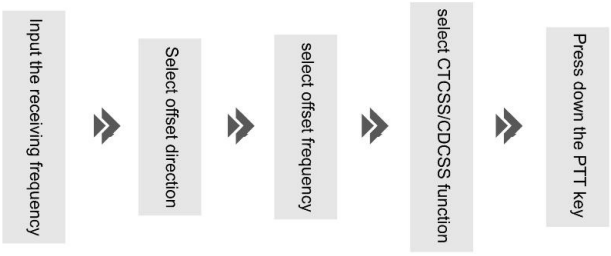
Under radio working state, press the 【F】 key and then 【1】, then press the 【▲】 【▼】 key to select a number from 0-9, finally press the 【F】 key to save and exit.

Friendly note:

the lower the squelch level is, easier to enable noise. The ex-factory setting is level 1.

Operations via Repeater

If positive/negative frequency offset mode (the same receiving frequency while different transmitting frequency) is used to implement switching via repeater, or for repeater with CTCSS/CDCSS encryption setting or with unspecific positive/negative frequency offset, the following setting process is applicable:



1. Select offset direction

Select to determine whether the transmitting frequency is higher (+) or lower (-) than the receiving frequency.

1) Select the required receiving frequency;

2) Press down the [F] key and then [5] key, Each time redo the operation, the offset direction changes as follows.

2. Select offset frequency

To learn this functional operation, please check the Shortcut Operations of Two-way radio List.

Troubleshooting

Problems	Solutions
Power failure	The battery unit may run out of power, please replace or recharge it. The battery unit may be installed improperly, please remove it and install again.
The battery lasts a short time even after being charged.	The service life of battery unit has expired. Please replace it. The battery is not fully charged. Please be sure to fully charge the battery and don't remove it till the indicator light turns green.
Failure to communicate with other team members	Be sure to use the same frequency as that of the others. To check whether you are too far away from the other members, please be sure to stay within the effective range of the other Two-way radios.
Other member's voice appears in the channel	Change CTCSS signaling and the signaling of all Two-way radios in the group Apply for changing the frequency point
Whole frequency band noise after programming	The squelch level is set too low during the programming (non-professionals are not advised to change functional parameters)
No sound after the earphone works for some time	Check whether the earphone jack is damaged. Please send it to local authorized distributor service center for repair.
Short communication distance and poor sensitivity	Check whether the antenna works properly or the antenna base is blocked or damaged Whether it is set at low power

Troubleshooting

Problems	Solutions
The Two-way radio can receive signals from the other party but fails to transmit.	Check the 『PTT』 key, and send it to local authorized distributor service center for repair.
Failure to power on or frequently power off	Check whether the battery contact is deformed or broken.
Soundless speaker	Check whether the volume potentiometer is tuned at minimum level (otherwise please send it to local authorized distributor service center for repair)
Too low or intermittent voice on the other party's Two-way radios	Check whether the eyelet at the MIC transmitter is blocked (otherwise please send it to local authorized distributor service center for repair)
Intermittently receiving , accompanied by loud noise	Beyond the communication range or blocked by high-rise building, or in basement, etc. (otherwise please send it to local authorized distributor service center for repair)
The sound of the speaker is lower or "cracking" after using for some period	To check whether the speaker mesh is damaged, or there is iron dust or other things on the membrane (please send it to local authorized distributor service center for repair)
There is startup sound heard but allows no operation.	The battery power is too low; please replace a battery with full power and retry.

Knowledge on Two-way radio Maintenance and Cleaning

- Handle gently, don't hold the antenna or external microphone to move the Two-way radio.
- Use lint-free cloth to wipe dust or stain off the Two-way radio in order to prevent poor contact.
- If the external earphone/microphone is not being used, please cover the earphone/microphone jack.
- Use neutral detergent (never use strong corrosive chemicals) and wet cloth to clean the keys, control knobs and casing after a long-time use.

