Thank you for your purchase of the product.
This quad-band FM transceiver will deliver instant reliable communication.
Please read this manual carefully before use!

BEFORE PROCEEDING INSURE:
• Qualified technicians shall service this equipment only. Do not modify the radio for any reason.
• Use only original supplied or approved accessories.
• Turn off your radio prior to entering any area with explosive and flammable materials. Do NOT USE your transceiver at a gas/fuel station.
• Do not expose the radio to direct sunlight over a long time, nor place it close to a heating source.
• If the unit emits smoke or an odor, you should immediately cut off the power supply. Then send the radio to the nearest service center or dealer.
• Do not operate the mobile transceiver on high power unless it is necessary. Do not transmit for long periods of time, as it may overheat the transceiver.
• Keep the unit away from dusty, damp and wet environments.
Unpacking and Inspecting

- Please check the packaging of your radio for any signs of damage.
- Carefully open the box, and confirm your received the items listed below.
- If you find the radio or the included accessories are damaged or lost, immediately contact your dealer.

What's in the Box
Overview

Antenna
Power/Volume Knob
EXIT Key & A/B/C/D signal switching
Speaker
Scan Key
DOWN Key
Progress knob
Keylock switch
LCD color screen
MENU Key
UP Key
Numeric Keypad
VFO/MR Key
Long press to alarm
PTT Key (Push to talk)
FM Key
FM radio function key
Monitor Key [MONI]
External Speaker/MIC Connector
Belt Clip
Battery pack
## Color Display and Icon Descriptions

- **Hi/Lo power indicator**
- **Battery save Enabled**
- **Positive/Negative Offset indicator**
- **Sound pressure indicator bar**
- **Current TX/RX status**
- **VOX function enabled**
- **Current signaling**
- **Current working mode**
- **Main Frequency**
- **Secondary frequency**
- **Model**
- **Current working mode**
- **Pound # Key (Keypad Lock)**
- **Star ✱ Key**
- **Turning the unit ON**
- **Turning the unit OFF**
- **Adjusting the volume**

### Basic Shortcuts And Use

#### Pound # Key (Keypad Lock)

To enable or disable the keypad lock, press and hold the `[#]` key for about two seconds. A quick toggle of the `#` will alternate power levels from High power to Low power. The keypad lock will lock both the main radio buttons itself. The PTT and MONI Buttons will not be locked when enabled.

#### Star ✱ Key

A short momentary press of the key enables the reverse function (reverses the TX/RX settings according to Offset settings). 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. To enable scanning, press and hold the [✱SCAN] key for about two seconds.

#### Turning the unit ON

To turn the unit on, simply push and hold the power/volume knob until it turns on. If your radio powers on correctly there should be an audible tone after about one second and the display will show a message or flash the LCD depending on settings.

#### Turning the unit OFF

To turn the unit off, simply push and hold the power/volume knob until it turns off. The unit is now off.

#### Adjusting the volume

To turn up the volume, turn the volume knob clockwise. To turn the volume down, turn the volume knob counter-clock-wise.

△ By using the monitor function (MONI button), you can more easily adjust your volume by adjusting it to the un-squelched static.
Making a call
Press and hold the PTT button to transmit. While transmitting, speak approximately 3-5cm (1-2 inches) from the microphone. When you release the PTT your transceiver will go back to its receive mode.

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. For details on how to program your transceiver see Chapter "Programming". Ultimately which mode you end up using will depend entirely on your use case.

Frequency (VFO) mode
In Frequency (VFO) mode you can navigate up and down the band by using the \[ Y \] and \[ Z \] keys (or rotating the selector knob). Each press (or rotation click) will increment or decrement your frequency according to the frequency step you’ve set your transceiver to (Menu Item 1: Step).
You can also input frequencies directly on your numeric keypad with kilohertz accuracy. However, the radio will floor to the nearest frequency that corresponds to your frequency step, in other words, when you input frequencies with greater than 1kHz resolution (such as 145.6875 MHz in the example below), always round your input up.

