



## **INSTRUCTION MANUAL**

### **MTD90**

### **FM TWO-WAY RADIO**





## Contents

## Page no

1. Foreword.....	4
2. Safety Information.....	4
3. Unpack and check Products.....	5
4. Battery Information.....	6
5. Accessories Assembly and Disassembly.....	8
6. Radio Overview.....	10
7. LCD Display.....	11
8. Basic Operations.....	12
9. Operation Modes.....	15
10. Other Auxiliary Functions.....	24
11. Troubleshooting.....	25
12. Specifications.....	26
13. CTCSS Table (Continuous Tone Coded Squelch System).....	27
14. DCS Table (Digital Coded Squelch).....	27

## 1. Foreword

Thank you for purchasing our MTD90 FM two way radio. This easy to use transceiver will always offer you reliable, clear and high efficiency communication services.

Please read this manual carefully before using this radio, the information presented herein will help you to find the maximum performance, operating method and maintenance of your radio.

## 2. Safety Information

Please read the following safety information in order to offer you security and high efficiency during operation.

- Please turn off the transceiver before entering an inflammable and explosive area.
- Do not replace or charge the battery when you are in an inflammable and explosive area.
- Please turn off the transceiver when you are close to the blast area or detonator zone.
- Do not use any transceiver which has a damaged antenna. It may cause a minor burn when the damaged antenna touches your skin.
- Do not attempt to dismantle the transceiver unless done by a professional technical person.
- To avoid the problems which caused by EMI and EMC, turn off your transceivers in any places where posted notices "Please turn off your transceivers". For example, the hospital or other health care places.
- Turn off your transceiver before boarding an aircraft. Any use of the transmitter must be in accordance with airline regulations or flight crew's instructions.
- In vehicles with air bags, do not put your transceiver within the air bag range if activated.
- Do not try to dismantle the transceiver, and it cannot be maintained by non-professional people as this may damage the transceiver.
- Do not expose the transceiver to direct sunshine or lay the transceiver on a hot surface. High temperature will reduce life span of the electronic components and cause distortion of the housing.
- Do not place the transceiver on a dusty or dirty place.
- Please keep the transceiver dry. Raindrops or moist air can erode the circuitry.
- When the portable transceiver is transmitting, please hold the transceiver in a vertical position and speak to the microphone.
- If you carry a transceiver on your body, please keep the antenna away from your body 2.5cm at least when the transceiver is transmitting.



### 3. Unpack and Check Products

Before using, we recommend you check as below:

Please check the package. Carefully unpack the transceiver to identify the items listed in the table below. If any items are missing or have been damaged during shipment, please contact the suppliers immediately.

Items	Quantity
Transceiver	1
Antenna	1
Li-ion Battery Pack	1
Charger	1
Adapter	1
Belt Clip	1
Screws for Belt Clip	2
Hand Strap	1
User's Manual	1

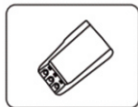
#### Main Accessories Images



Antenna



Main Unit



Li-ion Battery Pack



Charger



AC Power Supply



Belt Clip



Hand strap



User's Manual

#### Note:

Pictures are only for your references; please take the real objects as standard.

## **4. Battery Information**

### **Initial Use**

New batteries are not charged fully in the factory. Please charge it before using. In general, the battery should charge for 4 hours before initial use. The maximum battery capacity and performance is achieved after the battery has charged and discharged three times. When the battery power runs out, please recharge the battery or replace it.

### **Applicable Battery Pack**

Please only use the battery which is specified by the manufacturer. Unauthorized batteries may cause the failure of Ex-protection or bodily injury and property damages.

### **Safety Information**

1. Do not throw the battery into a fire!
2. Do not dispose of the battery with household garbage, it should be recycled and disposed correctly.
3. Never attempt to disassemble the battery pack.

### **Notices:**

- When charging your battery, please keep the ambient temperature among 5°C - 40°C.
- Please turn off the transceiver when the battery is charging. Using the transceiver during charging will affect the battery pack to charge normally.
- During charging, do not plug in/pull out the power supply or the battery frequently, it will affect the battery charging.
- Do not charge when the battery or transceiver is wet. Please dry it with a soft cloth before charging.
- The battery life is over when the operating time is obviously shorter than normal even if it's fully and correctly charged. Please replace with a new battery.

### **To Prolong Battery Life**

- Battery performance will degrade when the current temperature is below 0°C. A spare battery is necessary in cold weather. Please keep the cold batteries, these batteries may work under room temperature.
- If the battery contact is dusty, it may influence its normal use or normal charge.