Appendices

Appendix I Functional Operation List under VFO/MR/CH Display Mode

Function	VFO	MR	CH
Setting squelch level	√	√	√
Power saving function	√	√	√
Setting auto power-off time	√	√	√
On/Off key tone	√	√	√
Positive/negative alien frequency	√	×	×
CTCSS	√	×	×
CDCSS	√	×	×
Priority channel sweep	√	√	√
Voice-operated transmission function	√	√	√
Setting frequency step value	√	×	×
DTMF (ANI)	√	√	√
Radio state/Two-way radio state switch	√	√	√
Sweep function	√	√	√
Whether monitor receiving signal under radio state	√	√	√
Setting alien frequency value	√	×	×
Unlock/lock numerical keypad	√	√	√
Selecting high/Low power	√	√	√
Display mode switch	√	√	√

Remark: √ allowable × prohibited

Appendices

Appendix 2 Optional Accessories

Antenna

1+1 Smart charger

Li-ion Battery

Belt clip

Power adapter

Appendix 3 Technical Parameter List

Item		Content	
Frequency range		U：400～470MHz	
Channel Capacity		99	
Channel Spacing		12.5KHz	
Operating Voltage		7.5V	
Battery		1200mAh(Li-ion)	
Frequency stability		±2.5ppm	
Operating Temperature		-20°C～+55°C	
Antenna impedance		50Ω	
Dimension (Height×Width×Depth)		99mm×52mm×25mm	
Weight (including antenna and battery)		182g	
Transmitter		Receiver	
RF Power Output	5W	Sensitivity	≤0.2uV
Modulation	F3E	Modulated receiving bandwidth	±5KHz
Spurious and Harmonics	≤-60dB	Selectivity	≥60dB
FM Noise	≤-40dB	Intermodulation	≥60dB
Audio Distortion	≤5%	Spurious Response Rejection	≥60dB
Maximum frequency offset	±5KHz	Rated Audio Power Output	≥500mW
Adjacent channel power	≤-65dB	Rated Audio Distortion	≤5%

Appendices

Appendix 5 CDCSS Parameter List (105 groups)

No	CDCSS	No	CDCSS	No	CDCSS	No	CDCSS
51	023	72	131	93	251	114	371
52	025	73	132	94	252	115	411
53	026	74	134	95	255	116	412
54	031	75	143	96	261	117	413
55	032	76	145	97	263	118	423
56	036	77	152	98	265	119	431
57	043	78	155	99	266	120	432
58	047	79	156	100	271	121	445
59	051	80	162	101	274	122	446
60	053	81	165	102	306	123	452
61	054	82	172	103	311	124	454
62	065	83	174	104	315	125	455
63	071	84	205	105	325	126	462
64	072	85	212	106	331	127	464
65	073	86	223	107	332	128	465
66	074	87	225	108	343	129	466
67	114	88	226	109	346	130	503
68	115	89	243	110	351	131	506
69	116	90	244	111	356	132	516
70	122	91	245	112	364	133	523
71	125	92	246	113	365	134	526

Appendices

Appendix 5 CDCSS Parameter List (105 groups)

No	CDCSS	No	CDCSS	No	CDCSS	No	CDCSS
135	532	141	627	147	664	153	734
136	546	142	631	148	703	154	743
137	565	143	632	149	712	155	754
138	606	144	645	150	723		
139	612	145	654	151	731		
140	624	146	662	152	732		

Appendices

Appendix 6 Glossary

Name	Description
Short press	Keypress operation that no longer than one second.
Long press	Keypress operation that lasts longer than one second.
Standby state	Under normal keypress mode, there is no keypress operation and the unit is ready for receiving the calling from the other party.
CTCSS/CDCSS	CTCSS/ CDCSS means CTCSS/CDCSS signaling, mainly used to avoid receiving irrelevant calling(s) on the same channel. If CTCSS/CDCSS is set, only the calling(s) of the same channel and CTCSS/ CDCSS signaling can be received. If CTCSS/ CDCSS signaling is not set, all callings on the same channel within effective communication range will be received. Whether the other Two-way radios set the same CTCSS/ CDCSS or do not set CTCSS/ CDCSS, they can still receive your calling.
Power saving mode	In order to save power and prolong standby time, the unit will automatically enter into inactive state when there is no signal received or any operation (no keypress or switching). It is a function that helps to lower power consumption.
Time out timer	Time out timer functions to prevent any calling party from occupying channel for too long time, to limit overtime transmission and protect Two-way radio against being damaged due to transmitting over long time.
Squelch level	In the receiving signals, there lies corresponding relation between noise and signal. The stronger the signal is, the weaker the noise is. The ratio of signal energy and noise energy be devided into several levels, each grade is one level, and the grade number is called squelch level. You

