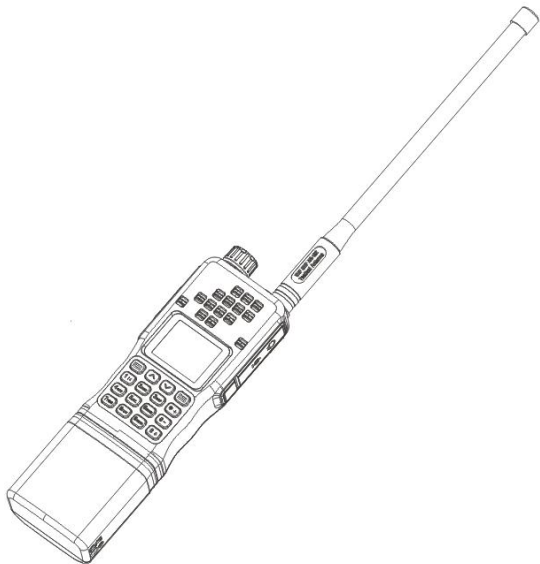




Amateur Radio

USER'S MANUAL

PREFACE

Thank you for purchasing our Amateur Radio. This easy-to-use radio will deliver you secure, instant and reliable communications at peak efficiency. Please read this manual carefully before use. The information presented here, it will help you to derive maximum performance from your radio.



WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.



ATTENTION! When programming the radio, start by reading the factory software data, and then rewrite this data with your frequency etc., to a new saved code plug, otherwise errors may occur. You can use the programming cable with a PC to program the authorized frequency, bandwidth, power, etc. your programming must comply with your FCC (or EU other country) license certification.



ATTENTION! Before using this product, read the RF Energy Exposure and Product Safety Guide that ship with the radio which contains instructions for safe usage and RF energy awareness and control for compliance with applicable standards and regulation.

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Chapter1. Getting Started

1.1 Regulations and Safety Warnings

■FCC Regulatory Conformance

FCC Statement:

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates and can radiate radio frequency energy. If not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. Verification of harmful interference by this equipment to radio or television reception can be determined by turning it off and then on. The user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

■ EU Regulatory Conformance

As certified by the qualified laboratory, the product is in compliance with the essential requirements and other relevant provisions of the Directive 2014/53/EU. All applicable EU regulations are regarded (2006/66/EC, 2011/65/EU, (EU)2015/863, 2012/19/EU).

NOTE: It can be operating under 2000m.

Please note that the above information is applicable to EU countries only.

Guidelines and Operating Instructions

To control your exposure and ensure compliance with the occupational/ controlled environmental exposure limits, always adhere to the following procedures.

Guidelines:

- Do not remove the RF Exposure Label from the device.
- User awareness instructions should accompany device when transferred to other users.
- Do not use this device if the operational requirements described herein are not met.

Operating Instructions:

- Transmit no more than the rated duty factor of 50% of the time. To transmit (talk), press the Push-to-Talk (PTT) key. To receive calls, release the [PTT] key. Transmitting 50% of the time, or less, is important because the radio generates

measurable RF energy only when transmitting (in terms of measuring for standards compliance).

- Keep the radio unit at least 2.5cm away from the face. Keeping the radio at the proper distance is important as RF exposure decreases with distance from the antenna. The antenna should be kept away from the face and eyes.
- When worn on the body, always place the radio in an approved holder, holster, case, or body harness or by use of the correct clip for this product. Use of non-approved accessories may result in exposure levels which exceed the FCC's occupational/ controlled environmental RF exposure limits.
- Use of non-approved antennas, batteries, and accessories causes the radio to exceed the FCC RF exposure guidelines.
- Contact your local dealer for the product's optional accessories.

■Precautions for Portable Terminals

Operating Prohibitions

To protect you against any property loss, bodily injury or even death, be sure to observe the following safety instructions:

1. Do not operate the product in a location containing fuels, chemicals, explosive atmospheres and other flammable or explosive materials. In such location, only an approved Ex-protection model is allowed for use, but any attempt to assemble or disassemble it is strictly prohibited.
2. Do not operate the product near or in any blasting area.
3. Do not operate the product near any medical or electronic equipment that is vulnerable to RF signals.
4. Do not hold the product while driving.
5. Do not operate the product in any area where use of wireless communication equipment is completely prohibited.

Important Tips

To help you make better use of the product, be sure to observe the following instructions:

1. Do not use any unauthorized or damaged accessory.
2. Keep the product at least 2.5 centimeters away from your body during transmission.
3. Do not keep the product receiving at high volume for a long time.

4. For vehicles with an air bag, do not place the product in the area over the air bag or in the air bag deployment area.
5. Keep the product and its accessories out of reach of children and pets.
6. Please operate the product within the specified temperature range.
7. Continuous transmission for a long time may lead to heat accumulation within the product. In this case, please keep it at a proper location for cooling.
8. Handle the product with care.
9. Do not disassemble, modify or repair the product and its accessories without authorization.

■Precautions for Batteries

Charging Prohibitions

To protect you against any property loss, bodily injury or even death, be sure to observe the following safety instructions:

1. Do not charge or replace your battery in a location containing fuels, chemicals, explosive atmospheres and other flammable or explosive materials.
2. Do not charge your battery that is wet. Please dry it with a soft and clean cloth prior to charge.
3. Do not charge your battery suffering deformation, leakage and overheat.
4. Do not charge your battery with an unauthorized charger.
5. Do not charge your battery in a location where strong radiation is present.
6. Overcharge shall always be prohibited for it may shorten the life of your battery.

Maintenance Instructions

To help your battery work normally or prolong its life, be sure to observe the following instructions:

1. Accumulated dust on charging connector may affect normal charging. Please use a clean and dry cloth to wipe it on a regular basis.
2. It is recommended to charge the battery under 5℃~40℃. Violation of the said limit may cause battery life reduction or even battery leakage.

3. To charge a battery attached to the product, turn it off to ensure a full charge.
4. Do not remove the battery or unplug the power cord during charging to ensure a smooth charging process.
5. Do not dispose of the battery in fire.
6. Do not expose the battery to direct sunlight for a long time nor place it close to other heating sources.
7. Do not squeeze and penetrate the battery, nor remove its housing.

Transportation Instructions

1. Damaged batteries must not be transported.
2. To avoid short circuit, separate the battery from metal parts or from each other if two or more batteries are transported in one packaging.
3. The radio must be switched off and secured against switch-on, if the battery is attached.

The content of the shipment must be declared in the shipping documents and by a Battery Shipping Label on the packaging. Contact your hauler for the local regulations and further information.

1.2 Content of the packaging

- 1 x Transceiver
- 1 x adapter (Output DC10V)
- 1 x User Manual
- 1 x Li-Ion battery pack
- 1 x Antenna

If any item is missing, please verify with your dealer.

1.3 Product Highlights

- 7.4V large capacity battery continues to provide you with communication protection
- 1.77" large LCD screen, wider viewing angle
- 250mm high sense of lengthening the antenna, the communication distance wider coverage
- DC10V direct charge port, battery life more convenient
- 40mm large-caliber speakers, the sound loud and clear fidelity

- High power, open to the transmission farther; complex environment, more penetrating power

1.4 Main features

- Large screen, full keyboard, opens menu operation
- Voice prompts and screen displays combine to get rid of the shackles of Programming Software
- Large capacity, high energy battery for continuous endurance
- DC direct charging design, more convenient battery life
- Dual standby, dual watch, dual display
- Up to 128 memory channels
- 50 CTCSS tones and 210 DCS codes
- SOS Emergency function
- FM radio receiver (76 - 108MHz)
- Channel spacing: 25 KHz/12.5KHz
- TOT (Time out timer)
- Reverse function
- CTCSS and DCS codes research
- Busy Channel Lockout function (BCL)
- Frequency step: 2.5/5/6.25/10/12.5/25KHz
- Repeater shift
- Keypad lock
- 2 pin Kenwood accessory jack
- VOICE: vocal indication of the function selected
- 1750Hz tone for repeaters
- LCD display with backlight adjustable in 3 colors
- VOX, Scan, Dual Watch functions
- Channel or frequency mode selection
- DTMF function
- Alarm function
- Setting and storing of channel names
- High/low power selection
- Frequency offset (adjustable): 0-69.990MHz
- Squelch adjustable in 9 levels
- Power Save

Chapter2. Battery Information

2.1 Charging the Battery Pack

The Li-ion battery pack is not charged at the factory; please charge it before use. Charging the battery pack for the first time after purchase or extended storage (more than 2 months) may not bring the battery pack to its normal maximum operating capacity. Best operation will require fully charging/ discharging the battery two or three times before the operating capacity will reach its best performance. The battery pack life may be depleted when it's operating time decreases even though it has been fully and correctly charged. If this is the case, replace the battery pack.

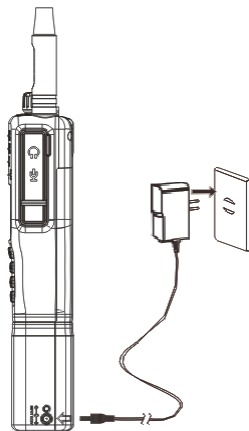
2.2 Charger Supplied

Please use the specified charger provided by us. Other models may cause explosion and personal injury. After installing the battery pack, and if the radio displays low battery with a voice prompt, please charge the battery.

2.3 How to Charge

- Plug the AC adaptor into the AC outlet, and then plug the cable of the AC adapter into the DC jack located on the side of the battery.
- It takes approximately 2-5 hours to fully charge the battery. When the lamp lights green, the charging is completed. Remove the battery or the radio unit with its battery from socket.

WARNING!



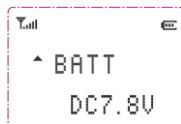
When charging a radio (with battery) the indicating lamp will not turn into green to show the fully charged status if the radio is powered on. Only when the radio is switched off will the lamp indicate normal operation. The radio consumes energy when it is power-on, and the charger cannot detect the correct battery voltage when the battery has been fully charged. So the charger will charge the battery in constant voltage mode and fail to indicate correctly when the battery has been fully charged.

2.4 LED Indicator

STATUS	LED
Charge Normally	Red
Fully Charged	Green

NOTE: Trouble means battery too warm, battery short-circuited or charger short-circuited.

Note: You can hold down the [OSQL] key to get the battery voltage information, the screen will display "BATT 7.8V" (for example, 7.8V voltage).



Chapter3. Installation of Accessories

Before the radio is ready for use we need to attach the battery pack, as well as charge the battery.

3.1 Installing/ Removing the Antenna

- Installing the Antenna: Screw the antenna into the connector on the top of the transceiver by holding the antenna at its base and turning it clockwise until secure.
- Removing the Antenna: Turn the antenna counter-clockwise to remove it.



3.2 Installing the battery pack

Before attaching or removing the battery make sure your radio is turned off by turning the power/volume knob all the way counter-clockwise.

To install the battery pack:

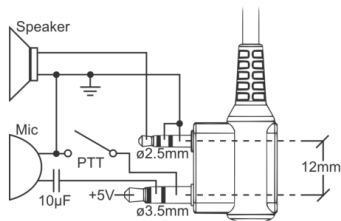
- With the back of the radio facing you, insert the bottom part of the Li-ion battery pack to the bottom of the radio.
- Push down the Li-ion battery pack into the radio until the Battery Lock Tab locks into place.

To remove the battery pack:

- Press the Battery Lock Tab downward until the Li-ion battery pack unlocks from the radio.
- Pull the Li-ion battery pack away from the radio.

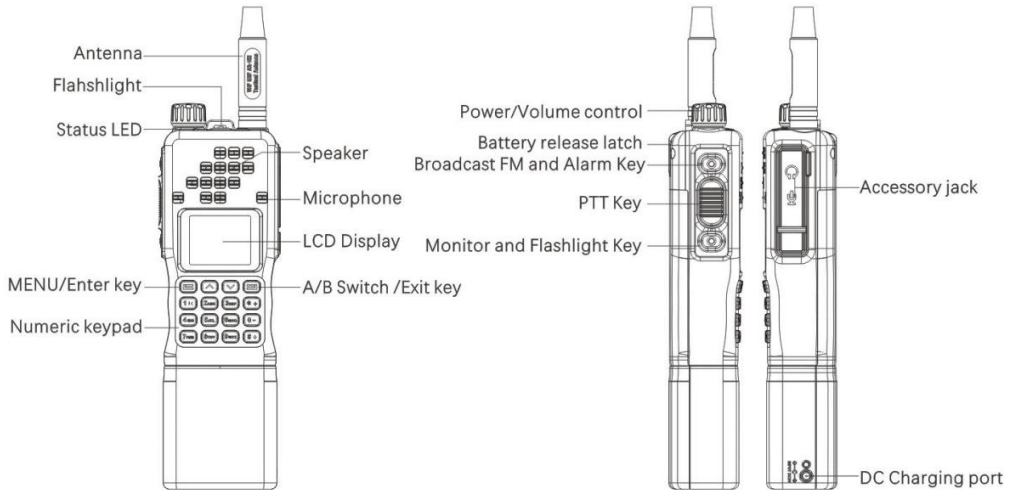
3.3 Installing the Additional Speaker/Microphone (Optional)

Pry open the rubber MIC-Headset jack cover and then insert the Speaker / Microphone plug into the double jack.

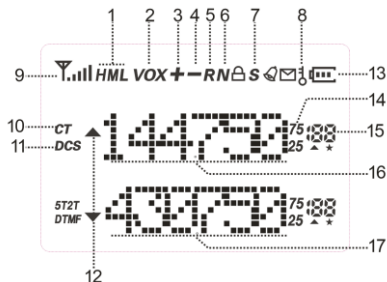


Chapter4. Radio Overview

4.1 Buttons and controls of the radio



4.2 The main display



LCD icon summary

1. Transmit power level indicator. According to Power (High, Mid, Low)	10. CTCSS enabled
2. VOX enabled	11. DCS enabled
3. Frequency shift direction if enabled in VFO or MR mode, TX will be shifted higher in frequency than RX	12. Indicates active band or channel
4. Frequency shift direction if enabled in VFO or MR mode, TX will be shifted lower in frequency than RX	13. Battery Level Indicator
5. Reverse function enabled	14. Least significant modifiers.
6. Narrowband enabled	15. Memory channel
7. Dual watch enabled	16. A band operating frequency
8. Keypad lock enabled	17. B band operating frequency
9. Squelch Open/ Close Indicator	

Battery Level Indicator

When the battery level indicator reads  the battery is depleted. At this point the radio will start beeping periodically as well as flash the backlight of the display and when voice prompts are enabled, a "Low Voltage" announcement will be heard, indicating that you need to change your battery or put your radio in the charger.

4.3 Status Indications

The status LED has a very simple and traditional design.

LED Indicator	Radio Status
Constant Red	Transmitting.
Constant Green	Receiving.

4.4 Main keypad controls

- **[SOS] key:** Press it for a long time you will activate the alarm function. Press it again to turn off this feature.
- **[FM] key:** Press it for a short time to turn on the FM radio. Press it again to turn it off.
- **[LAMP/MONI] key:** Press it for a short time to light up the flashlight. If you push this button again, the flashlight will light up to strobe mode. Press **[LAMP/MONI]** a third time to turn off the flashlight.

To activate the Monitor function presses the button for a long time.

- **[MENU] key:** It is used for activating the MENU, choose each MENU selection and confirm the parameter.

In the off state, press and hold this key allowing switching between frequency (VFO) mode or memory (MR) mode.

To save frequencies to channel memory you must be in Frequency (VFO) mode. Memory mode is sometimes also referred to as Channel mode.

- **[▲] key:** Press it for more than 2 seconds, the channel and frequency will move upwards rapidly; in SCAN mode, press this control to move the scanning upwards.
- **[▼] key:** Keep it pressed it for more than 2 seconds, the channel and frequency will move downwards rapidly; in SCAN

mode, press this control to move the scanning downwards.

- **[EXIT]** key: press to exit the Menu and functions. A/B (appears on the display): push to select the desired frequency (VHF or UHF) in the main or secondary display. When listening to broadcast FM, the **[EXIT]** key switches between 65-75 MHz and 76-108 MHz band.

- **Numeric keypad**

With these keys you can input the information or your selections on the radio. In tx mode, push the number keys to send a corresponding DTMF code.



A	B	C	D
1	2	3	*
4	5	6	0
7	8	9	#

- ***SCAN Key**

A short momentary press of the key enables the reverse function.

When listening to broadcast FM a momentary press will start the scanning. Scanning in broadcast FM will stop as soon as an active station is found, regardless of scanner resume method.

To enable the scanner, press and hold the **[*SCAN]** key for about two seconds.

- **Zero 0 Key**

It features a battery voltage meter that the current voltage of the battery on the display.

To see the voltage displayed, press and hold the **[0SQL]** key for about two seconds.

- **#PTO key**

If you press shortly **[#PTO]** you will switch to High /Middle /Low output power.

If you press this button for more than 2 seconds you will lock/unlock the keypad.

Chapter5. Basic Operations

5.1 Power on the radio

- **Turning the unit on**

To turn the unit on, simply rotate the **Volume/Power** knob clockwise until you hear a "click". If your radio powers on correctly there should be an audible double beep after about one second and the display will show a message or flash the LCD depending on settings for about one second. Then it will display a frequency or channel. If the Voice prompt is enabled, the voice will announce "frequency mode" or "channel mode".

- **Turning the unit off**

Turn the **volume/power** knob counter-clock wise all the way until you hear a "click". The unit is now off.

5.2 Adjusting the volume

To turn up the volume, turn the volume/power knob clock-wise. To turn the volume down, turn the **volume/power** knob counter-clock-wise. Be careful not to turn it too far, as you may inadvertently turn your radio off.

5.3 Making a call

NOTE: Press the [Back] key to switch the main channel to the other channel if there are 2 channels shown on the display. In standby mode, press and hold the [MENU] key to switch between frequency (VFO) mode and channel (MR) mode.

- Channel mode call: After selecting a channel, hold down the [PTT] key to initiate a call to the current channel. Speak into the microphone with normal tone. Initiate a call, the red LED is on.
- Frequency mode call: The off state, hold press [MENU] key to open the radio, switching to the frequency mode, the frequency range allowed entering, press the [PTT] key, a call to the current channel. Speak into the microphone with normal tone. Initiate a call, the red LED is on.
- Receive a call: When you release the [PTT] key, you can answer it without any action.
When receiving a call, the green LED is on.

NOTE: To ensure the best reception volume, keep the distance between the microphone and the mouth at the time of transmission from 2.5 cm to 5 cm.

5.4 Channel selection

There are two modes of operation: Frequency (VFO) mode, and Channel or Memory (MR) mode.

For everyday use, Channel (MR) mode is going to be a whole lot more practical than Frequency (VFO) mode. However, Frequency (VFO) mode is very handy for experimentation out in the field. Frequency (VFO) mode is also used for programming channels into memory.

In Channel (MR) mode you can navigate up and down the channel by using the ▲ and ▼ keys.

Ultimately which mode you end up using will depend entirely on your use case.

5.5 Frequency (VFO) mode

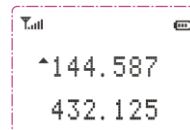
In Frequency (VFO) mode you can navigate up and down the band by using the ▲ and ▼ keys. Each press will increment or decrement your frequency according to the frequency step you've set your transceiver to.

You can also input frequencies directly on your numeric keypad with kilohertz accuracy.

The following example assumes the use of a 12.5 kHz frequency step.

Example. Entering the frequency 144.5870 MHz on display A

- a. In standby mode, press and hold the **[MENU]** key to switch to the frequency (VFO) mode.
- b. Press **[EXIT]** until the ▲ icon appears next to the upper display. .
- c. Enter **[1][4][4][5][8][7][0]** on the numeric keypad.



WARNING!

Just because you can program in a channel does not mean you're automatically authorized to use that frequency.

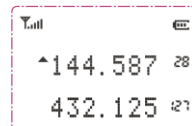
Transmitting on frequencies you're not authorized to operate on is illegal, and in most jurisdictions a serious offence. If you get caught transmitting without a license you can and will get fined, and in worst case sent to jail. However, it is legal in most

jurisdictions to listen. Contact your local regulatory body for further information on what laws, rules and regulations apply to your area.

5.6 Channel (MR) mode

The use of Channel (MR) mode is dependent on actually having programmed in some channels to use.

Once you have channels programmed and ready, you can use the ▲ and ▼ keys to navigate between channels.



Chapter6. Advanced Features

6.1 Frequency scanning

This function can scan the frequency.

- a. In frequency mode, press **[*SCAN]** key for more than 2 seconds. The radio will start scanning the frequency according to the set frequency step.
- b. You can change the scanning direction with the ▲ and ▼ keys.
- c. Press any key to stop the scanning.

Note: for Scan mode, see Menu No.18.

6.2 Channel scanning

This function can scan the channels.

- a. In channels mode, press **[*SCAN]** key for more than 2 seconds. The radio will start scanning according to the channel you set.
- b. You can change the scanning direction with the ▲ and ▼ keys.

c. Press any key to stop scanning.

Note: for Scan mode, see Menu No.18.

6.3 Search CTCSS/DCS Code

With this function you can search and store the CTCSS/DCS code used by other radios.

Procedure:

a. In frequency mode press **[MENU]+[1][1]**.

b. Press **[MENU]** key again.

c. Press **[*SCAN]** key; CT will blink on the display.

d. When another radio is transmitting, the display will show the CTCSS/DCS code.

e. After searching the CTCSS code, the radio will beep and stop scanning.

f. After setting, press **[MENU]** key for confirmation and store, or press **[PTT]** or **[EXIT]** key to return to standby mode.

NOTE 1: The DCS scanning has the same procedure of CTCSS code, but you have to select MENU+10 to enter scanning.

NOTE 2: If CTCSS has not searched the code, you can search using the DCS mode.

6.4 Cursor ▼ ▲ Conversion (A/B)

Directly press **[EXIT]** key to move the cursor up and down. Then, you can modify or confirm the parameters indicated by the cursor.

Important1: it has a dual-frequency display function. In frequency mode, you will see on the display two different receiving and transmitting frequencies; while in channel mode the two different channels will be displayed.

Important2: In frequency or channel mode, press the **[EXIT]** key to shift between the main channel A and the sub-channel B

▲ on the display indicates on which channel (main channel A or sub channel B) you are operating.

▼ is displayed next to the channel.

6.5 High/Middle/Low power fast selection

In channel mode, press [#**MO**] key to shift between high/ middle/ low power.

6.6 Keypad lock

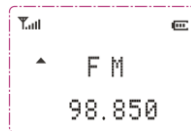
This function locks the keypad to prevent accidental pressure of the controls.

To unlock the keypad, press [#**MO**] for more than 2 seconds.

6.7 FM Radio (FM)

The frequency range to listen to the radio is 76 -108MHz. When listening to broadcast FM, press [EXIT] key switches to 76-108 MHz band. United States FM radio frequency range 88-108MHz. The EU is 87.5-108MHz frequency range.

- In frequency or channel mode, Press [FM] to turn on the radio.
- Select the desired radio frequency with the ▲ or ▼ keys or input the frequency. Or
 - Press [* SCAN] to automatically search a radio station.
- Press [FM] to exit FM radio.



Note: while you are listening to the radio, the frequency or channel of A / B receiving signal will automatically switch to the frequency or channel mode for normal transmitting and receiving.

When the signal disappears the radio will automatically switch again to FM radio mode.

6.8 Flashlight

This function is very useful for night illumination.

To turn it on press [LAMP/MONI]; push it again, the flash light will be strobe; push it again: it will turn off.

6.9 TX 1000Hz, 1450Hz, 1750Hz, 2100Hz repeaters tone

Press [PTT] + [SOS] to send 1750Hz repeaters tone. This function is useful for communications through repeaters.

If you have the keypad lock enabled on your radio, you can still send a 1750Hz tone the regular way without having to unlock your radio.

6.10 Manual Programming (Channels Memory)

Memory channels are an easy way to store commonly used frequencies so that they can easily be retrieved at a later date. It features 128 memory channels that each can hold: Receive and transmit frequencies, transmit power, group signaling information, bandwidth, ANI/ PTT-ID settings and a six character alphanumeric identifier or channel name¹.

Frequency Mode vs. Channel Mode

In standby mode, press and hold the [MENU] key to switch between frequency (VFO) mode and channel (MR) mode.

These two modes have different functions and are often confused.

Frequency Mode (VFO) : Used for a temporary frequency assignment, such as a test frequency or quick field programming if permitted.

Channel Mode (MR) : Used for selecting preprogrammed channels.

Ex 1. Programming a Channel Repeater Offset with CTCSS Tone

EXAMPLE New memory in Channel 10:

RX = 432.000 MHz

TX = 437.000 MHz (This is a (+ 5) Offset)

TX CTCSS tone 123.0

- a. Press the **[Back]** button to switch between menus.
- b. Press and hold the **[MENU]** key to set the radio to VFO mode, and the channel number on the right will disappear.
- c. **[MENU] [2][8] [MENU] [1] [0] [MENU] [EXIT]** Deletes Prior Data in channel (Ex. 10)
- d. **[MENU] [1][3] [MENU] 123.0 [MENU] [EXIT]** Selects desired TX encode tone
- e. Enter RX frequency (Ex. **432000**)
- f. **[MENU] [2][7] [MENU] [1][0] [MENU]** Enter the desired channel (Ex 10)

-->>[EXIT]

RX has been added

g. Enter TX frequency (Ex. **437000**)

h. [MENU] [2][7] [MENU] [1][0] [MENU]

Enter the same channel (Ex 10)

-->> [EXIT]

TX has been added

i. Press and hold the [MENU] key to return to the MR mode and the channel number will reappear.

Ex 2. Programming a Simplex Channel with CTCSS tone

EXAMPLE New memory in Channel 10:

RX = **436000** MHz

TX CTCSS tone 123.0

a. Press the [Back] button to switch between menus.

b. Press and hold the [MENU] key to set the radio to VFO mode, and the channel number on the right will disappear.

c. [MENU] [2][8][MENU] [1] [0] [MENU] [EXIT]

Deletes Prior Data in channel (Ex. 10)

d. [MENU] [1][3] [MENU] 123.0 [MENU] [EXIT]

Select desired TX encode tone (Ex 123 CTCSS)

-->>Use [EXIT] to select Upper display

e. Enter RX frequency (Ex. **436000**)

f. [MENU] [2][7] [MENU] [1][0] [MENU]

Enter the desired channel (Ex 10)

-->> [EXIT]

Channel has been added

g. Press and hold the [MENU] key to return to the MR mode and the channel number will reappear.

6.11 Repeaters Programming

The following instructions assume that you know what transmit and receive frequencies your repeater employs, and that you're authorized to use it.

a. Press and hold the [MENU] key to set the radio to VFO mode, and the channel number on the right will disappear.

b. Use the numeric keypad to enter the repeater's output (your receiving) frequency.

c. Press the [MENU] key to enter the menu.

- d. Enter **[2][6]** on the numeric keypad to get to frequency offset.
- e. Press **[MENU]** key to select.
- f. Use the numerical keypad to enter the specified frequency offset. See the section called “26 OFFSET - Frequency shift amount” for details.
- g. Press **[MENU]** to confirm and save.
- h. Enter **[2][5]** on the numeric keypad to get to offset direction.
- i. Use the **▲/▼** keys to select + (positive) or - (negative) offset.
- j. Press **[MENU]** to confirm and save.
- k. Optional:
 - a). Save to memory, see the section called “Manual programming” for details.
 - b). Set up CTCSS; see the section called “CTCSS” for details.
- l. Press **[EXIT]** to exit the menu. If everything went well, you should be able to make a test call through the repeater.

NOTE:

If you're experiencing problems making a connection to the repeater, check your settings and/or go through the procedure again.

Certain Amateur Radio repeaters (especially in Europe) use a 1750Hz tone burst to open up the repeater. To see how this is done with the radio, see the section called “1750Hz Tone-burst”.

If you're still unable to make a connection, contact the person in charge of the radio system with your employer or your local amateur radio club, as the case may be.

If you for some reason want to listen to the repeater's input frequency instead, press **[*SCAN]** key momentarily and you'll reverse your transmit and receive frequencies.

This is indicated in the LCD on the radio with an R in the top row, next to the + and - for the offset direction.

Chapter7. Working the MENU System

For a complete reference on available menu items and parameters, see **Appendix C, Shortcut Menu operations**.

Note: in channel mode, the setting of these features is not possible: CTCSS/ DCS tones, wide/narrow bandwidth, PTT-ID, Busy channel lock out, channel name edit.

7.1 Basic use

Using the menu with arrow keys

- a. Press the **[MENU]** key to enter the menu.
- b. Use the **[▲]** and **[▼]** keys to navigate between menu items.
- c. Once you find the desired menu item, press **[MENU]** again to select that menu item.
- d. Use the **[▲]** and **[▼]** keys to select the desired parameter.
- e. When you've selected the parameter you want to set for a given menu item;
 - a). To confirm your selection, press **[MENU]** and it will save your setting and bring you back to the main menu.
 - b). To cancel your changes, press **[EXIT]** and it will reset that menu item and bring you out of the menu entirely.
- f. To exit out of the menu at any time, press the **[EXIT]** key.

7.2 Using short-cuts

As you may have noticed if you looked at **Appendix C, Shortcut Menu operations**, every menu item has a numerical value associated with it. These numbers can be used for direct access of any given menu item.

The parameters also have a number associated with them, see **Appendix C, Shortcut Menu operations** for details.

Using the menu with short-cuts

- a. Press the **[MENU]** key to enter the menu.
- b. Use the numerical keypad to enter the number of the menu item.
- c. To enter the menu item, press the **[MENU]** key.

- d. For entering the desired parameter you have two options:
 - a). Use the arrow keys as we did in the previous section; or
 - b). Use the numerical keypad to enter the numerical short-cut code.
- e. And just as in the previous section;
 - a). To confirm your selection, press **[MENU]** and it will save your setting and bring you back to the main menu.
 - b). To cancel your changes, press **[EXIT]** and it will reset that menu item and bring you out of the menu entirely.
- f. To exit out of the menu at any time, press the **[EXIT]** key.
- g. All further examples and procedures in this manual will use the numerical menu short- cuts.

7.3 Functions and operations

(1) Squelch level (SQL) - MENU No.0

Thanks to this function you can adjust the squelch in 10 different levels:

- **level 0:** opened squelch. With this setting, it will detect all signals, also the weakest ones, but will also receive the background noise or undesired signals.
- **levels 1- 9:** level 1 (lowest squelch level), level 9 (highest squelch level).

If the squelch is set to the highest level, the radio will receive the strongest signals only.

(2) Step frequency (STEP) - MENU No.1

This function lets you select the desired frequency step.

The selectable steps are the following: 2.5/5.0/6.25/10.0/12.5/20.0/25.0/50.0 KHz

Note: in channel mode, this function cannot be modified.

(3) Output power (TXP) - MENU No.2

In this MENU you can select the high/low output power.

Note: select the output power can improve the quality of the call, while the low output power can reduce the radiation and the battery capacity loss. Press the fast key “#PTO” to switch between the high or low output powers.

(4) Battery save (SAVE) - MENU No.3

The power save feature enables a reduction in the consumption of the battery when the radio is in standby.

You have 5 selections available: OFF / 1:1 / 1:2 / 1:3 / 1:4.

For example: 1:1 = 1s' working and 1s' battery saving. 1:2 = 1s' working and 2s' battery saving.

(5) VOX Function (VOX) - MENU No.4

This function allows hands-free conversations: just speak in the direction of the microphone and the communication will be automatically activated.

You can choose 11 levels: OFF-10. 1 is the highest level, 10 is the lowest one.

Note: the higher is the level, the higher is the microphone sensitivity. The VOX function cannot be modified in SCAN and FM radio mode.

(6) Wide/Narrow bandwidth (WN) - MENU No.5

This function is used to set the working bandwidth of the radio.

You can choose between wide or narrow bandwidth.

WIDE: 25KHz, NARROW: 12.5KHz

Note: In channel mode, this function cannot be modified.

(7) Backlight (ABR) - MENU No. 6

With this function you can adjust the auto off time of the display backlight (1-5s).

Note: we suggest you setting 4-5s levels.

(8) Dual Watch Operation (TDR) - MENU No. 7

When this function is activated, you can receive the frequency of channel A and channel B at the same time.

If a signal is detected, the ▼/▲ pointer will blink on the corresponding channel or frequency.

Note: In Dual Watch operation mode, you can change the parameter of AB channel or frequency freely.

(9) Keypad beep (BEEP) - MENU No. 8

When this function is enabled, every time a button is pressed, you will hear a beep tone.

(10) Time-Out-Timer (TOT) - MENU No.9

The TOT function is used to prevent a too long transmission and limits the tx time: TOT temporarily stops the transmission if the radio has been used beyond the max pre-set time (for example 15s, 30s, 45s, etc).

(11) Receiving DCS (R-DCS) - MENU No.10

DCS codes are similar to access codes and can be added to channels, so as to create a sort of personal channel. They enable the radio to communicate with the users that are tuned on the same channel and have set the same DCS code.

You can choose amongst:

- **OFF:** OFF
- **R-DCS:** D023N-D754N (Normal DCS)
- **R-DCS:** D023I-D754I (Inverse DCS)

Note: There are 208 groups of normal and inverse DCS codes. This function cannot be amended in channel mode.

(12) Receiving CTCSS (R-CTCSS) - MENU No.11

As DCS codes, the CTCSS codes can be added to the channels for creating new private channels.

Note: there are 50 groups of CTCSS tones. In channel mode the CTCSS tones cannot be changed.

(13) Transmitting DCS - (T-DCS) - MENU No.12

In this Menu you activate DCS codes in tx mode. You can choose between normal R-DCS (D023N-D754N) and inverted R-DCS

(D023I-D754I)

Note: the groups of DCS codes are 208. DCS codes cannot be changed in channel mode.

(14) Transmitting CTCSS (T-CTCSS) - MENU No.13

In this Menu you can set a CTCSS tone in tx mode.

You can choose: OFF or CTCSS (67.0 to 254.1 Hz)

Note: there are 50 groups of CTCSS tones. In channel mode the CTCSS tones cannot be changed.

(15) Voice function (VOICE) - MENU No. 14

With this function, you activate a voice that informs you about any operation/ selection you are doing.

(16) ANI-ID (ANI-ID) - MENU No.15

With this function you can set your ID-code. It can be programmed by the proper programming software. You can edit up to 5 digits.

(17) DTMFST (DTMFST) - MENU No.16

Determines when DTMF Side Tones can be heard from the transceiver speaker.

(18) Signal code (S-CODE) - MENU No.17

Selects 1 of 15 DTMF codes. The DTMF codes are programmed with software and are up to 5 digits each.

(19) SCAN Resume Mode (SC-REV) - MENU No.18

Thanks to this function, it can SCAN in frequency or channel mode. You can choose amongst three options:

TO: Time-operated SCAN

Whenever a signal is detected, the radio will suspend the SCAN for 5 seconds, and then will continue to SCAN even if the signal is still present.

CO: Carrier-operated SCAN

Whenever a signal is detected, the radio will stop scanning. It will resume to SCAN once the signal will disappear.

SE: Search SCAN

The radio will stop scanning once a signal is detected.

(20) PTT-ID (PTT-ID) - MENU No.19

With this function you can decide when sending the ANI-ID code in tx mode.

You can choose amongst 4 possibilities.

- **OFF:** press PTT to turn it off
- **BOT:** the code is sent when you press the PTT
- **EOT:** the code is sent when the PTT is released
- **BOTH:** the code is sent when you press and release the PTT

Note: select 'OFF' when using in case of affecting the radio.

(21) PTT ID delay (PTT-LT) - MENU No.20

In this MENU you can set the delay time (0-30ms) sending the PTT-ID.

Note: select '0' in normal using.

(22) Channel A Display Mode (MDF-A) - MENU No.21

This function is used to set the display mode of channel A.

Display modes:

- **FREQ.:** Frequency + channel No.
- **CH:** Channel number
- **NAME:** Channel name

Note: Channel name mode must be set by the programming software. Up to three numbers or characters can be edited.

(23) Channel B Display Mode (MDF-B) - MENU No.22

This function is used to set the display mode of channel B.

Display modes:

- **FREQ.:** Frequency + channel No.
- **CH:** Channel number
- **NAME:** Channel name

Note: Channel name mode must be set by the programming software. Up to three numbers or characters can be edited.

(24) Busy Channel Lock (BCL) - MENU No. 23

When this function is on, it may prevent other radios' interference. If the selected channel is being used by other radios, when you press key PTT, your radio cannot transmit.

Release the PTT and transmit as soon as the frequency is no longer busy.

(25) Auto Keypad Lock (AUTOLK) - MENU No.24

When this feature is activated, the keypad will be automatically locked after 15s; this prevents accidental pressure of any keys.

(26) Frequency offset direction (SFT-D) - MENU No.25

Using this function, you can set the direction of the frequency offset in RX and TX.

You have the following options:

- +: Positive offset;**
- : Negative offset;**
- OFF: no offset**

Note: you should set different frequency deviation according to the repeaters selected. This function is not enabled in channel mode.

(27) Frequency offset (OFFSET) - MENU No. 26

In this MENU you can set the deviation between tx and rx. The frequency offset of this radio is 0-69.990MHz.

(28) Channel store - (MEM-CH) - MENU No. 27

When the radio is in frequency working mode or standby mode, input the desired frequency or parameters directly.

To set a CTCSS tone or a DCS code in TX or RX on the stored channel, refer to paragraphs MENU 10-13

Note: You cannot overwrite a stored channel; you have to delete it first. See following paragraph No.28.

(29) Channel Delete (DEL-CH) - MENU No.28

In this menu you can delete a channel of the radio.

(30) Standby backlight (WT-LED) - MENU No.29

In this MENU you can choose the color of the backlight when the radio is in standby mode.

You can choose amongst:

- **OFF** (backlight off)
- **BLUE**
- **PURPLE**
- **ORANGE**

(31) RX backlight (RX-LED) - MENU No. 30

In this MENU you can choose the backlight color when the radio is receiving.

You can choose amongst:

- **OFF** (backlight off)
- **BLUE**
- **PURPLE**
- **ORANGE**

(32) TX backlight (TX-LED) - MENU No.31

You can choose the backlight color when the radio is transmitting.

Available colors:

- **OFF** (backlight off)
- **BLUE**
- **PURPLE**
- **ORANGE**

(33) Alarm Mode (AL-MOD) - MENU No.32

This function can set the tone alarm/code alarm/site alarm of the radio.

Keep pressed the **[CALL]** key for 3 seconds to start the alarm tone.

The following three options can be selected:

- **SITE:** the speaker emits an alarm tone but the radio doesn't transmit;
- **TONE:** the speaker emits an alarm tone and the radio transmits it;
- **CODE:** the speaker emits an alarm tone and the radio transmits it followed by ANI-ID code.

(35) Dual Watch (TDR-AB) - Menu No.34

When this function is on, you may receive signals of A/B channel or frequency. It can also be used for cross band receiving and transmitting. You can choose amongst the following settings:

OFF: it can receive in both VFO (not simultaneously); ▲ or ▼ will blink on the transmitting frequency band.

A: the radio can receive in both VFO (not simultaneously) but can transmit in VFO A only.

B: The radio can receive in both VFO (not simultaneously) but can transmit in VFO B only.

If you choose option A, it means that 432.5875MHz is the tx frequency band, while 145.550MHz is the rx frequency band; the upper VFO shows 432.5875 MHz while in the lower VFO 145.550MHz will be displayed; you can receive on both 432.5875 MHz and 145.550 MHz, but can transmit on 432.5875 MHz only.

While if you choose option B, 145.550MHz is the tx frequency band and 432.5875MHz is the rx frequency band. In the upper VFO 432.5875 MHz will be displayed while the lower VFO will show 145.550 MHz; you can receive on both 432.5875 MHz and 145.550 MHz, but transmit on 145.550 MHz only. Example: the LCD displays



(36) Side tone elimination (STE) - Menu No. 35

This feature is helpful to eliminate the annoying audio tone after the transmission is finished (end transmission noise muffler).

(37) Side tone elimination in communication through repeater (RP-STE) - Menu No. 36

This function is used when the radio operates through a repeater; when the PTT is released, the repeater will emit the end transmission tone to confirm it is working.

Available settings:

OFF 1,2,3,4,5,.....10 to set the delay time.

Note: Please disable this function in normal using, lest affect your normal conversation.

(38) Delay time of side tone elimination in communication through repeater (RPT-RL) - Menu No.37

With this function you have the confirmation that the repeater has transferred the signal. You can choose amongst: OFF 1,2,3,4,5,.....10 to set the delay time.

(39) Display mode at the turning on (PONMSG) Menu No.38

With this function you can set the display mode when the radio is turned on. Available options:

- **FULL:** full frequency character is displayed.
- **MSG:** Model is displayed.

(40) Roger beep (ROGER) - Menu No. 39

When the PTT is released, the radio will beep to confirm to other users that you have finished your transmission and that they can start talking.

(41) Reset (RESET) - Menu No.40

With this function you can reset the transceiver to the factory-programmed settings and parameters. After that, you can set the desired functions.

There are two types of reset:

- **VFO:** Menu Reset
- **ALL:** Menu and channel Reset

(42) R-TONE (Repeater Tone)- Menu No.41

1000Hz/1450Hz/1750Hz/2100Hz

***To send out a repeater tone; You hold down the [PTT] + [SOS] key.**

Chapter 8. Maintenance

Your Two Way Radio is an electronic product of exact design and should be treated with care.

The suggestions below will help you to fulfill any warranty obligations and to enjoy this product for many years.

- Do not attempt to open the radio for any reason! The radio's precision mechanics and electronics require experience and specialized equipment; for the same reason, the radio should under no circumstances be realigned as it has already been calibrated for maximum performance. Unauthorized opening of the transceiver will void the warranty.
- Do not store the Radio under the sunshine or in hot areas.
- High temperatures can shorten the life of electronic devices, and warp or melt certain plastics.
- Do not store the radio in dusty and dirty areas.
- Keep the Radio dry. Rainwater or damp will corrode electronic circuits.
- If it appears that the Radio diffuses peculiar smell or smoke, please shut off its power immediately and take off the charger or battery from the radio.
- Do not transmit without antenna.

Appendix A. – Trouble shooting guide

Phenomena	Analysis	Solution
You cannot turn on the radio.	The battery may be installed improperly.	Remove and reattach the battery.
	The battery power may run out.	Recharge or replace the battery.
	The battery may suffer from poor contact caused by dirty or damaged battery contacts.	Clean the battery contacts or replace the battery.
During receiving, the voice is weak or intermittent.	The battery voltage maybe low.	Recharge or replace the battery.
	The volume level may be low.	Increase the volume.
	The antenna maybe loose or maybe installed incorrectly.	Turnoff the radio, and then remove and reattach the antenna.
	The speaker maybe blocked.	Clean the surface of the speaker.
You cannot communicate with other group members.	The frequency or signaling type maybe inconsistent with that of other members.	Verify that your TX/RX frequency and signaling type are correct.
	You may be too far away from other members.	Move towards other members.
You hear unknown voices or noise.	You may be interrupted by radios using the same frequency.	Change the frequency, or adjust the squelch level.
	The radio in analog mode maybe set with no signaling.	Request your dealer to set signaling for the current channel to avoid interference
You are unable to hear anyone because of too much noise and hiss.	You may be too far away from other members.	Move towards other members.
	You may be in an unfavorable position. For example, your communication may be blocked by high buildings or blocked in an underground area.	Move to an open and flat area, restart the radio, and try again.
	It may be the result of external disturbance (such as electromagnetic interference).	Stay away from equipment that may cause interference.
The radio keeps transmitting.	VOX may be turned on or the headset is not installed in place	Turn off the VOX function. Check that the headphones are in place.
You cannot use the keys.	The keypad may not work temporarily.	Restart the radio.

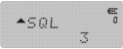
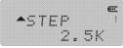
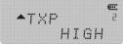
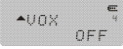
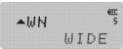
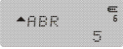
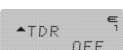
NOTE: If the above solutions cannot fix your problems, or you may have some other queries, please contact your dealer for more technical support.

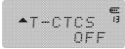
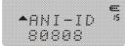
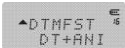
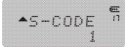
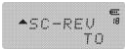
Appendix B. - Technical Specifications

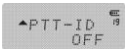
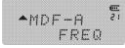
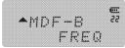
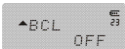
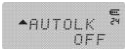
Frequency Range	TX:144-148MHz, 420-450MHz Scanner:136-174MHz, 400-520MHz FM Receive:76-108MHz
Memory Channel	128 Groups
Operation Voltage	DC 7.4 V $\pm 10\%$
Battery Capacity	large capacity battery (Li-Ion)
Output Power	8W(H)/2W(L)
Transmission current	$\leq 1800\text{mA}$
Receive Sensitivity	0.25 μV (12dB SINAD)
Rated Audio Power Output	1W @16 ohms
Receive current	$\leq 380\text{mA}$
Rated Audio Distortion	$\leq 5\%$
Connection for accessories	2 pin Kenwood jack
Antenna impedance	50 Ohm

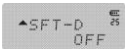
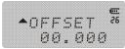
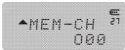
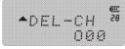
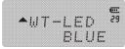
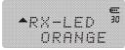
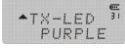
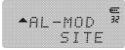
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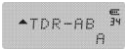
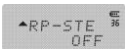
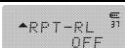
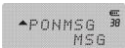
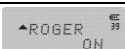
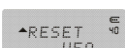
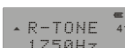
Appendix C. - Shortcut Menu operations

MENU No.	Name (Full Name)	Enter item	LCD display	Select able
0	SQL - Squelch Level	MENU+0		0-9 Levels 0:Lowest 9:Highest
1	STEP –Step Frequency	MENU+1		2.5K/5.0K/6.25K/10.0K 12.5K/20.0K/25.0K/50.0K
2	TXP – Transmit Power	MENU+2		Switch power
3	SAVE - Battery Saving	MENU+3		OFF: 1:1 2:2 3:3 4:4
4	VOX - VOX	MENU+4		OFF, 1-9 OFF: off 1: Highest Sensitivity 9: Highest Sensitivity
5	WN-Wide/Narrow	MENU+5		WIDE:25.0K NARR:12.5K
6	ABR –Auto Backlight	MENU+6		OFF/1,2,3...8, 9,10 *Time-out for the LCD backlight. (seconds)
7	TDR – Dual Watch Operation	MENU+7		OFF ON *Monitor [A] and [B] at the same time. The display with the most recent activity ([A] or [B]) becomes the selected display.

13	T-CTCS - Transmitter CTCSS	MENU+13		OFF 67.0HZ...254.1HZ *Transmits a specific and continuous sub audible signal to unlock the squelch of a distant receiver (usually a repeater).
14	VOICE - Voice Reminding	MENU+14		OFF CHI ENG *Allows audible voice confirmation of a key press.
15	ANI-ID -ANI-ID	MENU+15		It can be programmed by software
16	DTMFST - DTMFST	MENU+16		OFF: No DTMF Side Tones are heard DT-ST : Side Tones are heard only from manually keyed DTMF codes ANI-ST: Side Tones are heard only from automatically keyed DTMF codes DT+ANI : All DTMF Side Tones are heard
17	S-CODE - Signal Code	MENU+17		1,...,15
18	SC-REV - Scanner Resume Method	MENU+18		TO : Time Operation - scanning will resume after a fixed time has passed CO : Carrier Operation -scanning will resume after the signal disappears SE : Search Operation -scanning will not resume

19	PTT-ID - PTT-ID	MENU+19		OFF: No ID is sent BOT: The selected S-CODE is sent at the beginning EOT: The selected S-CODE is sent at the ending BOTH : The selected S-CODE is sent at the beginning and ending
20	PTT-LT – PTT ID delay	MENU+20		0,1,2...,50ms *PTT-ID Delay (milliseconds)
21	MDF-A - Channel A Display Mode	MENU+21		FREQ: Displays programmed Frequency CH: Displays the channel number NAME: Displays the channel name *Note: Names must be entered using software.
22	MDF-B - Channel B Display Mode	MENU+22		FREQ: Displays programmed Frequency CH: Displays the channel number NAME: Displays the channel name *Note: Names must be entered using software.
23	BCL – Busy Channel Lock-out	MENU+23		OFF ON *Disables the [PTT] button on a channel that is already in use. The transceiver will sound a beep tone and will not transmit if the [PTT] button is pressed when a channel is already in use.
24	AUTOLK –Automatic Keypad Lock	MENU+24		OFF ON *When ON, the keypad will be locked if not used in 8 seconds. Pressing the [#NO] key for 2 seconds will unlock the keypad.