### Battery Storage

- Fully charge a battery before you store it for a long time, to avoid battery damage caused by over-discharge.
- Recharge the battery after several months' storage (Li-Ion/Li-polymer battery: 6 months, NiMH battery: 3 months), to avoid battery capacity reducing caused by over-discharge.
- When storing your battery, keep it in a cool and dry place under room temperature.

### Charging the Battery

Only use the charger which is specified by the supplier. The charger's LED indicator would show you the charging status.

Please follow these steps to charge the battery:

1. Before charging, please plug the adaptor's cable into the charger's input jack.
2. Connect the adaptor to the AC Power socket. You will see a red light flash then go out.
3. Insert the transceiver or battery into the cradle of the charger. The LED glows red light and start to charge.
4. The battery charging will last about 4 hours. When the LED glows green, the battery is fully charged.
5. Please switch off the power and take out the transceiver or battery.

### Note:

1. Make sure the transceiver is switched off during charging.
2. Overcharging may affect the battery performance.

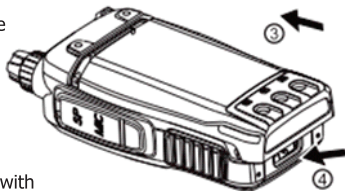


## 5. Accessories Assembly and Disassembly

### 5.1 Install & Remove the Battery

#### Install the Battery

1. Align the battery pack with the grooves on the chassis of transceiver.
2. Handhold the transceiver, and press the battery pack via thumb and forefinger.
3. Slide the battery pack upward until it slides into the grooves with a 'click'.
4. Push the battery pack latch leftward to lock-up it.



#### 5.2 Remove the Battery

1. Push the battery pack latch rightward and downward to unlock it.
2. When the battery pack is loosened from the groove of transceiver, remove the battery pack



### 5.3 Installing/Removing the Antenna

Hold the bottom end of the antenna and screw it clockwise onto the connector on the transceiver until it is tight. And counter-clockwise to screw it off the connector on the transceiver.

#### CAUTION:

Never hold the antenna, and sway the transceiver.



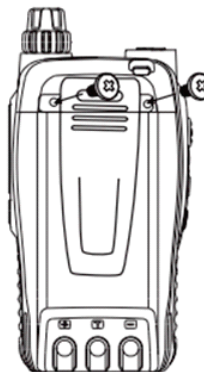
#### 5.4. Installing/Removing the Belt Clip

##### Installing the Belt Clip

1. Line up the holes and insert the 2 screws.
2. Use the correct screwdriver to tighten the screws.

##### Removing Belt Clip

Unscrew the 2 screws from the holes.



#### 5.5. Installing & Removing the Optional

##### Speaker/ MIC/Programming Cable

##### Install the Optional Speaker / MIC / Programming Cable

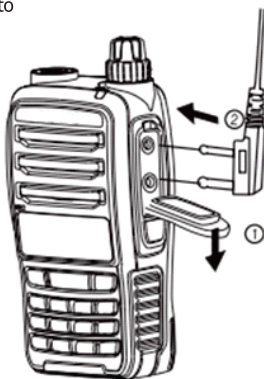
1. According to arrowhead direction ① to open the SP/MIC Cover②. Don't remove this cover completely.
2. Insert the SP/MIC plugs into the corresponding sockets. Refer to the image.

##### Remove the optional

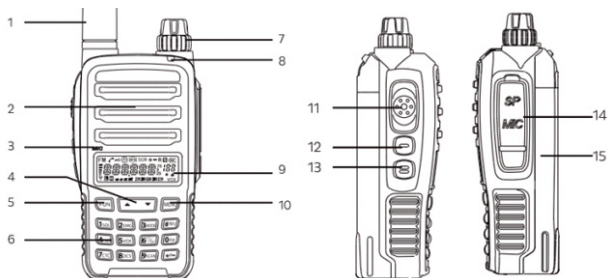
##### Speaker/MIC/Programming Cable

Take out the SP/MIC plugs.

**Note:** When using an external SP/MIC, this will affect the transceiver's water resistant capability.



## 6. Radio Overview



No	Items	Remarks
1	Antenna	Transmit/Receive signals, deliver wider communication coverage
2	Speaker	Broadcast signals and prompt tones
3	MIC	Microphone
4	Up/Down Key	Choose channels/frequencies in the menu status, it can be used in cooperation with other functions
5	FUN key	The key is used with other keys for different functions and to exit the menu after finishing the operation
6	Numeric key	Press numeric key to change frequency or channel or menu
7	Power supply switch/Volume adjustor	Turn clockwise to turn on the transceiver and turn counterclockwise to turn off the transceiver until a click sounds. Rotate it to adjust the volume level.
8	Status Indicator Light	Receiving: Green Light bright Transmitting: Red Light bright
9	LCD Display Screen	Show some settings of this unit
10	Confirmation/Menu key	Use to confirm the operation and return standby in the menu status
11	PTT(push to talk) Key	Press and hold the PTT key to transmit, and release it to receive
12	Lamp(Backlight)key	Turn on/off the LCD backlight
13	Monitor key	Press this key to monitor the background noise
14	SP/MIC jack	Dustproof and Rainproof
15	Battery	Supply voltage

## 7. LCD Display



Items	Remarks
	ANI indicator
	Keyboard lock indicator
	CTCSS receiving/transmitting signal indicator
	DCS receiving/transmitting signal indicator
	Different frequency direction indicator
<b>R</b>	Display when reverse frequency function is on
<b>S</b>	Save power indicator
	Battery capacity indicator
	Indicator of scanning channels
	Narrow bandwidth indicator
<b>VOX</b>	Display when VOX function is on
	Strong receiving field indicator(The more bars, the stronger signals)
<b>L</b>	Low transmitting power indicator
<b>H</b>	High transmitting power indicator
	Transmitting power indicator (The more bars, the greater transmitting power)
<b>FM</b>	Indicator when be in radio status
<b>SCR</b>	Invalidation in this edition

## 8. Basic Operations

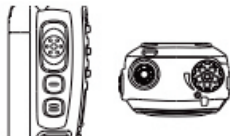
### 8.1. Turn on/off Power Supply of Transceiver

Rotate Power Supply Switch / Volume adjustor clockwise to turn on the transceiver with a "Click" sound, and rotate it counter-clockwise to turn off the transceiver with a "Click" sound. Rotate it to adjust the volume.



### 8.2. Adjusting Volume

While pressing and holding MONI key, rotate Power Supply Switch / Volume Adjustor to adjust volume of transceiver.



### 8.3. Transmission

While pressing and holding PTT key, speak into the microphone in your normal tone of voice. Please hold the microphone approximately 3-4cm from your mouth.

#### Note:

- When in VOX mode, you don't need to press PTT key and speak into the microphone.
- When the battery voltage is too low, the transmission will stop and the speaker utter Low Battery Alarm. (See Page 36 for details of "Low Battery Alarm")

### 8.4. Receiving

Release PTT key to receive the signals. To get the best voice clarity, please adjust to the proper volume.



## 8.5. Switching Channels

Press [MENU] key to enter menu mode. Press [▲] [1] [▼] key to choose the sixteenth menu item. The LCD will show "MOD". Press [MENU] key to enter this item, then press [▲] [1] [▼] key to choose operation mode **FR/MR/CH**. Press [ENTER] key to confirm your choice and return to previous menu.



### 8.5.1.Channel (CH) /Memory Mode(MR)

Under Channel / Memory mode, press [▲] [1] [▼] key to choose the channels you desired. If the channel you desired is far from the current channel, you can press numeric keys to input the channels NO. directly.



### 8.5.2. Frequency Mode(FR)

Under frequency mode, press [▲] [1] [▼] key to choose the frequency, or press numeric keys to input the frequency you desired directly. (This transceiver defaults the frequency step of 25KHz. To change the frequency step, refer to the "STEP" function on page 22.)



### 8.5.3. Storing the Channels

Under frequency mode, input the frequency you want to store. Press [FUN] + [MENU] key, the LCD will show "SAVE", then press [▲] [1] [▼] key or numeric keys to change the flickering number on the top right corner (To store the frequency in 21th channel, input 21. The maximum channel number is 199). Press [ENTER] key to confirm and return to standby status.



### 8.5.4. Deleting the Channels

To delete a channel, for examples: 21th channel, turn to memory mode and choose the 21th channel, then turn off the supply power of transceiver. Keep pressing [MENU] key and turn on the supply power, the LCD will show "DEL ? 21". Press [ENTER] key to confirm, the LCD will show "DELETE" and return to standby status. It means this channel is deleted successfully.



### 8.5.5. Scanning

In channel / memory mode, **[FUN]** + **[SCAN]** press key to scan the channels which be set **"SCN.ADD"**(See page 23. Refer to the details of Scan ADD/DEL function.). Press **[▲]** | **[▼]** key to adjust the direction of scanning. If you want to use the Priority Channels function, refer to page 17. In frequency mode, press **[FUN]** + **[SCAN]** key to scan the frequencies according to the frequency step (see page 22) and scan mode (see page 23). Press key to adjust the direction of scanning.



### 8.5.6. Reverse frequency

Press **[FUN]** + **[REV]** to active this function. This function will reverse the transmission frequency and receiving frequency, including the CTCSS/DCS encode and decode.

### 8.5.7. Cloning

Use clone cable to connect two transceivers via SP/MIC jack. First turn on supply power of SUB unit (cloned one). Then hold the **MONI** key of MAIN unit and turn on supply power. The LCD of MAIN unit will show **"CLONE?"**. Press **[FUN]** key of MAIN unit, the LCD will show **"CLONE"**. It means MAIN unit is transferring the data to SUB unit. If the data transfer is successful, the LCD will show **"SUCCESS"**. Here press any key (except PTT/MONI/LAMP/**[FUN]** key) to exit clone status. If the data transfer is not transferred, the LCD will show **"ERROR"**. Please check all the operation steps and cable connections, then press **[FUN]** key to clone again.




## 9. Operation Mode

### 9.1. Shortcut Key Operation

Press [FUNK] key, then press numeric keys to enter corresponding items. The functions operated by shortcut key are same as menu function. But the operation is more simple and convenient.

Shortcut Key	LCD Screen Display	Function Description	Parameter Settings / Selection	Ref. Page
[FUNK] + [1-5]	SQL.5	Squelch Levels Settings	00, 01, 02.....09	
[FUNK] + [2/100]	Nothing	Use the saved frequency	001-199	
[FUNK] + [3/MODE]	MODE.CH	Operation Mode Switch	FR/MR/CH	
[FUNK] + [4/H]	POW.H	High / Low Power Settings	H/L	
[FUNK] + [5/VOX]	VOX OFF	Voice-operated Transmission Levels Settings	OFF,1,2,3.....9	
[FUNK] + [6/CTC]	C OFF	CTCSS/DCS Encode /Decode Settings	OFF, 51CTC/107DCS	
[FUNK] + [7/DEC]	R OFF	CTCSS/DCS Decode Settings	OFF, 51CTC/107DCS	
[FUNK] + [8/ENC]	T OFF	CTCSS/DCS Encode Settings	OFF, 51CTC/107DCS	
[FUNK] + [9/SCAN]	Nothing	Scan Mode	CO/TO/SE	
[FUNK] + [0/RADIO]	RADIO	FM radio	Nothing	
[FUNK] + [10/REV]	Nothing	Reverse frequency	Nothing	
[FUNK] + [11/RTT]	CAL.OFF	Call tone	OFF/1/2/3	
<b>Hold on</b> [FUNK]	On	Keyboard Unlocking	Lock/Unlock	
[FUNK] + [12/SAVE]	SAVE	Storing Channels	001-199 Channel	

## 9.2. Menu Mode

Press  key to enter menu mode, then press  /  key to the menu items.

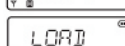
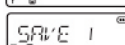
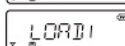
Menu NO.	LCD Screen Display	Function Description	Parameter Settings / Selection	Ref. Page
1	SCAN	Scan modes setting	CO/TO/SE	
2	TOT	Transmitter Time-out Timer Settings	OFF, 30,60,90...240S	
3	VOX	Voice-operated Transmission Levels Settings	OFF, 1,2,3...9	
4	CALL	Call Sound settings	OFF/1/2/3	
5	ROG	Roger Sound settings	OFF/1/2/3	
6	BEP	Beep Sound Settings	OFF/ON	
7	KY	Keyboard Lock Mode Settings	AUTO/MANU	
8	MEM	Emergency channel Setting	001-199	
9	LED	Backlight Settings	AUTO/OFF	
10	POW	High/Low Power Settings	H/L	
11	APO	Auto Power off Settings	OFF/10m/30m/1/h/2h	
12	CTSCAN	CTCSS SCAN	63.9-254.1	
13	DCSCAN	DCS SCAN	D017N-D754I	
14	SQL	Squelch Level Settings	OFF,1,2,3...9	
15	SAV	Power Saver	ON/OFF OFF/ON	
16	MODE	Operation Mode Switch	FR/MR/CH	
17	C	CTCSS/DCS Decoder & Encoder Settings	51CTS/107DNS	
18	R	CTCSS/DCS Decoder Settings	51CTS/107DNS	
19	T	CTCSS/DCS Encoder Settings	51CTS/107DNS	
20	OFFSET	Offset Value Settings	OKHz-70MHz	
21	SFT	Offset Direction Settings	OFF/+/-	
22	STEP	Frequency Step Settings	5K/6.25K/10K/12.5K/25K	
23	FMR FM	Radio Monitor Transceiver Signals	OFF/ON	
24	SCN	Scan Addition / Deletion	ADD/DEL	

## 9.2. Menu Mode Continued.

Menu NO.	LCD Screen Display	Function Description	Parameter Settings / Selection	Ref. Page
25	NAME	Named Channels Edit	*****	
26	NAM	Naming Channels Switch	OFF/ON	
27	PRI	Priority Channel Settings	OFF,1,2,3-199	
28	ANI	Automatic Number Identification Display	OFF/ON	
29	BUS	Busy Channel Lockup Settings	OFF/CAR/QDT	
30	N/W	Narrow/Width Bandwidth Settings	NAR/WID	
31	VOXDEL	VOX delay time	1/1.5/2/2.5/3S	
32	STE	Squelch Tail Elimination Settings	OFF/120/180	
33	DTMF	DTMF ON/OFF	ON/OFF	
34	LIGHT	Backlight Colors Setting	PURPLE/CYAN/ WHITE/RED/ GREEN/BLUE/ ORANGE	

## 9.3. FM Radio Mode









Under the standby status, press **[F.M.]** + **[ON/OFF]** key, the LCD will show "RADIO" about 2s, then enter FM radio mode. Press **[▲]** **[1]** **[▼]** key or numeric keys to input the broadcasting station frequencies you desired. The radio can receive the broadcasting station frequency band from 76.00MHz to 108.00MHz. If you don't know which stations are available, you can press **[F.M.]** key to scan the stations. When a station is found, it will stop scanning and rest on current station frequency. To scan other stations, press **[F.M.]** key again to continue scan. For simple and convenient listening to the radio, you can press **[MEM.]** key + 1-9 any one numeric key to store this station frequency (The radio can store maximum 9 station frequencies). To listen in the station you stored, press **[FUN.]** key + corresponding numeric key to select your stored station. If you want to exit the FM radio mode, press **[FUN.]** + **[ON/OFF]** key.









### 9.3. FM Radio Mode Continued...

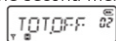
**Note:** If you turn on the "FMR" function (see the page 32 for details) under transceiver mode, the transceiver can transmit / receive the signals under FM radio mode. No matter what transmitting / receiving, it will switch to transceiver mode, but the top left corner of LCD will show "FM". When the transmitting and receiving is finished for 10s, and there is no other operation to keyboard during the 10s, the transceiver will automatically return to FM radio mode.

### 9.4. Menu Settings

Under the standby status, press  key to enter menu mode. Press / key to choose menu item, and press  key to enter this item. Press / key to choose settings or parameter. Lastly, press  key to confirm settings or parameter and return to previous menu. Or press  key (except CTCSS/DCS function) to confirm settings or parameter and return to standby status.







### 9.5. TOT: Transmitter Time-out Timer Settings

Under the menu mode, press / key to choose the second menu item, the LCD will show "TOT". Press  key to enter, then press / key to choose TOT time (OFF,30,60,90.....240, unit: second) . Press  key to confirm your choice and return to previous menu.



**Note:** TOT function can prevent one channel being occupied for a long time. Also prevents transceiver broken due to continue transmission for a long time. This function automatically stops transmission and a "beep" sounds if it continues beyond a specified time. Release the PTT key to stop the "beep" sounds. Then press PTT key again to resume transmission.

### 9.5. VOX: Voice-operated Transmission Levels Settings

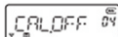
Under the menu mode, press / key to choose the third menu item, the LCD will show "VOX". Press  key to enter, then press / key to choose VOX levels (OFF,1,2,3.....9). Press  key to confirm your choice and return to previous menu.



**Note:** VOX function causes the unit to transmit without using the PTT key by simply speaking into the microphone. The higher VOX level, the quieter you need to speak into the mic. But it is easier to be affected by background noise.

### 9.6. CALL: Call Sound Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the fourth menu item, the LCD will show "CALL.OFF". Press  $\left[\text{ENT}\right]$  key to enter, then press key to choose roger sound types **OFF/1/2/3**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



### 9.7. ROG: Roger Sound Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the fifth menu item, the LCD will show "ROG.OFF". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose roger sound types **OFF/1/2/3**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



### 9.8. BEP: Beep Sound Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the sixth menu item, the LCD will show "BEP". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose beep sound **OFF/ON**. Press key to  $\left[\text{ENT}\right]$  confirm your choice and return to previous menu.



**Note:** This function is not only for the key-press beep sound, but also supports the alarm sound when the transmission is abnormal.

### 9.9. KY: Keyboard Lock Mode Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the seventh menu item, the LCD will show "KY". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the keyboard lock mode **AUTO/MANU**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



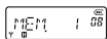
**AUTO:** In this mode, the keyboard automatically is locked when it has not had any operation within 30s.

**MANU:** In this mode, the keyboard isn't automatically locked, you have to lock it by manually.

**Note:** When the keyboard is locked, **PTT/MONI/LAMP/EMER** key can be used.

### 9.10. MEM: Emergency Channel Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the eighth menu item, the LCD will show "MEM.1". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose channel 1-199. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



**Note:** Press shortcut key  $\left[\text{FNC}\right] + \left[\text{CH}\right]$  you can use the already set channels.

### 9.11. LED: Backlight Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the ninth menu item, the LCD will show "LED". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose backlight mode **AUT/OFF/ON**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



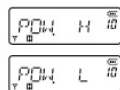
**AUT:** In this mode, press any key, the LCD / keyboard backlight will illuminate automatically.

**OFF:** In this mode, backlight will not illuminate under any operation or status, except when you press LAMP key.

**ON:** In this mode, backlight will remain illuminated all the time. If you want to turn off, press LAMP key.

### 9.12. POW: High / Low Power Settings

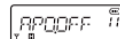
Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the tenth menu item, the LCD will show "POW". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose power H/L. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



**Note:** The higher power, the further the communication distance will be. This will however drain more battery capacity.

### 9.13. APO: Auto Power off Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the eleventh menu item, the LCD will show "APO". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose APO time



**OFF/10m/30m/1h/2h** ("m" is minutes, "h" is hour). Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.

### 9.14. CTSCAN: CTCSS Scan

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the twelfth menu item, the LCD will show "CTSCAN". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to change the scan direction.



When scanning the corresponding CTCSS, press  $\left[\text{ENT}\right]$  key to use the scanned CTCSS in current channel and return to previous menu, or press other key to stop scan.

### 9.15. DCSCAN: DCS Scan

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the thirteen menu item, the LCD will show "DCSCAN". Press

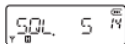


$\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to change the scan direction. When scanning the corresponding DCS, press  $\left[\text{ENT}\right]$  key to use the scanned DCS in current channel and return to previous menu, or press other key to stop scan.



### 9.16. SQL: Squelch Levels settings

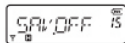
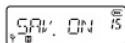
Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the fourteenth menu item, the LCD will show "SQL". Press  $\left[\text{ENT}\right]$  key to enter, then  $\left[\uparrow\right]/\left[\downarrow\right]$  press key to choose squelch levels (00,01,02\*\*\*\*\*09). Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



**Note:** The higher the level, the lower squelch noise you can receive.

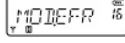
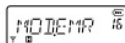
### 9.17. SAV: Power Saver ON/OFF

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the fifteenth menu item, the LCD will show "SAV". Press  $\left[\text{ENT}\right]$  key to enter, then  $\left[\uparrow\right]/\left[\downarrow\right]$  press key to choose power saver ON/OFF. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



### 9.18. MODE: Operation Mode Switch

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the sixteenth menu item, the LCD will show "MODE". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose operation mode FR/MR/CH. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



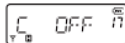
**FR:** Frequency mode.

**CH:** Channel mode.

**MR:** Memory mode.

### 9.19. C: CTCSS/DCS Decoder & Encoder Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the seventeenth menu item, the LCD will show "C". Press  $\left[\text{ENT}\right]$  key to enter CTCSS, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose CTCSS decodes & encodes. Or press  $\left[\text{CODE}\right]$  key to switch to DCS, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the DCS decodes (Press  $\left[\text{CODE}\right]$  key switch to N/I. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



**Note:**

1. There are 51 CTCSS and 107 DCS and non-standard 63.0-254.1/000n-7771 CTCSS/DCS for your choice.
2. CTCSS (Continuous Tone Coded Squelch System) / DCS (Digital Coded Squelch) allows you to ignore unwanted calls from other persons who are using the same frequency with different CTCSS/DCS. When you receive the signal with different CTCSS/DCS, you can't hear the calls, but the status indicator light will be green. Your transmission can only be received by the transceiver with same CTCSS/DCS.
3. The CTCSS/DCS decoder settings allow you to ignore unwanted calls.

### 9.20. R: CTCSS/DCS Decoder Settings

Under the menu mode, press  $\uparrow/\downarrow$  key to choose the eighteenth menu item, the LCD will show "R". Press  $\text{ENT}$  key and then press  $\text{ENT}$  to enter CTCSS, then press  $\uparrow/\downarrow$  key to choose CTCSS decodes. Or press  $\text{ENT}$  key to switch to DCS, press  $\uparrow/\downarrow$  key to choose the DCS decodes (Press  $\text{ENT}$  switch to N/I). Press  $\text{ENT}$  key to confirm your choice and return to previous menu.



### 9.21. T: CTCSS/DCS Encoder Settings

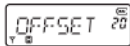
Under the menu mode, press  $\uparrow/\downarrow$  key to choose the nineteenth menu item, the LCD will show "T". Press  $\text{ENT}$  key and then press  $\text{ENT}$  to enter CTCSS, then press key to choose CTCSS encodes. Or press  $\text{ENT}$  key to switch to DCS, press  $\uparrow/\downarrow$  key to choose the DCS encodes (Press switch to  $\text{ENT}$  N/I). Press  $\text{ENT}$  key to confirm your choice and return to previous menu.



**Note:** Using the CTCSS/DCS encoder can prevent your calls from being heard, but it does mean your calls will be private.

### 9.22. OFFSET: Offset Value Settings

Under the menu mode, press  $\uparrow/\downarrow$  key to choose the twentieth menu item, the LCD will show "OFFSET". Press  $\text{ENT}$  key to enter, then press the key or numeric keys to choose offset value (0KHz-70MHz). Press  $\text{ENT}$  key to confirm your choice and return to previous menu.



**Note:** This function is operated under the frequency mode. If the offset value you setting is too big, it may result in the transmission frequency going beyond the frequency range of transmitter. So that the transceiver will be forbidden to transmit, and utter "du" sounds.

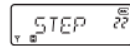
### 9.23. SFT: Offset Direction Settings

Under the menu mode, press  $\uparrow/\downarrow$  key to choose the twenty-first menu item, the LCD will show "SFT". Press  $\text{ENT}$  key to enter, then press  $\uparrow/\downarrow$  key to choose offset direction **OFF/ +/-**. Press  $\text{ENT}$  key to confirm your choice and return to previous menu.  
**+**: Positive offset direction.  
**-**: Negative offset direction.



### 9.24. STEP: Frequency Step Settings

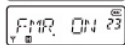
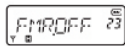
Under the menu mode, press  $\uparrow/\downarrow$  key to choose the twenty second menu item, the LCD will show "STEP". Press  $\text{ENT}$  key to enter, then press  $\uparrow/\downarrow$  key to choose frequency steps (5K/6.25K/10K/12.5K/25K unit:Hz). Press  $\text{ENT}$  key to confirm your choice and return to previous menu.



**Note:** This function is just operated under the frequency mode.

### 9.25. FMR: FM Radio Monitor Transceiver Signals

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the twenty third menu item, the LCD will show "FMR". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose this function **OFF/ON**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.

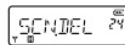


**OFF:** Under the FM radio mode, transceiver can not receive / transmit the signals.

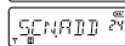
**ON:** Under the FM radio mode, transceiver can receive / transmit the signals.

### 9.26. SCN: Scan Addition / Deletion

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the twenty fourth menu item, the LCD will show "SCN".



Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose scan **ADD/DEL**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



**ADD:** Add the current channel into scan group.

**DEL:** Delete the current channel from the scan group.

### 9.27. NAME: Named Channels Edit

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the twenty fifth menu item, the LCD will show "NAME?".

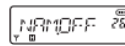


Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose a number, letter or sign to edit a blank. Then press  $\left[\text{FREQ}\right]$  key to edit next blank. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.

**Note:** This function allow you to edit maximum 6 blanks. Just be operated under the channel / memory mode.

### 9.28. NAM: Naming Channels ON/OFF

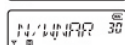
Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the twenty sixth menu item, the LCD will show "NAM". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose naming channels **ON/OFF**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.



**Note:** If you don't turn on this function, even though you edit the name into channels, the LCD still won't show the names.

### 9.29. N/W: Narrow / Width Bandwidth Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the thirtieth menu item, the LCD will show "N/W". Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose bandwidth **WID/NAR**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.

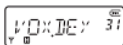


**NAR:** Narrow band 12.5KHz

**WID:** Width band 25KHz

### 9.30. VOXDEY: VOX Delay Time Settings

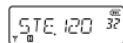
Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the thirty first menu item, the LCD will show "VOXDEY".



Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the time 1S/1.5S/2S/2.5S/3S. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.

### 9.31. STE: Squelch Tail Elimination Settings

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the thirty second menu item, the LCD will show "STE".



Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose squelch tail elimination mode **OFF/120/180**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.

**OFF:** Close this function.

**120:** Eliminate the 120° tail sound.

**180:** Eliminate the 180° tail sound.

### 9.32. DTMF: Dual Tone Multi-frequency Switch

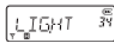
Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the thirty third menu item, the LCD will show "DTMF".



Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose squelch tail elimination mode **OFF/ON**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.

### 9.33. Light: The Background Light Color

Under the menu mode, press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose the thirty fourth menu item, the LCD will show "LIGHT".



Press  $\left[\text{ENT}\right]$  key to enter, then press  $\left[\uparrow\right]/\left[\downarrow\right]$  key to choose color **PURPLE/CYAN/WHITE/RED/GREEN/BLUE/ORANGE**. Press  $\left[\text{ENT}\right]$  key to confirm your choice and return to previous menu.

## 10. Other Auxiliary Functions

The follow functions are set by local dealers with PC programming. Please contact the local dealers.

### 10.1. Monitor Function

The squelch circuit on the transceiver mutes the speaker automatically, when no signals are present. So you will not hear background noise. Press and hold the Monitor key, to deactivate the squelch manually.

## Monitor Function Cont.

This is useful when you want to adjust the volume level, or when you need to hear a weak signal. The LED indicator lights green while the Monitor key is pressed.

## 10.2.Low Battery Alarm Function

Low battery alarms remind you the battery desired to be recharged. If press PTT key to transmit under low battery, the LCD show "BATTLO" and the transceiver utter "du" sounds.

The transceiver will utter "dudu" sounds under low battery, the battery capacity S-meter show blank.

## 11. Troubleshooting

Symptom	Possible Cause and Solvent
No power supply	The battery pack is depleted. Please replace or recharge the battery pack. The battery pack isn't installed correctly. Remove and re-install the battery pack.
The battery pack is depleted quickly, even though it just is recharged.	The life of battery pack is over, please replace it.
The transceiver can't communicate with others in others in your group	Please check and confirm your settings of frequency and CTCSS/DCS whether they are same as other users in your group. Other users far away from you. Please check and confirm your transceiver is within available range with others or not.
Hear the calls from other who are in different groups with you.	Please reset the CTCSS/DCS of all users transceiver in your group.
The transceiver tweet continually.	The current channel is on another frequency. Please choose other channels, or store a frequency into this channel.

## 12. Specification

Function	Range
Frequency range	136-174MHz,400-470MHz,
Channels	199
Channels Spacing	5/6.25/10/12.5/25KHz
Working Voltage	DC 7.4V±20%
Operating Temperature Range	-25 °C to + 55°C
Dimension (L×W×H)	114 x 57 x 38mm(Without antenna)
Weight 187.5g	(Without battery)
<b>Transmitter</b>	
Output Power	1W/4W
Modulation Mode	F3E/F2D
Clutter Radiation	≤7.5uW
Adjacent Channel Power	65dB
Frequency Deviation	≤5KHz/2.5KHz
Audio Distortion	≤5%
Frequency Stability	±2.5ppm
<b>Receiver</b>	
Sensitivity(12Db SINAD)	0.16uV
Modulation Receiver Bandwidth	±7KHz / ±3.5KHz
Adjacent Channels Selectivity	60dB
Intermediation	≥60dB
Squelch Response	≥60dB
SNR	≥60dB
Frequency Stability	±2.5ppm
Audio Output Distortion	500mW

### 13. CTCSS Table (Continuous Tone Coded Squelch System)

63.0	79.7	97.4	118.8	146.2	167.9	186.2	2065	241.8
67.0	82.5	100.0	123.0	151.4	171.3	189.9	210.7	250.3
69.3	85.4	103.5	127.3	156.7	173.8	192.8	218.1	254.1
71.9	88.5	107.2	131.8	159.8	177.3	196.6	225.7	
74.4	91.5	110.9	136.5	162.2	179.9	1995	229.1	
77.0	94.8	114.8	141.3	165.5	183.5	203.5	233.6	

### 14. DCS Table (Digital Coded Squelch)

017N/I	073N/I	165N/I	263N/I	365N/I	466N/I	654N/I
023N/I	074N/I	172N/I	265N/I	371N/I	503N/I	662N/I
025N/I	114N/I	174N/I	266N/I	411N/I	506N/I	664N/I
026N/I	115N/I	205 /I	271N/I	412N/I	516N/I	703N/I
031N/I	116N/I	212N/I	274N/I	413N/I	523N/I	712N/I
032N/I	122N/I	223N/I	306N/I	423N/I	526N/I	723N/I
036N/I	125N/I	225N/I	311N/I	431N/I	532N/I	731N/I
043N/I	131N/I	226N/I	315N/I	432N/I	546N/I	732N/I
047N/I	132N/I	243N/I	325N/I	445N/I	565N/I	734N/I
050N/I	134N/I	244N/I	331N/I	446N/I	606N/I	743N/I
051N/I	143N/I	245N/I	332N/I	452N/I	612N/I	754N/I
053N/I	145N/I	246N/I	343N/I	454N/I	624N/I	
054N/I	152N/I	251N/I	346N/I	455N/I	627N/I	
065N/I	155N/I	252N/I	351N/I	462N/I	631N/I	
071N/I	156N/I	255N/I	356N/I	464N/I	632N/I	
072N/I	162N/I	261N/I	364N/I	465N/I	645N/I	



---

## ***MAJOR TECH (PTY) LTD***

**South Africa**

🌐 [www.major-tech.com](http://www.major-tech.com)

✉ [sales@major-tech.com](mailto:sales@major-tech.com)

**Australia**

🌐 [www.majortech.com.au](http://www.majortech.com.au)

✉ [info@majortech.com.au](mailto:info@majortech.com.au)