Appendices

Appendix 6 Glossary

Name	Description
Monitoring	It is one of receiving method used to receive weak signals. Press the dedicated key to connect to the receiving channel in a forced way, and the operator tries to recognize weak sound with his ears.
Transient state	Press and hold down the programming key to activate this state; release the key to inactivate the state.
Scanning	A kind of receiving method used in order to hear calling from all channels.
Priority channel sweeping	Give priority sweeping to the preset priority channels during the sweeping process
Busy channel lockout	The user prohibits transmitting signal on busy channel to avoid interference with other users' communication.
Voice-operated (VOX)	Once this function is enabled, it is allowed to start transmitting operation via voice without press PTT key.
Wired cloning	With this function, data in one Two-way radio is allowed to be cloned into other Two-way radios of the same model.
Power selection	This function enables you to select high power or low power according to actual conditions.
Emergency alarm	Press down the dedicated alarm key, and the Two-way radio will give an alarm at highest volume or send the preset alarm code to other handset or base station in order to get fast rescue.
Automatic power off (APO)	You may set automatic power-off time via shortcut or radio programming software according to the specific requirements. Before power off, the

Appendices

Appendix 6 Glossary

Name	Description
DTMF	It consists of high frequency group and low frequency group, which contain four frequencies respectively. One HF signal and one LF signal superposed to form a compound signal that stands for a number. DTMF signaling includes 16 codes. DTMF signaling can be used to select and call the corresponding Two-way radio.
Remote Disabling	As the name implies, it means disabling by remote control. After the remote disabling code is set via radio programming software, you may select transmitting remote disabling or transmitting and receiving remote disabling. Once the information sent via remote disabling code (ID code of the other party's walkie-talkie) is received, the Two-way radio will prohibit transmitting or both transmitting and receiving are prohibited. You then have to change setting via radio programming software before using.
Alien frequency function	Once this function is enabled, you are allowed to use a receiving frequency different from the transmitting frequency. The difference between transmitting frequency and receiving frequency is alien frequency value. After setting the alien frequency value, choosing of positive or negative potential difference will determine the difference between transmitting frequency and receiving frequency is positive or negative value. This function allows setting by shortcut and mainly used to enable operation via repeater.

Appendices

Appendix 7 Frequency Record List

Model: _____ Serial No.: _____

Channel	Transmitting frequency	Transmitting CTCSS/CDCSS	Receiving frequency	Receiving CTCSS/CDCSS
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

SAFETYTRAINING INFORMATION

Your BOND TELECOMMUNICATION CO., LIMITED radio generates RF electromagnetic energy during transmit mode. This radio is designed for and classified as “Occupational Use Only”, meaning it must be used only during the course of employment by individuals aware of the hazards, and the ways to minimize such hazards. This radio is NOT intended for use by the “General Population” in an uncontrolled environment.

This radio has been tested and complies with the FCC RF exposure limits for “Occupational Use Only”. In addition, your BOND TELECOMMUNICATION CO., LIMITED radio complies with the following Standards and Guidelines with regard to RF energy and electromagnetic energy levels and evaluation of such levels for exposure to humans:

- FCC OET Bulletin 65 Edition 97-01 Supplement C, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.
- American National Standards Institute (C95.1-1992), IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
- American National Standards Institute (C95.3-1992), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields– RF and Microwave.
- The following accessories are authorized for use with this product. Use of accessories other than those (listed in the instruction) specified may result in RF exposure levels exceed the FCC requirements for wireless RF exposure.

To ensure that your expose to RF electromagnetic energy is within the FCC allowable limits for occupational use, always adhere to the following guidelines:

- **DO NOT** operate the radio without a proper antenna attached, as this may damaged the radio and may also cause you to exceed FCC RF exposure limits. A proper antenna is the antenna supplied with this radio by the manufacturer or antenna specifically authorized by the manufacturer for use with this radio.
- **DO NOT** transmits 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. The radio is transmitting when the “TX indicator” lights red. You can cause the radio to transmit by pressing the “PTT” switch.
- **ALWAYS** keep the antenna at least 2.5 cm (1 inch) away from the body when transmitting and only use the HYT belt-clip which is listed in instructions when attaching the radio to your belt, etc., to ensure FCC RF exposure compliance requirements are not exceeded. To provide the recipients of your transmission the best sound quality, hold the antenna at least 5 cm (2 inches) from your mouth, and slightly off to one side.

The information listed above provides the user with the information needed to make him or her aware of RF exposure, and what to do to as-sure that this radio operates with the FCC RF exposure limits of this radio.

Electromagnetic Interference/Compatibility

During transmissions, your BOND TELECOMMUNICATION CO., LIMITED radio generates RF energy that can possibly cause interference with other devices or systems. To avoid such interference, turn off the radio in areas where signs are posted to do so. **DO NOT** operate the transmitter in areas that are sensitive to electromagnetic radiation such as hospitals, aircraft, and blasting sites.

Occupational/Controlled Use

The radio transmitter is used in situations in which persons are exposed as consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure.