

# AT COMMUNICATION

## PRC-3088 VHF HAND HELD TRANSCEIVER

### USER GUIDE

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## **1. INTRODUCTION**

PRC-3088 series transceivers is the latest generation VHF handheld radio developed in 2005 for tactical environments. It is fully compatible with the legacy radios such as AN/PRC-77 or AN/VRC-12 but it providing more reliable services which meets MIL-STD requirements and strict environmental standards.

PRC-3088 series transceivers are available in two modifications in analogue and digital. PRC-3088 is analog radio and PRC-3088D is Digital radio with recording/playing function.

### **Important**

To ensure that you use PRC-3088 transceiver correctly, read all instructions carefully before using.

Please keep this instruction manual which contains important operation instructions for this transceiver.

Please read the Safety Notes and make sure you understand them before using the transceiver.

## **2. SAFETY NOTES**

### **2.1 Precautions for safety**

Never hold the transceiver so that antenna is very close to, or touching any parts of the body, especially the face and eyes during transmitting. The transceiver will get best performance when microphone is 5 to 10 cm away from the lips and keep transceiver vertical.

Never turn to high volume level when using headset otherwise the loud voice may cause harm to your ears.

Do not use the transceiver in the places such as hospital, airplane and gas station etc. The Radio Frequency may be interference with the electronic equipment and eventually cause accident.

### **2.2 Precautions for transceiver**

Avoid to operate the transceiver in places subject to extremely high or low temperatures : over +60 C° or under -15C°

Avoid to operate with high output power for long time in case the transceiver damages by over heated.

Do not expose the transceiver under direct sunlight or place near the object which can emit heat.

### **2.3 Precautions for Battery**

Remove the battery if you intend to leave the transceiver unused for a long period.

Only use the batteries specified for using with this transceiver.

Do not heat, modify or attempt to disassemble the batteries

### **2.4 Precautions for Antenna**

Do not operate the radio without a proper antenna attached, as this may damage the radio.

Always keep the antenna at least 2.5cm away from the body when transmitting.

To provide the recipients of your transmission the best sound quality, hold the antenna at least 5cm from you mouth, and slightly off to one side.

