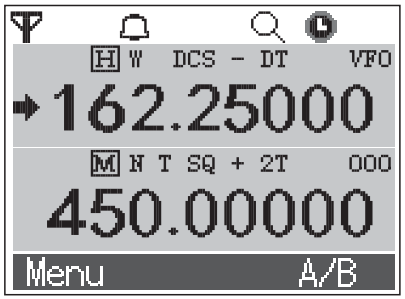
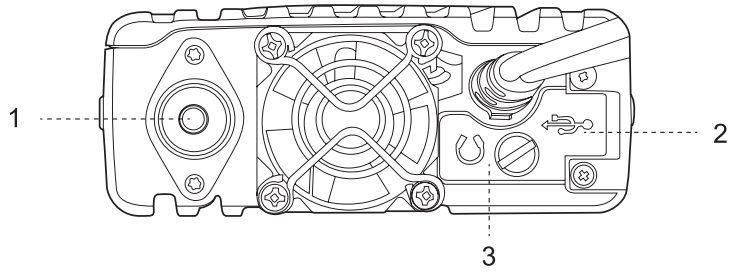
Display



NO.	Icon	Function
1	000	Memory Channel Number
2	H M L	High Power Output / Middle Power Output/ Low Power Output
3	W/M/N	Wide Bandwidth/ Middle Bandwidth/ Narrow Bandwidth
4	DT/2T/5T	Signaling
5	T	CTCSS Encode
6	SQ	CTCSS Decode
7	DCS	DCS Encode and Decode
8		Beep
9		Auto Power-off
10	VFO	Frequency Mode
11	+	Positive Direction of Offset

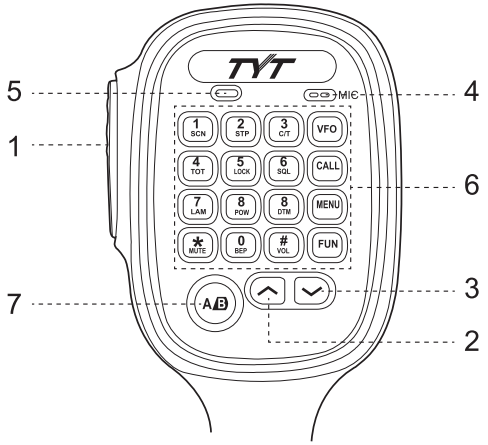
NO.	Icon	Function
12	–	Negative Direction of Offset
13		Home Screen Position
14		Scan
15		Lock the Keypad
16		GPS is allowed to receive (the small circle would be disappear when the GPS has signal)

Rear Panel



Microphone

NO.	Port	Function
1	ANT	Connection for 50Ω antenna
2	DATA	PC programming data port
3	EXT SP	Terminal for optional external speaker



NO.	Icon	Function
1	PTT	Press the key to transmit
2	∧	Decrease volume or setting value
3	∨	Increase volume or setting value
4	MIC	Speak here during transmission
5	Indicate light	Indicate light will red during transmission
6	Number Key	Input channel number or DTMF dial out etc.
7	A/B	Exchange to the home screen and sub screen

Basic Operation

Switching the Power On/Off

According to the option selected during installation, press the key for 1s to power on radio. Press the key for 2s to power off radio.

Adjusting the Volume

Turn the VOL knob clockwise to increase the audio level, counterclockwise to decrease.
Note: during the communication, volume can be adjusted more accurate.

Switch between VFO and Channel Mode

In standby, press the [V/M] key or [VFO] key of microphone, this indicates will display current channel in channel mode. Repeat above operation to switch between Frequency (VFO) mode and channel mode.

Adjusting Frequency/Channel through Selector Knob

Under frequency (VFO) mode, you can change the current frequency to the desired one through selector knob; Turn clockwise to increase frequency, turn counterclockwise to decrease. Every gear will increase or decrease one step; press the MHZ key, the integer of the frequency in screen will be flashing. In this status, you can turn the knob or press Mic's [∧/∨] key to adjust the frequency quickly by 1MHZ step.

This product has 12 step sizes for users selecting: 2.5K、5K、6.25K、7.5K、8.33K、10K、12.5K、15K、20K、25K、30K and 50K

In the channel mode, you can change the current channel to the desired one through

turn knob, clockwise turn to the forward channel, anticlockwise turn to the backward channel. In relative working mode, press microphone's [∧/∨] key has same function for adjusting frequency and channel.

Note: When you press Mic's [∧/∨] key can't adjust the frequency/channel, please press the Mic's [#] key to switch the function of the [∧/∨] key.

Receiving

When the channel you are operating is called, the screen shows RX and field intensity, in this way, you can hear the calling from transmitting party.

Note: If the transceiver has set at higher squelch level, it may fail to hear the calling.

When the channel you are operating is called, the screen shows RX and field intensity, you can't hear the calling from transmitting party, it means current channel receives a matching carrier but unmatching signaling (Refer to CTCSS/DCS encode and decode or Optional Signaling set up).

Transmitting

Press **[MONI]** key to open monitor for a while to confirm the channel desired is not busy, press **[MONI]** key again to cancel the monitor, then press **[PTT]** key to speak into microphone.

Please hold the microphone approximately 2.5-5.0 cm from your lips, and then speak into the microphone in your normal speaking voice to get best timbre.

NOTE: Press and hold **[PTT]** key, LED light red and power intensity showed in screen indicates, that is means it is transmitting, release to receive.

Transmitting Tone-Pulse

Press and hold **[PTT]** key, then press Mic's [∨] key to transmit current selected tone-pulse signal.

Transmitting Optional Signaling

Press and hold **[PTT]** key, then press Mic's [∧] key to transmit pre-stored and selected DTMF/2Tone/5Tone optional signaling.

Channel Edit

1. Under frequency mode (VFO), turn selector knob to select the desired frequency or input frequency by Mic's numeric keys.
2. Select the desired CTCSS/DCS signaling in the menu.
3. Long press **[M/V]** key, the channel number of screen will flashing
4. Turn selector knob to select the desired channel number to store. (if users want to store the frequency only, press Low key at first then operate the 5th instruction.)
5. Press **[F]** key or Mic's **[FUN]** key to stored current channel, press **[PTT]** key or Mic's **[MENU]** key cancel store.

NOTE: When under the memory channel mode, press **[MHZ]** key can store current information into VFO channel.

Channel Delete

1. Long press **[M/V]** key enter to the delete memory channel mode.
2. Turn selector knob to select the channel which you want to delete.
3. Press **[SCAN]** key to delete the current channel.

Shortcut Operations

Frequency Scan

In frequency mode (VFO), this function is designed to monitor signal of every communicative frequency point of transceiver “step size” you have set.

1. In VFO mode, press [SCAN] key to enter into frequency scan
2. Turn selector knob or press Mic’s **[∧/∨]** key to change scan direction.
3. Press **[SCAN]** key or Mic’s **[FUN]** key to exit.

Offset Direction and Offset Frequency Set up

Repeater receives a signal (UP-LINK) on one frequency and re-transmits on another frequency (DOWN-LINK). The difference between these two frequencies is called the offset frequency. If the UP-LINK frequency higher than DOWN-LINK frequency, the direction is positive, if it is lower, the shift direction is negative.

1. Long press **[LOW]** key, the LCD displays offset direction and offset frequency.
2. Repeatedly long press **[LOW]** key to select positive offset and negative offset.
3. When LCD displays **[+]** icon, it indicates positive offset, which means transmitting frequency higher than receiving frequency.
4. When LCD displays **[-]** icon, it indicates negative offset, which means transmitting frequency lower than receiving frequency.
5. Turn selector knob or Mic’s **[∧/∨]** key to change offset frequency, offset frequency changed as per stepping.

6. Press **[A/B]** key or **[PTT]** key to exit into standby.

Note:

1. Offset frequency value can be inputted by Mic’s numeric keys, the input method is same as method of input frequency.
2. Under channel mode, this operation can be temporarily used by user. Once the radio is turned off or switched to another channel, the temporary setting will be erased.

Operation of the composite key

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon flashing, then press composite key "X".
2. Repeatedly press composite key "X" to switch the corresponding list.
3. Press **[F]** key or **[PTT]** key to exit.

Beep (FUN+0)

1. Press **[F]** key or Mic's **[FUN]** key, the LCD displays **[Menu]** icon is flashing, then press Mic's **[0]** key, LCD display " " icon, that is means the function of keypad tone is opened.
2. Repeatedly the above operation, when the " " icon is disappear, this function is disable.

Channel Scan (FUN+1)

In channel mode, this function is designed to monitor signal in every channel.

1. In channel mode, press **[Scan]** key or press **[FUN]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press Mic's **[1]** key, then LCD displays icon, then can enter into channel scan.
2. Turn selector knob or press Mic's **[∧/∨]** key to change scan direction.
3. If the boundary channel is useful, press **[MHZ]** key or Mic's **[FUN]** key can change the scan type to scan in the boundary channel.
4. Press **[Scan]** key or Mic's **[FUN]** key to exit.

Frequency Channel Step Setup (Fun+2)

Only in frequency mode (VFO), this function is valid.

1. In VFO mode, press **[FUN]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press Mic's **[2]** key, then LCD displays the current step.
2. Repeatedly press **[2]** key to change the value of step.
3. Press **[FUN]** key to save. Press **[PTT]** key or Mic's **[FUN]** key to exit.

CTCSS/DCS Frequency Setting (FUN 3/Tone)

This function is used to receive and transmit CTCSS/DCS frequency. (The current channel should be have CTCSS/DCS)

1. When the current channel have CTCSS/DCS, press **[FUN]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the **[Tone]** key or Mic's **[3]** key enter to adjust the CTCSS/DCS.
2. Turn selector knob to change the CTCSS/DCS
   If there is CTCSS, press **[F]** key can switch to the CTCSS setting
   If there is DCS, press **[F]** key to set the Positive and negative direction of the DCS.
3. Press **[PTT]** key or Mic's **[FUN]** key to exit.

TOT (FUN+4)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the Mic's **[4]** key enter to adjust the TOT.
2. Press the **[4]** key to change the time of the TOT.

Keypad Lockout (FUN+5)

Squelch Level Setting (FUN+6/A/B)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the Mic's 6/A/B key enter to the squelch level setting to switch the level: 0~9 of squelch level.

LCD Backlight Display Time Setting (FUN+7)

1. Press **[F]** key or Mic's **[FUN]** key, the [Menu] icon will flashing, then press the Mic's **[7]** key to switch the backlight display time: Normally open/5s/10s

High/Mid/Low Power Selection (FUN+8)

1. Press **[F]** key or Mic's **[FUN]** key, the [Menu] icon will flashing, then press the Mic's **[8]** key to switch the power: High/Mid/Low.

DTMF Current Channel Edit (FUN+9/Scan)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press the **[Scan]** key or Mic's **[9]** key, enter the DTMF channel edit mode, it can edit the current channel (If user wants to edit other DTMF channel, please change the channel in the menu at first).
2. Press the Mic's **[∧/∨]** key or **[Low]/[Moni]** to adjust the character position by last bit or next bit.
3. Turn the selector knob to change the current character or use microphone to input the corresponding character directly.
4. Press **[A/B]** key to save the current content. Press **[MHZ]/[Menu]** key to delete the current character.

5. Press **[PTT]** key to exit.

Channel Deleted Quickly (FUN+VFO)

1. Press **[F]** key or Mic's **[FUN]** key, the **[Menu]** icon will flashing, then press **[VFO]** key to delete the content of current memory channel.

Note: The "0" channel is prohibited to delete.

Channel Copied Quickly (FUN+Call)

1. Press **[F]** key or Mic's **[FUN]** key, the [Menu] icon will flashing, then press **[Call]** key to copy the content of current channel to the next memory channel.

Talk Around (FUN+*)

The transmitting frequency will same with the receiving frequency if turn on this function.

Note: This function is useless if there is not have offset frequency between transmitting frequency and receiving frequency of the current channel.