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.

Channel (MR) mode
The use of Channel (MR) mode is dependent on actually having programmed in some channels to use. To find out more on how to program channels see Chapter Programming.
Once you have channels programmed and ready, you can use the \[ A \] and \[ V \] keys to navigate between channels (or Rotate the Selector Knob). If you have channels programmed with Transmit power set to Low, you can use the key to momentarily switch over to high power if you’re having trouble getting through.

Monitor Both VFO & MR Modes
You can toggle from VFO and MR (Memory Recall) mode by pressing the \[ VFO/MR \] button.
The VFO/MR mode will only toggle on the current selected A/B/C/D line – while the other channel lines will remain on channel or memory mode as they were selected. This allows you to monitor channel and frequency mode simultaneously.
Quick Menu Settings
To set the Menu options use the [MENU] Key to select and confirm the changes, while rotating the selector knob (or using the [A]/[Y] keys) will change your settings.

0. [Enter Menu]+[0]: TMR
   This mode selects what displays are monitored in the background besides the primary selected channel. You can mix and match between all or partial channels to allow dual, tri, or quad watch.

1. [Enter Menu]+[1]: STEP
   Set the frequency increments step in VFO mode: 2.5kHz, 5kHz, 6.25kHz, 10kHz, 12.5kHz, 25kHz selectable.

2. [Enter Menu]+[2]: SQL
   Sets the receiver squelch level: 0 is OFF, 1 is the lowest setting through 9 which is the highest setting.

3. [Enter Menu]+[3]: TXP
   Sets the transmit power setting from HIGH to LOW.

4. [Enter Menu]+[4]: SCR
   Scrambler (Optional Function)
   Please confirm with the supplier before use whether this function can be used.

5. [Enter Menu]+[5]: TOT
   Transmission time-out timer. Sets the maximum transmit time from 15 to 600 seconds (15 second steps).

6. [Enter Menu]+[6]: SAVE
   Turns power save mode OFF or ON.

7. [Enter Menu]+[7]: WN
   WIDE or NARROW band width settings (12.5/25kHz).

8. [Enter Menu]+[8]: ABR
   Unused Setting.

9. [Enter Menu]+[9]: BEEP
   Turns key beeps OFF or ON.

10. [Enter Menu]+[1]+[0]: R-DCS
    DCS receive/squelch settings. Options include the D023N-D754N positive sequence and the D023I-D754I reversed sequence.

11. [Enter Menu]+[1]+[1]: R-CTCSS
    CTCSS receive/squelch settings. Selectable from 67.0Hz-254.1Hz. you can use the keypad to quickly enter in the desired setting.

12. [Enter Menu]+[1]+[2]: T-DCS
    DCS transmit settings. Options include the D023N-D754N positive sequence and the D023I-D754I reversed sequence.

13. [Enter Menu]+[1]+[3]: T-CTCSS
    CTCSS transmit settings. Selectable from 67.0Hz-254.1Hz. you can use the keypad to quickly enter in the desired setting.

14. [Enter Menu]+[1]+[4]: D-SUB
    Turns CTCSS/DCS code display OFF or ON.

15. [Enter Menu]+[1]+[5]: DTMFSST
    DTMF transmit tone settings.
    • OFF : No tones heard through the speaker when transmitting.
    • KEY : Only manually keyed DTMF codes are heard.

16. [Enter Menu]+[1]+[6]: BCL
    Busy channel lock-out. If you have this turned on the transmitter will not transmit if a channel is receiving at the time.

17. [Enter Menu]+[1]+[7]: SC-ADD
    Scan settings.
    • OFF: This removes the channel from the scan list.
    • ON: This adds the channel to scanning list.

18. [Enter Menu]+[1]+[8]: SC-REV
    Scanning settings.
    • TO : Time out scan, after the stopping on an active signal, scanning will resume after a few seconds.
    • CO : Scanning will stop on a carrier channel and will resume after the carrier channel stops receiving.
    • SE : Scanning will stop once an active carrier channel is found.

• ANI : Only automatically keyed DTMF codes are heard.

• BOTH : All DTMF codes are heard.
19. [Enter Menu]+[1]+[9]: OPTSIG
Turn on the optional signaling. OFF the channel or mode will not use optional signaling.
• DTMF : DTMF signaling required.
• ZTONE : 2 tone signaling required.
• STONE : 5 tone signaling required.
(PTTID code information can only be set by the PC software)
22. [Enter Menu]+[2]+[2]: PTT-LT
PTT-ID transmit delay setting. (Delay Time range is 0-30 seconds.). This is the delay time before transmitting the PTTID.
23. [Enter Menu]+[2]+[3]: S-INFO
Signal information and automatic dialing memory. 1-15 group signal code/decode memory. The memory list is programmed through software.
24. [Enter Menu]+[2]+[4]: EMC-TP
Alarm mode settings.
• EOT : send ID code at End of Transmit.
• BOTH : send ID code at both beginning and end of transmit.
• QT : The squeal will open for just a CTCSS or DCS Receive tone.
• AND : This requires both the optional tone settings (Menu 20) and CTCSS/DCS settings to be received.
• OR : If a either the DCS/CTCSS or optional signaling is received the squeal will open.
25. [Enter Menu]+[2]+[5]: EMC-CH
Alarm channel setting. This is the channel that the alarm will transmit the PTTID and Alarm sound on.
26. [Enter Menu]+[2]+[6]: SIG-BP
Pager Ring at Reception of Matching 2Tone/5Tone/DTMF. (on/off)
27. [Enter Menu]+[2]+[7]: CHNAME
Channel name edit.
28. [Enter Menu]+[2]+[8]: CA-MDF
Display Mode (Display A).
• FREQ : displays Frequency.
• CH : displays channel number.
• NAME : displays assigned channel name.
29. [Enter Menu]+[2]+[9]: CB-MDF
Display Mode (Display B).
• FREQ : displays Frequency.
• CH : displays channel number.
• NAME : displays assigned channel name.
30. [Enter Menu]+[3]+[0]: FREQ
Set the VOX sensitivity from 1 to 10 levels or turn OFF.
31. [Enter Menu]+[3]+[1]: CD-MDF
Display Mode (Display D).
• FREQ : displays Frequency.
• CH : displays channel number.
• NAME : displays assigned channel name.
32. [Enter Menu]+[3]+[2]: LANGUA
Language Display Mode (English or Chinese)
33. [Enter Menu]+[3]+[3]: VOICE
Voice prompt function
• OFF : No voice prompt.
• ENG : English voice prompt selected.
• CHI : Chinese voice prompt selected.
34. [Enter Menu]+[3]+[4]: VOX
VOX function
Sets the VOX sensitivity from 1 to 10 levels or turn OFF.
35. [Enter Menu]+[3]+[5]: VOX-T
Keypad auto-lock setting. This activates the display assigned channel name.
• OFF : No voice prompt.
• ENG : English voice prompt selected.
• CHI : Chinese voice prompt selected.
keypad auto-lock feature, which lock the key-
pad after 8 seconds of no use; pressing the #
key for 2 seconds will release the auto lock.

37. [Enter Menu]+[3]+[7]: ST-FC
Status (Top) Bar Display Color (Text): Color
options are BLACK, WHITE, RED, BLUE,
GREEN, YELLOW, INDIGO, PURPLE, GRAY.

38. [Enter Menu]+[3]+[8]: MF-FC
Primary Frequency Display Color (Text): Col-
or options are BLACK, WHITE, RED, BLUE,
GREEN, YELLOW, INDIGO, PURPLE, GRAY.

39. [Enter Menu]+[3]+[9]: SFA-FC
Channel A Display Color (Text): Color options
are BLACK, WHITE, RED, BLUE, GREEN,
YELLOW, INDIGO, PURPLE, GRAY.

40. [Enter Menu]+[4]+[0]: SFB-FC
Channel B Display Color (Text): Color options
are BLACK, WHITE, RED, BLUE, GREEN,
YELLOW, INDIGO, PURPLE, GRAY.

41. [Enter Menu]+[4]+[1]: SFC-FC
Channel C Display Color (Text): Color options
are BLACK, WHITE, RED, BLUE, GREEN,
YELLOW, INDIGO, PURPLE, GRAY.

42. [Enter Menu]+[4]+[2]: SFD-FC
Channel D Display Color (Text): Color options
are BLACK, WHITE, RED, BLUE, GREEN,
YELLOW, INDIGO, PURPLE, GRAY.

43. [Enter Menu]+[4]+[3]: SUB-FC
CTCSS/DCS code Display Color (Text): Color
options are BLACK, WHITE, RED, BLUE,
GREEN, YELLOW, INDIGO, PURPLE, GRAY.

44. [Enter Menu]+[4]+[4]: FM-FC
Battery voltage_FM Radio Frequency Dis-
play Color (Text): Color options are BLACK,
WHITE, RED, BLUE, GREEN, YELLOW, IN-
DIGO, PURPLE, GRAY.

45. [Enter Menu]+[4]+[5]: SIG-FC
Status (Bottom) Bar Display Color (Text): Col-
or options are BLACK, WHITE, RED, BLUE, GREEN,
YELLOW, INDIGO, PURPLE, GRAY.

46. [Enter Menu]+[4]+[6]: MENUC
On Screen Menu Color (Text): Color options
are BLACK, WHITE, RED, BLUE, GREEN,
YELLOW, INDIGO, PURPLE, GRAY.

47. [Enter Menu]+[4]+[7]: TX-FC
Transmit Active Channel Text Color: Color
options are BLACK, WHITE, RED, BLUE,
GREEN, YELLOW, INDIGO, PURPLE, GRAY.

48. [Enter Menu]+[4]+[8]: RX-FC
Receive Active Channel Text Color: Color
options are BLACK, WHITE, RED, BLUE,
GREEN, YELLOW, INDIGO, PURPLE, GRAY.

49. [Enter Menu]+[4]+[9]: MEM-CH
Saves the selected channel.

50. [Enter Menu]+[5]+[0]: DEL-CH
Deletes the selected channel.

51. [Enter Menu]+[5]+[1]: SFT-D
Frequency difference direction setting.
• OFF : no frequency difference.
• (+) : Transmit offset amount will be a pos-
tive offset (higher than the receive
frequency).
• (−) : Transmit offset will be a negative offset
(amount will be lower than the receive
frequency).

52. [Enter Menu]+[5]+[2]: OFFSET
Difference between the transmit and receive
frequency.

53. [Enter Menu]+[5]+[3]: ANI
Displays the radio ID code. Code only can set
by PC software.

54. [Enter Menu]+[5]+[4]: ANI-L
ID code length. Length = 3, 4, 5.

55. [Enter Menu]+[5]+[5]: REP-S
Tone burst repeater settings. Pressing CALL
will send a predetermined tone. Options are
1000 Hz, 1450 Hz, 1750 Hz, 2100 Hz.

56. [Enter Menu]+[5]+[6]: TMR-MR
Transmit Delay Return time. Delay time before
returning to the primary channel after the sec-
ondary signal is clear. (PTT Return Time)

57. [Enter Menu]+[5]+[7]: STE
Squelch Tail Elimination at the end of a re-
ceived signal. Requires both transmitting radi-
ois to have the option ON.

58. [Enter Menu]+[5]+[8]: RP-STE
Repeater Squelch Tail Elimination requires a
repeater with this function ON. (Reverses the
CT/DCS settings at the end of a transmission
to quickly turn off the squelch)
59. [Enter Menu]+[5]+[9]: RPT-DL
Repeater Squelch Tail Eliminator Delay time.
(use with Menu 46)

60. [Enter Menu]+[6]+[0]: DTMF-G
Adjust the gain of the DTMF tones. Selectable from 0-15. 0 being the quietest level and 15 being the loudest modulated DTMF tones.

61. [Enter Menu]+[6]+[1]: TMR-TX
Transmit in multi-standby.
- FIXED : Set current frequency as primary frequency.
- TRACK : Set current frequency as track frequency.

62. [Enter Menu]+[6]+[2]: RESET
Reset all VFO settings or ALL settings. (channels deleted and VFO settings cleared)

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### Menu definitions

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<td>This mode selects what displays are monitored in the background besides the primary selected channel. You can mix and match between all or partial channels to allow dual, tri, and quad watch.</td>
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<tr>
<td>1</td>
<td>STEP Frequency Step Size Setup</td>
<td>2.5 to 25kHz</td>
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<td></td>
<td></td>
<td>2.5, 5, 6.25, 10, 12.5, 25kHz</td>
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<tr>
<td>2</td>
<td>SQL Squelch Level</td>
<td>00 &gt; 09</td>
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<tr>
<td></td>
<td></td>
<td>10 squelch levels</td>
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<td>00 = minimum / normally open</td>
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<tr>
<td>3</td>
<td>TXP Transmit Power</td>
<td>High, Low</td>
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<td></td>
<td></td>
<td>Full Power, Reduced Power</td>
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<td>4</td>
<td>SCR</td>
<td>Scrambler</td>
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<td>5</td>
<td>TOT</td>
<td>TX Time Out Timer</td>
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<td>6</td>
<td>SAVE</td>
<td>Power save mode</td>
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<td>7</td>
<td>WN</td>
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<td>9</td>
<td>BEEP</td>
<td>Keypad Voice Prompt</td>
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<td>R-DCS</td>
<td>Receive - Digital Coded</td>
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<td>11</td>
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<td>Transmit - DCS Code</td>
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<td>13</td>
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<td>14</td>
<td>D-SUB</td>
<td>Optional Signaling</td>
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<td>15</td>
<td>DTMFST</td>
<td>DTMFST</td>
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<td>16</td>
<td>BCL</td>
<td>Busy Channel Lockout</td>
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<td>SC-ADD</td>
<td>Add Scan Channel</td>
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<td>SC-REV</td>
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<td>Menu Quick Review Menu Quick Review</td>
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</table>

| 20 SPMUTE Speaker Mute Settings | QT Squelch opens for CTCSS/DCS tones only. |
| AND Squelch opens when CTCSS/DCS tone is recognized along with the optional signaling. |
| OR Squelch opens when either the CTCSS/DCS tone OR the optional signaling is recognized. |

| 21 PTT-ID PTT ID - When to send | OFF Do not send |
| BOT Send at Beginning of Transmission |
| EGOT Send at the End of Transmission |
| BOTH Send at both Beginning and End |

| 22 PTT-LT PTT ID - Transmit Delay | 0 > 30 Set Delay Time before transmitting PTT-ID |

| 23 S-INFO Auto Group Dialing | Group Signal Code Memory 1 > 15 (Can only be set with software) |

| 24 EMC-TP Alarm Mode | ALARM Turn on Alarm sound |
|ANI Send Alarm code and ID code |
|BOTH Both of the above |
|OFF Alarm Mode Completely Disabled |

| 25 EMC-CH Alarm Channel | 000 > 199 Specified Alarm Channel |

| 26 SIG-BP Signal Beep | ON Pager Ring at Reception of Matching 2Tone/5Tone/DTMF |
|OFF Tone OFF |

| 27 CHNAME Channel Name Edit | In Channel Mode, edit the Current Name |

| 26 CA-MDF Channel A Display Mode | FREQ In Channel Mode, display the selected format in display A |
|CH NAME |

| 29 CB-MDF Channel B Display Mode | FREQ In Channel Mode, display the selected format in display B |
|CH NAME |

| 30 CC-MDF Channel C Display Mode | FREQ In Channel Mode, display the selected format in display C |
|CH NAME |

| 31 CD-MDF Channel D Display Mode | FREQ In Channel Mode, display the selected format in display D |
|CH NAME |

| 32 LANGUA Language | English Screen Prompts Display |
|Chinese |

| 33 VOICE Voice prompt | OFF No voice prompt |
|ENG English voice prompt selected |
|CHI Chinese voice prompt selected |

| 34 VOX VOX function | OFF VOX function disabled |
|1 > 10 VOX sensitivity level |
| 35 | VOX-T | VOX delay time | 0 > 20 | Delay time from the disappearance of the voice signal until the stop of transmission after VOX is launched. |
| 36 | AUTOlk | Auto Keypad Lock | ON | Keypad Auto Lock Enabled |
| 37 | ST-FC | Status (Top) Bar Display Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 38 | MF-FC | Primary Frequency Display Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 39 | SFA-FC | Channel A Display Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 40 | SFB-FC | Channel B Display Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 41 | SFC-FC | Channel C Display Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 42 | SFD-FC | Channel D Display Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 43 | SUB-FC | CTCSS/DCS code Display Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 44 | FF-FC | Battery volt./FM Radio Freq. Display Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 45 | SIG-FC | Status (Bottom) Bar Display Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 46 | MENUFC | On Screen Menu Color (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |

| 47 | TX-FC | Color when the current activating frequency transmitting (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 48 | RX-FC | Color when the current activating frequency receiving (Text) | Select Color | BLACK, WHITE, RED, BLUE, GREEN, YELLOW, INDIGO, PURPLE, GRAY |
| 49 | MEM-CH | Memorize Channel | 000 > 199 | Indicates channel number to be stored. |
| 50 | DEL-CH | Delete Channel | 000 > 199 | Indicates channel number to be deleted. |
| 51 | SFT-D | Frequency Shift Direction | + | Plus frequency shift |
| 52 | OFFSET | Frequency Shift Offset Amount | 00.00 > 69.99 | Frequency shift in MHz |
| 53 | ANI-L | ANI Length | 3, 4, 5 | Length of ANI ID code |
| 54 | REP-S | Repeater Activation Tone | 1000Hz, 1450Hz, 1750Hz, 2100Hz | Audible tone for repeater activation |
| 55 | TMR-MR | TMR - Return Time Delay to Primary Channel | OFF | Function OFF - Transmits always on Primary Channel |
| 56 | STE | Squelch Tail Elimination | OFF | Eliminates squeal tail at end of transmission. |

20 | MENU QUICK REVIEW | | 21
Table:

<table>
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<tr>
<th>Item</th>
<th>Function</th>
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<tbody>
<tr>
<td>RP-STE</td>
<td>Repeater Squelch Tail Elimination, Requires a repeater using this function.</td>
</tr>
<tr>
<td>RPT-DL</td>
<td>Repeater squelch tail delay.</td>
</tr>
<tr>
<td>DTMF-G</td>
<td>DTMF Gain/Audio Level</td>
</tr>
<tr>
<td>TMR-TX</td>
<td>Transmit in multi-standby</td>
</tr>
<tr>
<td>RESET</td>
<td>Initialize to Factory Defaults</td>
</tr>
</tbody>
</table>

Programming

Frequency Mode vs. Channel Mode

Switch between Modes by Using the [VFO/MR] Button. 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.

- All programming must be initially done in the frequency mode (VFO) only. From there you have the option of assigning the entered data to a specific channel for access in the channel mode.
- Call tones, TX/RX tones, squelch, and power settings are adjustable on saved channels in channel mode.
- Programming channels are different from the VFO settings; the offset settings are not stored, instead you enter a TX frequency directly (e.g. 145.000 RX with an offset of +600 Would be a TX frequency of 145.600).
Other Settings

- **Toggle from High to Low Power**
  A quick press the `[#]` will alternate power levels from High power to Low power.

- **Storing an FM Radio Station and Scanning**
  Use PC software to store FM radio channels names, you can name the FM channel and instead of display the frequency your FM station will display the name. (Software FM option (FM channels are not stored, only the channel names are)) Press the `[#SCAN]` Key to scan the FM radio.

- **Keypad Lock-out**
  Hold the `[#]` for 2 seconds at standby to turn on/off the keypad lock-out function. (The Lock icon appears, when the radio is locked out)

- **PTT ID Setting**
  1. Use PC software to change PTT-ID code.
  2. Set the Menu 18 settings on the radio to select the PTTID signal mode (2Tone, 5Tone, or DTMF).
  3. Set the Menu 20 settings to select when the PTTID is transmitted.
  4. Set the Menu 21 settings to program the PTTID transmit delay time.
  5. When all the settings are set, when you transmit (Press the PTT) The radio will transmit the PTTID.

- **DTMF RX Settings**
  This radio has DTMF coding and decoding. Use the PC software to set the DTMF signal settings first.

- **DTMF TX Settings**
  In two-way radio systems, DTMF is most commonly used for automation systems and remote control. A common example would be in amateur radio repeaters where some repeaters are activated by sending out a DTMF sequence (usually a simple single-digit sequence).

<table>
<thead>
<tr>
<th>DTMF frequencies and corresponding codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1209Hz 1336Hz 1477Hz 1633Hz 1875Hz 2046Hz 2203Hz 2373Hz</td>
</tr>
<tr>
<td>697Hz 770Hz 852Hz 941Hz 1023Hz 1118Hz 1209Hz 1336Hz</td>
</tr>
<tr>
<td>1 2 3 A -</td>
</tr>
<tr>
<td>4 5 6 B</td>
</tr>
<tr>
<td>7 8 9 C</td>
</tr>
<tr>
<td>*0 # D -</td>
</tr>
</tbody>
</table>

The product has a full implementation of DTMF, including the A, B, C and D codes. The numerical keys, as well as the `[#]`, keys correspond to the matching DTMF codes as you would expect. The A, B, C and D codes are located in the [MENU], [A], [B] and [EXIT] keys respectively (*). Manual TX DTMF Tones: To manually send DTMF codes, press the key(s) while holding down the [PTT] key. Automatically TX DTMF Tones: Save it to Memory and Transmit: You can also program a DTMF tone to the saved calling list (requires the PC software) to the one of the 15 Memory call banks in the radio. To transmit select the Pre-set DTMF saved setting on Menu 22 and then press the [PTT] key to send the saved DTMF TX tone.

- **Remote Stun**
  First set the DTMF Remote Stun Tone and Master Control ID in Software: When your radio receives the DTMF Remote Stun Tone Sequence (Set by software) (Requires Menu 18 and 19 to accept DTMF signaling) it will command the radio to disable transmitting abilities. The Master ID station must first identify and send the PTTID (set in software as “Master ID”) – once the Master Station identifies itself, the radio is set to receive command tones, if the Remote Stun signal is received - the radio will no longer be able to transmit. Both the master ID station and remote stun signal must be set up in software.

- **Remote Kill**
  First set the DTMF Remote Kill Tone and Master Control ID in Software: When your radio receives the DTMF Remote Kill Tone Sequence (Set by software) (Requires Menu 18 and 19 to
accept DTMF signaling) it will command the radio to disable transmitting and receiving. The Master ID station must first identify and send the PTTID (set in software as “Master ID”) – once the Master Station identifies itself, the radio is set to receive command tones, if the Monitor Remote Kill tone is received - the radio will no longer be able to transmit or receive. Both the master ID station and remote stun signal must be set up in software.

Remote Revive
First set the DTMF Remote Revive Tone and Master Control ID in Software: When your radio receives the DTMF Remote Revive Tone Sequence (Set by software) (Requires Menu 18 and 19 to accept DTMF signaling) it will reactivates the radio after it has been remotely stunned or killed. The Master ID station must first identify and send the PTTID (set in software as “Master ID”) – once the Master Station identifies itself, the radio is set to receive command tones, if the Monitor Remote Kill tone is received - the radio will revived from a stun/kill command. Both the master ID station and remote stun signal must be set up in software.

DTMF Receive Settings, Transmit Setting
3. If properly set up (on Menu 18 and 19), your radio will open the squelch when it receives the required DTMG signal.
4. Press [PTT] Key to send the same DTMF you have selected in Menu 22.

2TONE Receive Settings, Transmit Setting
2. Press [MENU] Key select 22 S-INFO, press [MENU] Key select pre-code signal group (1-15). (The 2Tone Signal must be saved first in the PC software setting under 2TONE settings)
3. If properly set up (on Menu 18 and 19), your radio will open the squelch when it receives the required 2TONE signal.
4. Press [PTT] Key to send the same 2TONE you have selected in Menu 22.

5Tone Receive Settings, Transmit Setting
2. Press [MENU] Key select 22 S-INFO, press [MENU] Key select pre-code signal group (1-15). (The 5Tone Signal must be saved first in the PC software setting under 5TONE settings)
3. If properly set up (on Menu 18, and 19), your radio will open the squelch when it receives the required 5TONE signal.
4. Press [PTT] Key to send the same 5TONE you have selected in Menu 22.

Scanning modes
The scanner is configurable to one of three ways of operation: Time, carrier or search, each of which is explained in further details in their respective section below.

Setting scanner mode
1. Press the [MENU] key to enter the menu.
2. Enter “17” on your numeric keypad to come to scanner mode.
3. Press the [MENU] key to select.
4. Use the [D] and [Y] keys to select scanning mode.
5. Press the [MENU] key to confirm and save.
6. Press the [EXIT] key to exit the menu.

Time operation:
In Time Operation (TO) mode, the scanner stops when it detects a signal, and after a factory preset time, it resumes scanning.

Carrier operation:
In Carrier Operation (CO) mode, the scanner stops when it detects a signal, and after a factory preset time with no signal it resumes scanning.

Search operation:
In Search Operation (SE) mode, the scanner stops when it detects a signal. To resume scanning you must press and hold the key again.
## Technical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GENERAL</strong></td>
<td></td>
</tr>
<tr>
<td>Frequency Range (MHz)</td>
<td>VHF: 136<del>174MHz (220</del>270MHz)  UHF: 400<del>480MHz (350</del>390MHz)</td>
</tr>
<tr>
<td>Memory channels</td>
<td>200</td>
</tr>
<tr>
<td>Frequency stability</td>
<td>±2.5ppm</td>
</tr>
<tr>
<td>Frequency step (kHz)</td>
<td>2.5K/5.0K/6.25K/10.0K/12.5K/25.0K</td>
</tr>
<tr>
<td>Squelch Setup</td>
<td>CARRIER / CTCSS / DCS / 5Tone / 2TONE / DTMF</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-20°C to +60°C</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>7.4V DC±15%</td>
</tr>
<tr>
<td>Dimension</td>
<td>62 x 128 x 35 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>230g</td>
</tr>
</tbody>
</table>

| **RECEIVER**           |                                                                      |
| Broadband              |                                                        |
| Narrow band            |                                                        |
| Sensitivity            | ≤0.25μV                                                             |
| Channel choice         | ≥70dB                                                               |
| Intermodulation        | ≥65dB                                                               |
| Spurious Rejection     | ≥70dB                                                               |
| Audio response         | +1~3dB (0.3~3KHz)                                                  |
| Signal to noise ratio  | ≥45dB                                                               |
| Audio Distortion       | ≤5%                                                                 |
| Audio output power     | ≥1W±10%                                                             |

| **TRANSMIT**           |                                                                      |
| Broadband              |                                                        |
| Narrow band            |                                                        |
| Output power           | 4W                                                                   |
| Modulation Mode        | 16K0F3E                                                             |
| Channel Power          | ≥70dB                                                               |
| Signal to noise ratio  | ≥40dB                                                               |
| Parasitic harmonic     | ≥60dB                                                               |
| Audio response         | +1~3dB (0.3~2.55KHz)                                               |
| Audio distortion       | ≤5%                                                                 |