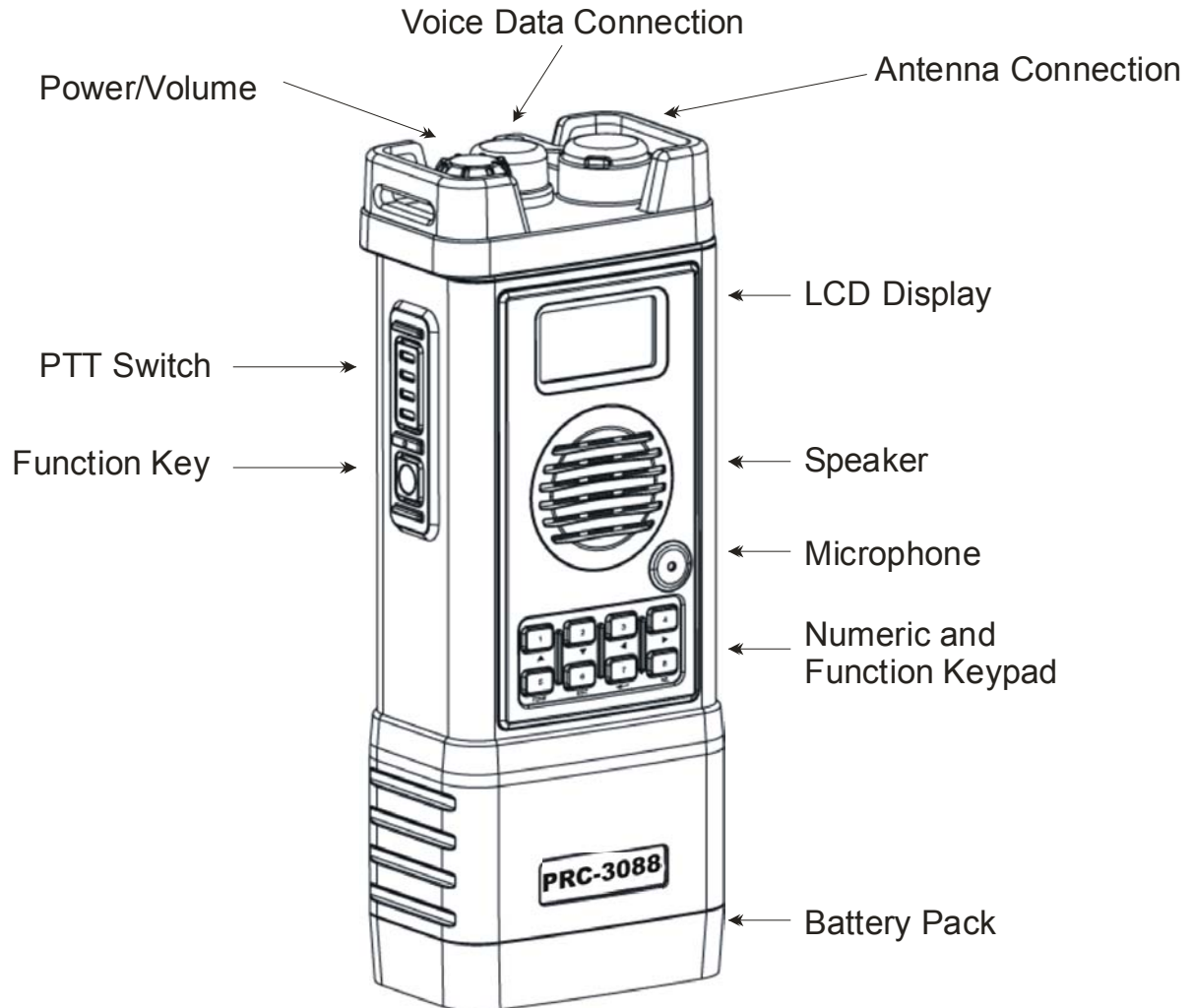
### **3. INTRODUCTION OF EQUIPMENT AND SUPPLIED ACCESSORIES**

#### **3.1 Main features**

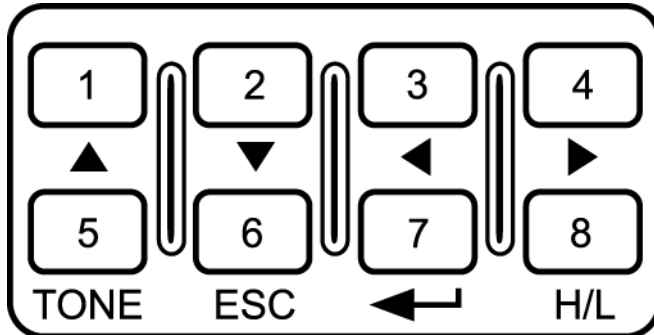
- Cover full military frequency range from 30 ~ 88 MHz
- 10 sets memory channels, each channel can be set different parameters
- Built in flash for recording/playing function (only in PRC-3088D)
- Except 150Hz tone, extra 39 sets CTCSS and 83 set DCS to prevent interference
- Various Scan functions selection
- Voice scrambler (Analog)
- Output power selection
- Wide or Narrow channel step selection : 25KHz or 12.5KHz
- Data transfer with CRC and FEC function to minimize wrong transferring
- Base/Repeater function
- Built in data module 1200/2400Bps, compatible with RS232C standard interface
- PC connection
- Built in dynamic antenna matching network
- Offset frequency
- Functional keypad
- LED backlight















## **3.2 Parts Introduction**

### **3.2.1 Parts Introduction**

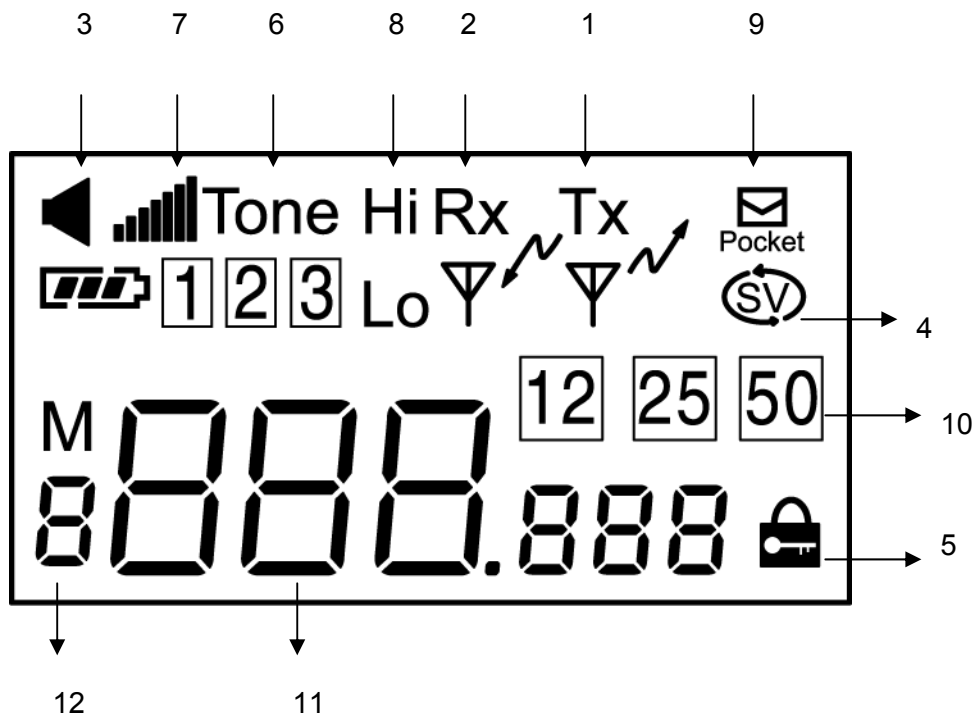


### 3.2.2 Function keys introduction



	Keys	Functions
	PTT	Push and hold to transmit : release to receive
	 /	Enter/Exit functions mode
	 / 	Frequency/Channel/Option move upward
	 / 	Frequency/Channel/Option move
	 / 	Move to left
	 / 	Move to right
	 / <b>Tone</b>	Enable tone (force receive signal
	 / <b>ESC</b>	Exit
	 / 	Confirm then enter to standby mode
	 / <b>H/L</b>	Output power selection

### 3.2.3 Display Panel



Display Panel components;

1. **Transmitting Indicator:** Indicates PTT is activated and transceiver is transmitting.
2. **Receive Indicator:** Indicates when receiving signal.
3. **Battery capacity display:** Indicates the battery capacity, blinks when battery power is low.
4. **Scramble display:** Indicates voice scrambler is on.
5. **Key lock:** Indicates when key lock is enabled.
6. **Tone Mode:** Indicates the tone signalling mode.
7. **Volume:** Indicates volume level.
8. **Output power:** Indicates output power (high or low).
9. **Data:** Indicates data is transmitting.
10. **Channel space:** Indicates the channel space (default value is 25KHz).
11. **Frequency:** Indicates frequency.
12. **Channel storage:** Indicates the stored channel number.

### **3.2.4      *Supplied Accessories***

#### **3.2.4.1   *LiOn Battery***



#### **3.2.4.2   *AA type battery case***



#### **3.2.4.3   *Battery charger (BCBA-15)***



#### **3.2.4.4   *Speaker microphone***



**3.2.4.5** *70cm soft whip short antenna (AT-3090SW)*



**3.2.4.6** *Waterproof Carrying Case*



**3.2.4.7** *Behind the head earphone with microphone (HS-78)*



**3.2.4.8** *PTT S.W (water proof box)*



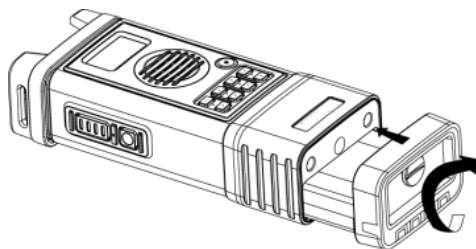
### **3.3 Battery pack replacement**

There are two types of battery to supply power to the transceiver.

- Li-ion battery pack (BP-18L)
- Battery case (BP-5AA)

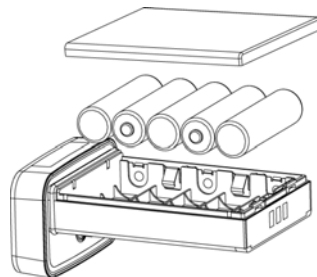
#### **3.3.1 Li-ion battery pack (BP-18L)**

- Turn off the power and place transceiver on a solid flat place before replacing the battery pack.
- Turn the screw located at the bottom of the transceiver in a anti-clockwise direction.
- Remove the battery pack form the transceiver's battery compartment.
- Insert the charged Li-ion battery pack into the battery compartment of transceiver.
- Make sure the battery pack and transceiver are connecting with each other firmly.
- Tighten the battery pack in to position by turning screw located at the bottom of the battery pack in a clockwise direction.



#### **3.3.2 Battery case (BP-5AA)**

When using BP-5AA battery case with the transceiver, install 5AA size alkaline batteries as illustrated below.



Close the battery cover

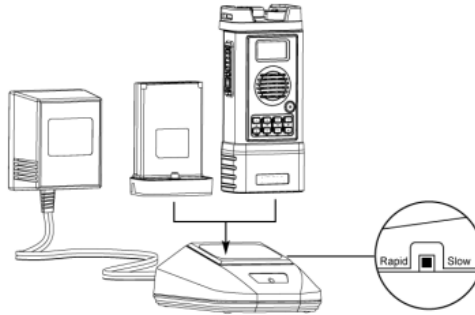
Follow the steps of the Li- ion battery pack (BP-18L) for installation

### **3.3.3 Notes about the batteries**

- Never use a battery when the outer casing is split or peeling as this could result in a short-circuit and cause major problems due to battery fluid leakage or overheating.
- Do not use batteries of different types or brands together and do not use new batteries together with used batteries.
- Do not charge any other type of batteries except the provided Li-ion battery pack (BP-18L)
- Do not heat the batteries or throw them into a fire
- Do not expose batteries to water. Dry the batteries with a soft cloth if they get wet.
- Do not carry or store the battery with metal objects that could come into contact with the terminals and short circuit the metal positive and negative poles of the battery.
- Do not attempt to deform, disassemble or modify the battery.
- When loading the batteries into the battery case, ensure that the battery polarity is as indicated on the battery pack.
- If you do not intend to use the transceiver for a long period of time, remove the battery pack from the transceiver.
- Always charge the provided Li-ion battery pack (BP-18L) before using. If the time for which a battery provides power shortens markedly when it has been correctly charged, this indicates that the battery has reached the end of its effective life and should be replaced.
- Keep battery contacts clean to keep good performance of the batteries.

### 3.4 Battery charger (BCBA-15)

The provided battery charger (BCBA-15) is only for the Li-ion battery pack (BP-18L) charging.



#### 3.4.1 Operation procedures :

- Connect AC power with the adapter
- Insert the Li-ion battery pack (BP-18L) inside the charger.
- Select rapid or standard charging by the switch which is at the side of charger.
- When the charging light flashes once per 7.5 seconds, it means the battery power is full. Take out the Li-ion battery pack (BP-18L) from the charger.

#### 3.4.2 Explanation of the indication lights

- Rapid charge : the light flashes 3 times / 2 seconds
- Standard charge : the light flashes once / 2 seconds
- Battery full : the light flashes once / 7.5 seconds
- Battery fault : the light keeps on

#### 3.4.3 Battery charging time :

Battery Type	Volt	Capacity	Charging Time		Battery operation time
			Standard	Rapid	
BP-5AA	Alkaline battery x 5pcs		DO NOT CHARGE		
BP-18L  (Li-ion)	7.4V	1850mAh	4.5 hours	1.8 hours	12.5 hours

### **3.5 Speaker-microphone (SM-200WP)**

The Speaker-microphone (SM-200WP) provides convenient operation while carrying the transceiver in the carrying case. It contains speaker, microphone, PTT button and back clip.

#### **Installation**

- Put out the Voice/Data connector cover which is on the top of the transceiver.
- Attach the cable connector of Speaker-microphone (SM-200WP) onto the Voice/Data connector.
- Rotate the cable connector of Speaker-microphone (SM-200WP) to right direction until a “click” sound occur, they are connected tightly now.



#### **3.5.1 Operation**

- Turn on the power of transceiver
- Select the channel
- Push and hold the PTT button to transmitting signal; release to receiving signal

#### **3.5.2 Speaker Microphone Removal**

- Turn off the power
- Hold the connector of speaker microphone then turn it to left to loose it from the transceiver..