25	SFT-D – Frequency Offset Direction	MENU+25		OFF: TX = RX (simplex) +: TX will be shifted higher in frequency than RX -: TX will be shifted lower in frequency than RX
26	OFFSET -Frequency shift amount	MENU+26		00.000...69.990 *Specifies the difference between the TX and RX frequencies
27	MEM-CH - Store a Memory Channel	MENU+27		000...127 *This menu is used to either create new or modify existing channels (0 through 127) so that they can be accessed from MR/Channel Mode
28	DEL-CH - Delete a memory channel	MENU+28		000...127 *This menu is used to delete the programmed information from the specified channel (0 through 127) so that it can either be programmed again or be left empty.
29	WT-LED- Standby Backlight	MENU+29		OFF/ BLUE/ ORANGE/ PURPLE
30	RX-LED- Receive Backlight	MENU+30		OFF/ BLUE/ ORANGE/ PURPLE
31	TX-LED- Transmit Backlight	MENU+31		OFF/ BLUE/ ORANGE/ PURPLE
32	AL-MOD - Alarm Mode	MENU+32		SITE: Sounds alarm through your radio speaker only TONE: Sending alarm tone CODE: Sending alarm code

34	TDR-AB - Transmit selection while in Dual Watch mode	MENU+34		OFF A band transmit (Upper row frequency) B band transmit (Bottom row frequency) *When enabled, priority is returned to selected display once the signal in the other display disappears.
35	STE - Squelch Tail Elimination	MENU+35		ON OFF *This function is used eliminate squelch tail noise between handhelds that are communicating directly (no repeater). Reception of a 55 Hz or 134.4 Hz tone burst mutes the audio long enough to prevent hearing any squelch tail noise.
36	RP-STE-Squelch Tail Elimination	MENU+36		OFF/ 1,2,3...10 *This function is used eliminate squelch tail noise when communicating through a repeater.
37	RPT-RL - Delay the squelch tail of repeater	MENU+37		OFF/ 1,2,3...10 *Delay the Tail Tone of Repeater (X100 milliseconds)
38	PONMSG-Power On Message	MENU+38		FULL: Performs an LCD screen test at power-on MSG : Displays a 2-line power on message *Controls the behavior of the display when the transceiver is turned on.
39	ROGER - Roger Beep	MENU+39		OFF ON *Sends an end-of-transmission tone to indicate to other stations that the transmission has ended.
40	RESET – Restore defaults	MENU+40		VFO: Menu initialization ALL: Menu and channel initialization *Resets the radio to factory defaults, with some exceptions.
41	R-TONE–Repeater Tone	MENU+41		1000Hz/1450Hz/1750Hz/2100Hz *To send out a repeater tone; You hold down the [PTT] + [SOS] key.

Appendix D. - DCS Table

DCS CODE LIST

Number	Code	Number	Code	Number	Code	Number	Code	Number	Code
1	D023N	2	D025N	3	D026N	4	D031N	5	D032N
6	D036N	7	D043N	8	D047N	9	D051N	10	D053N
11	D054N	12	D065N	13	D071N	14	D072N	15	D073N
16	D074N	17	D114N	18	D115N	19	D116N	20	D122N
21	D125N	22	D131N	23	D132N	24	D134N	25	D143N
26	D145N	27	D152N	28	D155N	29	D156N	30	D162N
31	D165N	32	D172N	33	D174N	34	D205N	35	D212N
36	D223N	37	D225N	38	D226N	39	D243N	40	D244N
41	D245N	42	D246N	43	D251N	44	D252N	45	D255N
46	D261N	47	D263N	48	D265N	49	D266N	50	D271N
51	D274N	52	D306N	53	D311N	54	D315N	55	D325N
56	D331N	57	D332N	58	D343N	59	D346N	60	D351N
61	D356N	62	D364N	63	D365N	64	D371N	65	D411N
66	D412N	67	D413N	68	D423N	69	D431N	70	D432N
71	D445N	72	D446N	73	D452N	74	D454N	75	D455N
76	D462N	77	D464N	78	D465N	79	D466N	80	D503N
81	D506N	82	D516N	83	D523N	84	D526N	85	D532N
86	D546N	87	D565N	88	D606N	89	D612N	90	D624N
91	D627N	92	D631N	93	D632N	94	D645N	95	D654N
96	D662N	97	D664N	98	D703N	99	D712N	100	D723N

101	D731N	102	D732N	103	D734N	104	D743N	105	D754N
106	D023I	107	D025I	108	D026I	109	D031I	110	D032I
111	D036I	112	D043I	113	D047I	114	D051I	115	D053I
116	D054I	117	D065I	118	D071I	119	D072I	120	D073I
121	D074I	122	D114I	123	D115I	124	D116I	125	D122I
126	D125I	127	D131I	128	D132I	129	D134I	130	D143I
131	D145I	132	D152I	133	D155I	134	D156I	135	D162I
136	D165I	137	D172I	138	D174I	139	D205I	140	D212I
141	D223I	142	D225I	143	D226I	144	D243I	145	D244I
146	D245I	147	D246I	148	D251I	149	D252I	150	D255I
151	D261I	152	D263I	153	D265I	154	D266I	155	D271I
156	D274I	157	D306I	158	D311I	159	D315I	160	D325I
161	D331I	162	D332I	163	D343I	164	D346I	165	D351I
166	D356I	167	D364I	168	D365I	169	D371I	170	D411I
171	D412I	172	D413I	173	D423I	174	D431I	175	D432I
176	D445I	177	D446I	178	D452I	179	D454I	180	D455I
181	D462I	182	D464I	183	D465I	184	D466I	185	D503I
186	D506I	187	D516I	188	D523I	189	D526I	190	D532I
191	D546I	192	D565I	193	D606I	194	D612I	195	D624I
196	D627I	197	D631I	198	D632I	199	D645I	200	D654I
201	D662I	202	D664I	203	D703I	204	D712I	205	D723I
206	D731I	207	D732I	208	D734I	209	D743I	210	D754I

Appendix E. - CTCSS Table

CTCSS CHART (Hz)

Number	Frequency	Number	Frequency	Number	Frequency	Number	Frequency	Number	Frequency
1	67.0	2	69.3	3	71.9	4	74.4	5	77.0
6	79.7	7	82.5	8	85.4	9	88.5	10	91.5
11	94.8	12	97.4	13	100	14	103.5	15	107.2
16	110.9	17	114.8	18	118.8	19	123.0	20	127.3
21	131.8	22	136.5	23	141.3	24	146.2	25	151.4
26	156.7	27	159.8	28	162.2	29	165.5	30	167.9
31	171.3	32	173.8	33	177.3	34	179.9	35	183.5
36	186.2	37	189.9	38	192.8	39	196.6	40	199.5
41	203.5	42	206.5	43	210.7	44	218.1	45	225.7
46	229.1	47	233.6	48	241.8	49	250.3	50	254.1

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Attention in case of use

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For the warning information of the frequency restriction, please refer to the package or manual section.

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