### **3.6 Antenna Installation (AT-3090LW/AT-3090SW)**



- Turn off the power
- Open the anti-dust cover which on the antenna connector.
- Put the antenna into the antenna connector.
- Hold the part of antenna which near the antenna connector then turn it to right direction to tighten it.

#### **3.6.1 Antenna Removal (AT-3090LW/AT-3090SW)**

- Turn off the power
- Hold the part of antenna which is near the connector then turn it to left
- Remove the antenna from the antenna connector.

## **4. BASIC OPERATION**

### **4.1 Before operation**

Before turning on power, ensure all the required accessories such as antenna, battery pack and speaker-microphone were connected firmly.

### **4.2 Turn On Power**

- Rotate the Power/Volume dial in a clockwise right direction until a “click” sound is heard.
- All the display icons will be illuminated for 3 seconds in a power on self test mode.
- The transceiver starts to receive once the power has been turned on.
- The transceiver will switch to standby mode if there are no error signals or alarms.

### **4.3 Sound level control**

Rotate the Power/Volume dial clockwise to increase sound level, rotate anticlockwise to decrease sound level.

Notes : You can see the sound level from the displaying Icon



Low Level



Medium Level



High Level

### **4.4 Enter / Exit different modes**

#### **4.4.1 Standby mode**

This is an initial mode, transceiver will enter standby mode after power is turned on.



*Standby Mode*

#### **4.4.2 Memory channel receiving mode**

There are 10 channels which can be stored in PRC-3088 with specific settings for each channel. Switch to this mode to select the programmed channel.

Operation steps :

Under standby mode → push key F → push key 1 → enter memory channel receiving mode  
→ push key 1 or 2 to select channel



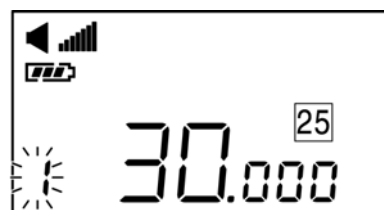
*Memory channel receiving Mode- memory channel 1*

#### **4.4.3 Memory channel programming mode**

This is design to store the frequent used frequencies with specific settings for each frequency.

Operation steps :

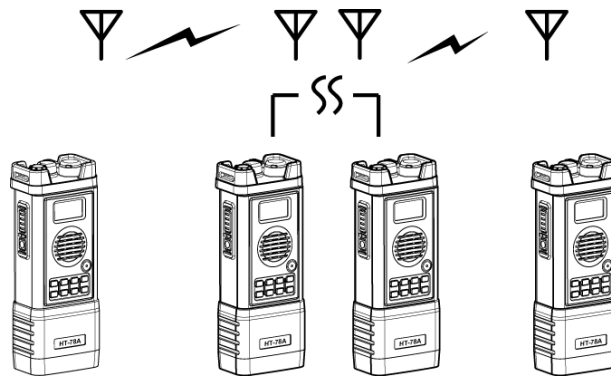
Under standby mode/ Memory channel receiving mode → push key F → push key 2 → enter memory channel programming mode → push key 6 → exit to previous mode.



*Memory Channel Programming Mode*

#### **4.4.4 Repeater mode**

You can install two sets of PRC-3088 between another two sets of PRC-3088 to work as a repeater to lengthen the coverage distance.



#### Operation Steps :

Under standby mode/ Memory channel receiving mode → push key F → push key7 → push key 8 → push key 4 → enter repeater mode → in channel 8 (receiving channel) → push PTT to transmit (in channel 9)→ push key F → push key7 → push key 8 → push key 4→ exit to previous mode.

Notes : you can adjust the frequencies of channel 8 and 9 under Memory channel programming mode.

#### 4.4.5 Repeater Function

This is only for units with built-in repeater function. UNITS WITH REPEATER FUNCTION DO NOT HAVE RECORDING FUNCTIONS. Repeater function requires 2 sets of PRC-3088D, one to use as TRANSMITTER and the other as RECEIVER.

F+7+8+1: Enable/Disable Repeater function. (Unit automatically switches to receiver mode when enabled. Press 1 or 2 to switch between transmitter and receiver modes.)

Setting Up Repeater Function (REPEATER FUNCTION REQUIRES HARDWARE MODIFICATION ON THE PRC-3088D)

You will need:

2 x PRC-3088D with Repeater function

1 x Repeater cable

At least another 2 sets Regular PRC-3088D to check functionality of repeater function

1) Set up the frequencies of the radios:

- a) Setup channel frequencies for Ch 8 for Rx (Receiving) and Ch 9 for Tx (Transmitting) on the Regular PRC-3088D's.
- b) Setup the frequencies in for the Repeater PRC-3088D's in reverse order. (For example, if 45.175Mhz is use for Ch 8 and 60.000Mhz for Ch 9 on the Regular

Radios, the Repeater Radios must use 45.175Mhz on Ch 9 and 60.000Mhz on Ch 8.

- 2) Connect both ends of repeater cables to the connector on top of each Repeater Radio.
- 3) Press Function key F + 7 + 8 + 4 to activate the Regular Radios for repeater use.
- 4) Press Function key F + 7 + 8 + 8 on each of the Repeater Radios and use #1 button to toggle between E and F as indicated on LCD panel. E is for Rx frequency and **MUST BE THE SAME** as the Transmitting frequency of the Regular Radios. The other Repeater Radio will be assigned F for Tx and the frequency **MUST BE THE SAME** as the Receiving frequency of the Regular Radios.

When using the Repeater function as RECEIVER, the first LED digit shows “E” on the display. (Only for units with built-in repeater function)

When using the Repeater function as TRANSMITTER, the first LED digit shows “F” on the display. (Only for units with built-in repeater function)

#### **4.5 Frequency Setting by tuning step**

Operation Steps :

Under standby mode → push keys 1 or 2 (up/down keys ▲ ▼) to adjust the frequency by tuning step (initial tuning step is 25KHz, you can adjust the tuning steps :12 / 50KHz by software). Push key 3 to left/ key 4 to right to move to the digit you want to adjust.

Example 1 – Initial frequency 30.000. When entering 30.025 with tuning step 25KHz

Standby mode → Push key 1 once → 30.025 → push key 1 again → 30.050 → push key 2 → 30.025



*Initial Frequency 30MHz*

*Push Key 1 once*

*Push Key 1 again*

Example 2 – when entering 40.025 after example 1

Standby mode → push key 3 → push and hold key 1 → 40.025

Standby mode → push key 3 three times to move to MHz digits → push key 1 → 40.025

Notes : If you want to move the digits from left to right, push key 4

Notes : There are 3 tuning steps : 12 / 25 / 50KHz. Default value is 25KHz; 12KHz and 50KHz can be set by software only.

4.6 Tone Setting

Operation Steps :

Under standby mode, push key F → push key 3 → push keys 1 or 2 to switch tone selections.

Tone 1 : 150Hz

Tone 2 : CTCSS


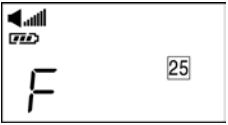
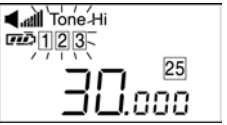

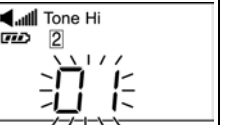
Tone 3 : DCS



*Tone Setting*

Example 1 – when entering Tone 2 with frequency code 01

Push key F → push key 3 → push key 1 or 2 to select tone 2→ push key 4 to enter code setting → push key 1 or 2 to adjust the code number.

				
Standby	Push Function Key	Push Key 1	Select Tone 2	Push key 1 or 2 to enter code number selection

4.7 Power output selection

Operation Steps :

Under standby mode → push key 8 to switch high or low level



*Select Hi Output Power*


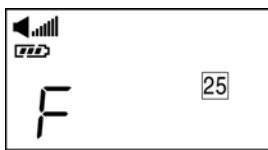

#### 4.8 Scrambler setting

Enable Scrambler Operation Steps :

Under standby mode → push key F → push key 6 to enable scrambler, push it again to disable scrambler

Disable Scrambler Operation Steps :

Under standby mode → push key F → push key 6 to disable scrambler, push it again to enable scrambler

		
Standby Mode	Push Function Key	Push key 6 to enable or disable scrambler

#### 4.9 Key Lock

Enable Key Lock Operation Steps :

Under standby mode → push key F → push key 4 to enable key lock, push key 4 again to disable key lock

Disable Key Lock Operation Steps :

Under standby mode → push key F → push key 4 to disable key lock, push key 4 again to enable key lock

#### 4.10 Save Settings

After setting of all your required functions, push key 6 to save the settings into the memory. Your saved settings will be resumed, after turning on power again.

Notes : It will resume to standby mode automatically after few seconds idling while input settings.

## 5. MEMORY CHANNEL PROGRAMMING

### 5.1 Enter / Exit Memory channel programming mode.

Operation Steps :




Under standby mode → push key F → push key 2 → enter memory channel programming mode → push key F → push key 2 → exit memory channel programming mode

Notes : If you want to enter memory channel receiving mode, push key F then push key 1 to enter. If you want to exit, push key F then push key 1 to exit to standby mode.

### 5.2 Select memory channel

Operation Steps :





After enter memory channel programming mode → memory channel number flashing → push key 1 or 2 to select channel number

		
Standby Mode	Push Function Key	Push key 2 to enter memory channel program

### 5.3 Frequency setting

Operation Steps :

After setting channel number → push key 4 → the first 2 digits flashing → push key 1 or 2 to adjust frequency → push key 4 → the first digits after decimal flashing → push key 1 or 2 to adjust → push key 4 → the last 2 digits flashing → push key 1 or 2 to adjust

			
Select channel 1 by pushing key 1 or 2	Select channel 1 by pushing key 1 or 2	Push key 4	Push key 4 again to the last 2 digits

#### **5.4 Tone setting**

Operation Steps :

After setting frequency → push key 4 → tone selections flashing → push key 1 or 2 to select tone

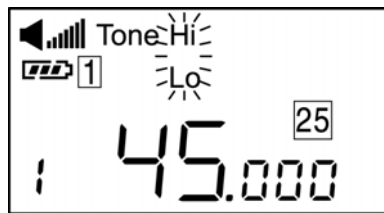


*After frequency set, push key 4 to select tone*

#### **5.5 Output power setting**

Operation Steps :

After setting tone → push key 4 → Hi or Lo flashing → push key 1 or 2 to select output power



*Push key 4 again to select output power*

#### **5.6 Scrambler setting**

Operation Steps :

After setting output power → push key 4 → SV flashing → push key 1 or 2 to enable or disable scrambler

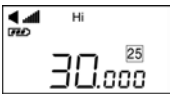
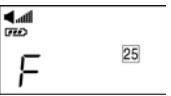






*Push key 4 again to enable or disable scrambler*

### 5.7 Delete memory channel settings

Operation Steps :

Under standby mode → push key F → push key 1 → enter memory channel setting mode  
 → push key 1 or 2 to select the channel you want to delete → push and hold key 6 → “dEL” display → push 7 to delete → display next channel

					
Standby mode	Push function key	Push key 1 enter memory channel setting mode	Push key 1 or 2 to select channel	Push and hold key 6	Next channel display after deleted previous channel

### 5.8 Start/Stop recording

Operation Steps :

Under standby mode: push key F → push key 7 → push key 8 → push key 1 → start or stop recording under analog or digital mode, 70 sec. for each section, 64 sections at most

### 5.9 Analog/Digital mode switch

Operation Steps :

Under Stand-by mode push key F → push key 7 → push key 8 → push key 8 → switch between analog/digital modes

When using digital mode, the top horizontal line of second LED digit will appear

### 5.10 Start/Stop recording under analog/digital mode

Operation Steps :

Under standby mode → push key F → push key 7 → push key 8 → push key 1 → start digital mode, display will show “-“ xx1 , and display will show “ | ” when the recording function starts xx2

When using the recording function, the top vertical line on the left side of second LED digit will appear.

### 5.11 Analog/Digital start playing/stop playing the recording

Operation Steps :

Under standby mode → push key F → push key 7 → push key 8 → push key 6 → start playing the recording → push key 1 → leap to the next section and play

→push key 2 → leap to the previous section and play

If the section is the first one, it will go back to play the last section.

When using the playback function, the bottom horizontal line of second LED digit will appear.

The recording time of each section is approximately 1 minute.

**When start playing, it displays “ – “ at the bottom. Xx3**

**Note: (Firmware version 004)**

F+7+8+2 set will delete all the recording contents and format the storage space. Other firmware version numbers will not execute this function. *(Due to F+7+8+2 is also used for enabling the backlight of LED, this delete function is only effective when backlight is on. When backlight is off, this delete function will not work.)*

## **6. EXTRA FUNCTIONS**

Apart for the basic settings introduced in previous chapters, there are many other functions such as LCD backlight, power saver, key lock, repeater mode and frequency scan etc.

Please refer the function key tables in section 7 to help you to search for the quick operating instructions.

### **6.1 LCD backlight**

Enable Operation Steps :

Push key F → push key 7 → push key 8 → push key 2 → turn on LCD backlight continuously

Disable Operation Steps :

Push key F → push key 7 → push key 8 → push key 2 → turn off LCD backlight

Notes : when you push key F, LCD backlight will be turned on no matter of LCD backlight disabled.

### **6.2 Power saver**

Enable Operation Steps :

Under standby mode/memory channel receiving mode → push key F → push key 7 → push key 8 → push key 3 → power saver enable → display “—” before frequency ( for example : — 30.000)



*Power Saver Enabled*

Disable Operation Steps :

Under standby mode/memory channel receiving mode → push key F → push key 7 → push key 8 → push key 3 → power saver disable → “—” before frequency disappear (for example : 30.000)

### **6.3 Key Lock**

The key lock function prevents accidental frequency changes and function activation.

Enable : Push key F → push key 4 → “ lock” display

Disable : Push key F → push key 4 → “lock” disappear



*Key lock enabled*

Notes : Any keys are not functioning after Key lock enabled

#### 6.4 Compulsory receiving

Operation Steps :

Under standby/memory channel mode → push and hold key 5 → RX display

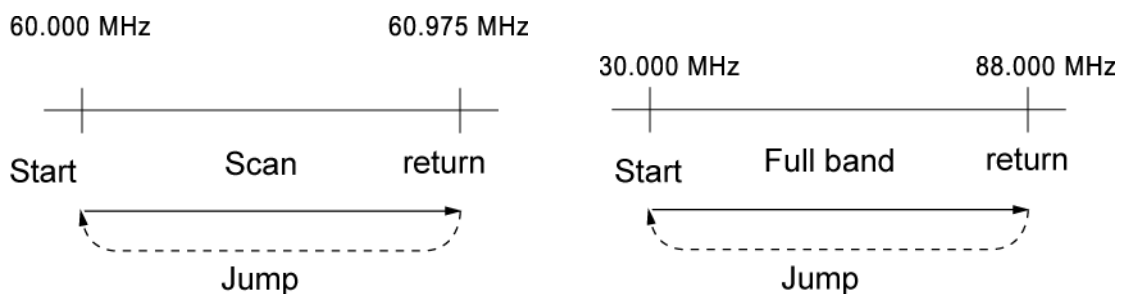
Notes : when the signal becomes weak cause transceiver cannot receive the signal automatically. You can use compulsory receiving function to receive the signal.



*Compulsory receiving enabled*

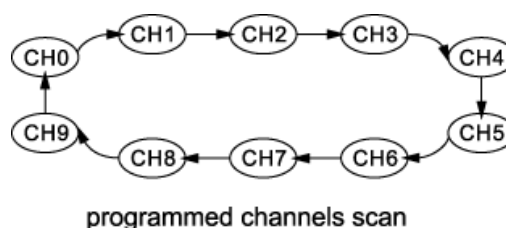
#### 6.5 Frequency Scans

There are 3 types of frequency scan:



*Full band scan*

*Selected frequency range scan*



### **6.5.1 Memory channels scan**

Operation Steps :

Under standby mode → push key F → push key 8 → starting to scan the memory channels → push key 6 → stop the scan → push PPT → transmitting signal under the channel which at the stop of scanning → push key F → continue scan

### **6.5.2 Selected frequency band scan**

Operation Steps :

Under standby mode → push key F → key 7 → push key 8 → push key 5 → start scan → push key 6 → stop the scan → push PPT → transmitting signal under the channel which at the stop of scanning → push key F → continue scan

Notes : This type of scan is designed to scan with maximum band width of 1Mhz. For example : start scan under 40.000, it will scanning between 40.000 and 40.975

Notes : the scanning will be stopped for 5 seconds when there is a signal received, it will continue scanning after 5 seconds if no operation

### **6.5.3 Full band scan**

Operation Steps :










Under memory channel mode → push key F → push key 7 → push key 8 → push key 6 → start the scan between 30.000 and 88.000 → push key 6 → stop the scan → push PPT → transmitting signal under the channel which is at the stop of scanning → push key F → continue scan

Notes : the scanning will be stopped for 5 seconds when there is a signal received, it will continue scanning after 5 seconds if no operation

## 7. FUNCTION KEYS OPERATION TABLE

















The function keys operation tables in this chapter included function keys instruction and explanation.

### 7.1 Single keys operation

Keys	Functions
Transfer Key	Push to transmit signal, release to standby mode
Setting 	Enter/Exit Advanced function
	Number 1 / frequency / channel / option move upward
	Number 2 / frequency / channel / option move downward
	Number 3 / Move to left
	Number 4 / Move to right
 Tone	Number 5 / Open Tone (Compulsorily receive)
 Exit	Number 6 / Exit
 Confirm	Number 7 / Confirm and enter standby mode
 Output power	Number 8 / Select output power

### 7.2 Function keys operation







Functional Key Table

(1)	【 Setting  】 + 【  】	Standby / memory channel mode
(2)	【 Setting  】 + 【  】	Enter memory channel setting
(3)	【 Setting  】 + 【  】	Enter tone setting
(4)	【 Setting  】 + 【  】	Key lock enable/disable
(5)	【 Setting  】 + 【  Tone 】	Key beep sound enable/disable
(6)	【 Setting  】 + 【  Exit 】	Scramble enable/disable
(7)	【 Setting  】 + 【  Confir 】	For advanced functional key, refer to
(8)	【 Setting  】 + 【  Outputpower 】	Enable memory channels scanning *

\* Minimum 2 memorized channels to enable memory channels scanning function

### 7.3 Advanced function keys operation

#### AdvancedFunctionalKeys

(1)	 + [7] + [8] + [2]	LCDBacklightauto/continuoousswitch
(2)	 + [7] + [8] + [3]	PowerSaveenable/disable
(3)	 + [7] + [8] + [4]	Dualbandcommunicationenable/disable
(4)	 + [7] + [8] + [5]	Specificfrequencyscanningenable
(5)	 + [7] + [8] + [6]	Fullband(30~88MHz)scanningenable
(6)	 + [7] + [8] + [7]	Outputpowertestingmodeenable/disable

- (7) [●] + [7] + [8] + [1] Start /Stop recording
- (8) [●] + [7] + [8] + [8] Analog/Digital speech switch

## 8. TONE FREQUENCIES TABLE

There are 2 tables for CTCSS and DCS tone setting. Each tone code in tables represents one specific frequency

### 8.1 CTCSS frequencies table

CTCSS Code to Frequency Table

Tone	Freq (Hz)	Tone	Freq (Hz)
		20	131.8
01	67.0	21	136.5
02	71.9	22	141.3
03	74.4	23	146.2
04	77.0	24	151.4
05	79.7	25	156.7
06	82.5	26	162.2
07	85.4	27	167.9
08	88.5	28	173.8
09	91.5	29	179.9
10	94.8	30	186.2
11	97.4	31	192.8
12	100.0	32	203.5
13	103.5	33	210.7
14	107.2	34	218.1
15	110.9	35	225.7
16	114.8	36	233.6
17	118.8	37	241.8
18	123.0	38	250.3
19	127.3	39	69.3

## 8.2 DCS frequencies table

DCS Code Reference Table

DCS	DCS Bits 22-12	DCS Bits 11-0	DCS	DCS Bits 22-12	DCS Bits 11-0	DCS	DCS Bits 22-12	DCS Bits 11-0
023	763	813	174	18B	87C	445	7B8	925
025	6B7	815	205	6E9	885	464	27E	934
026	65D	816	223	68E	893	465	60B	935
031	51F	819	226	7B0	896	466	6E1	936
032	5F5	81A	243	45B	8A3	503	3C6	943
043	5B6	823	244	1FA	8A4	506	2F8	946
047	0FD	827	245	58F	8A5	516	41B	94E
051	7CA	829	251	627	8A9	532	0E3	95A
054	6F4	82C	261	177	8B1	546	19E	966
065	5D1	835	263	5E8	8B3	565	0C7	975
071	679	839	265	43C	8B5	606	5D9	986
072	693	83A	271	794	8B9	612	671	98A
073	2E6	83B	306	0CF	8C6	624	0F5	994
074	747	83C	311	38D	8C9	627	01F	997
114	35E	84C	315	6C6	8CD	631	728	999
115	72B	84D	331	231	8D9	632	7C2	99A
116	7CE	84E	343	297	8E3	654	4C3	9AC
125	07B	855	346	3A9	8E6	662	247	9B2
131	3D3	859	351	0EB	8E9	664	393	9B4
132	339	85A	364	685	8F4	703	22B	9C3
134	2ED	85C	365	2F0	8F5	712	0BD	9CA
143	37A	863	371	158	8F9	723	398	9D3
152	1EC	86A	411	776	909	731	1E4	9D9
155	44D	86D	412	79C	90A	732	10E	9DA
156	4AC	86E	413	3E9	90B	734	0DA	9DC
162	6BC	872	423	4B9	913	743	14D	9E3
165	31D	875	431	6C5	919	754	20F	9EC
172	05F	87A	432	62F	91A			

## **9. SPECIFICATIONS :**

### **9.1 General**

Measurements method	: TIA/EIA-603
Frequency coverage	: 30.000-88.000MHz
Type of emission	: 16K0F3E
Channel spacing	: 25KHz
Number of channels	: 2321
Number of preset channels	: 10
Power supply requirements	: 7.4V DC (supplied battery pack)
Current drain (approx.)	: Standby : : Less than 60mA (Power save mode) : Less than 140mA(Normal mode) : Rx(middle volume) : Less than 250mA : Tx(More than 1 Watt): Less than 800mA
Services :	Selective call : CTCSS, DCS or 150Hz tone Squelch : Noise, CTCSS, DCS or 150Hz tone Build in modem : 1200/2400 bps MSK modem with FEC
Frequency error	: $\pm 3$ ppm
Interface	: RS232C/E
Antenna	: Build in antenna matching network. An extra 50 $\Omega$ output provided (For booster or testing use.)
Protection against	: Over heat/current of PA

### **9.2 Mechanical Characteristics and Environment**

Tested according to	: MIL-STD-810C/D/E
Usable temperature range	: -25 °C to +70 °C

Dimensions	: 173x63x42.5mm
Weight	: under 480g (with lithium pack without antenna)
Water tightness	: The radio set is immersion-proof under 1M of water during 2 hours EMI/EMC : RE02, RS03 according to MIL-STD-461C
MTTR	: 10 minutes
MTBF	: 5500 hours

### **9.3 Transmitter**

RF output power	: 0.5-1.5 Watt. with APC
Modulation system	: Variable reactance frequency modulation
Max. permissible deviation	: $\pm 5$ KHz
Spurious emissions	: 63 dBc (70 dBc typical)
Harmonic Radiations	: Better than 40 dBc (2nd) Better than 55 dBc (4th and above)
Adjacent channel power	: 65dBc
Audio frequency response	: a. +2.5 dB/-3dB range from 300Hz to 3000Hz (Factory default) : b. +2dB to -8dB of 6dB/octave from 300Hz to 3000Hz(programmable)
Audio distortion	: Less than 5% (3% typical)

### **9.4 Receiver**

Receive system	: Double-conversion superheterodyne system
Intermediated frequencies	: 1st 130.05MHz, 2nd 450KHz
Sensitivity	: Less than 0.45uV at 12dB SINAD(0.3uV typical)

Squelch sensitivity	: Less than 0.45uV(0.3uV typical)
IF Rejection	: Better than 63dB (70dB typical)
Image Rejection	: Better than 63dB (70dB typical)
Adjacent channel selectivity	: 60dB (typical)
Inter-modulation	: 60dB(typical)
Audio frequency response	: Within +3dB/-3dB from 300Hz to 3000 Hz
Audio output power	: 250mW typical at 5% distortion with an 16Ω load

### **9.5 Battery Pack**

BP-5AA : Waterproof battery case for 5xAA(R6) alkaline cells

BP-18L : Li-ion battery pack, 7.4V/1850mAh

Usable duration : 12.5 hours

: Rx:1.25 hours, Tx(1W) : 1.25 hours, Standby :10 hours

Cycling life : More than 300 times

### **9.6 Charger**

BC-150 (Desktop charger )

a. Fast charge current : 1.2A

b. Standard charge current : 0.48mA

c. Suitable for BP-18L pack, 4.5 hours for standard charge, 1.8 hours for fast charge

BAP-15 : Power supply for BC-200/150

Input voltage : 100 to 240V, AC

Output voltage : 10.8V (DC), 1.5A

### **9.7 External Speaker-Microphone**

SM-200WP (Water proof speaker microphone with PTT key)

- 1) Low impedance EC microphone
- 2) 16Ω, 250mW Speaker

## 10. TROUBLE SHOOTING

Normal problems troubleshooting procedure

Problems	Possible Causes				
	Transceiver	Battery Pack	Antenna	Speaker microphone	Charger
Cannot turn on power	Power/control/main board damaged	No power or damaged	—	—	AC adapter or power control damaged
No communication	Transceiving circuit damaged	—	Antenna damaged	Loose connection with transceiver	—
Poor communication quality	Transceiving circuit damaged	Low battery power	Loose connection with transceiver or loose shape	—	—
Display problems	Control module or display circuit damaged	—	—	—	—
Cannot transmit signal	Transmit signal key damaged	—	—	Connection cable damaged or transmit signal key damaged	Indication light or control circuit damaged
Received signal but no output from speaker	Mute mode error, speaker damaged	—	—	Connection cable or microphone damaged	—
No modulation when transmit signal	Modulation module or microphone damaged	—	—	Connection cable or microphone damaged	—
No indication light	—	—	—	—	Plug in power, AC adapter or power control unit damaged
Solution	Transceiver	Battery Pack	Antenna	Speaker microphone	Charger
	Check/replace transceiver	Check/replace battery/recharge battery	Check/replace antenna	Check/replace speaker microphone	Check/replace charger

## 11. MAINTENANCE

No.	Check Items	Procedure
1	Parts	Check all parts to confirm they are working normally
2	Housing	Clean the dust, filth and wet from the display and housing
3	Control	1. Check whether all control parts has damaged or loosed 2. Make sure the control parts are working smoothly during checking
4	Battery Pack	Check whether the battery are leaking, rusting or size increased. Uninstall battery when you don't use the device over one day
5		Check all parts to confirm they are working normally

Table 5-1 daily Maintenance

No.	Check Items	Procedures
1	Speaker Microphone	Check whether the connection cable was cut, knot or wear down
2	Carrying case	Whether it become moldy or teared
3	Antenna	Check if it has any damages and check whether the connector loosed or rusted

Table 5-2 Weekly Maintenance

AT COMMUNICATION

PRC-3088  
VHF HAND HELD  
TRANSCEIVER

USER GUIDE