Reverse Frequency (FUN+#)

When users turn on this function, the transmitting frequency and receiving frequency would be exchange, the frequency of transmitting would be changed to the receiving frequency, the frequency of receiving would be changed to the transmitting frequency. If the current channel has set the CTCSS/DCS signaling, the CTCSS/DCS encode and CTCSS/DCS decode would be exchanged.

Note: This function is useless if there is not have offset frequency between transmitting frequency and receiving frequency of the current channel.

Menu

1. Signaling
2. Scan
3. Contacts (Gps Optional)
   Select the desired Gps contact
   Select: Choose the GPS contact when calling
   View Number: View the current GPS channel number
   View GPS: Remote view the desired radio's GPS info
4. Setting
   Radio setting
   Radio Info
   GPS Info (Optional)
   Radio setting

Function	vailable Values
Function	Available Values
Signal Select	OFF/DTMF/2Tone/5Tone
Sql Model	SQL/Sig
Power Level	Hig Power/Mid Power/Low Power
Bandwidth	Width/Middle/Narrow
CTC/DCS	Ctc Encode/Ctc Decode/Dcs Encode/Dcs Decode

Function	vailable Values
Busy Lock	OFF/CTC/DCS/Carrier
DTMF ID	001
5Tone ID	12345
TOT	Infinite/1/2…/30Minutes
Auto Power Off	OFF/30/60/120Minutes
DTMF Sending Time	50/100/200/300/500MS
Sql Level	OFF/LEV 1/…LEV 9
Scan Mode	TO/CO/SE
Display Mode	Vfo Mode/CH Display Mode/MR Display Mode
TBST Fre	1750HZ/2100HZ/1000HZ/1450HZ
Password Lock	OFF/ON
Back Light	On/5S/10S
Step	2.5K/5K/6.25K/7.5K/8.33K/10K/12.5K/15K/20K
	/25K/30K/50K
Sub Screen	OFF/frequency/Voltage
KeyFun Lo	A/B/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE
KeyFun Mz	A/B/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE
KeyFun CT	AB/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE
KeyFun V/M	AB/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE
KeyFun AB	AB/ LOW/ MONI/ SCAN/ TONE/ M/V/ MHZ/MUTE

Function	vailable Values
Instr Screen	OFF/Char String/Picture
Ch Display	Frequency/Name
TX Chanel	Last Receive/Select
TX Inh	Tx Enable/Tx Inhibit
Gps Rx (Optional)	Enable/Disable
Gps Tx (Optional)	Enable/Disable
Reset	Factory/Set up
Sub Screen Prompt	Enable/Disable

Menu Operation

Procedure:

1. Short press [Menu] key or long press [F] key enter into the menu mode.
2. Turn selector knob or [+/-] key to select the desired menu number.
3. Press [F] key ,then turn selector knob or press [+/-]key to select the desired parameters
4. After the set, press the [F] key or [Menu] key to saved and returned to the higher level menu, press the [A/B] key or [Vfo] key to cancel and returned the higher level menu.
5. Press [PTT] key to exit.

Menu: Signal Select

Function: Select the Signaling Type

Available Values: OFF/DTMF/2Tone/5Tone

Default: OFF

Menu: Squelch Mode

Function: Squelch Mode Setting

Available Values: SQL/Sig

Default: SQL

Menu: Power Level

Function: Power Setting

Available Values: Hig Power/Mid Power/Low Power

Default: High Power

Menu: Bandwidth Selection

Function: Bandwidth Setting

Available Values: Wide/Middle/Narrow

Default: Wide

Menu: CTCSS/DCS Selection

Function: CTCSS/DCS Frequency Setting

Available Values: Ctc Encode/Ctc Decode/Dcs Encode/Dcs Decode

Menu: Busy Lock

Function: Busy Channel Lockout Setting

Available Values: Off/CTCSS/Carrier

Default: OFF/CTC/DCS/Carrier

Menu: DTMF ID

Function: Display Radio DTMF ID

Menu: 5 Tone ID

Function: Display Radio 5 Tone ID

Menu: TOT

Function: Set the Time-out Timer

Available Values: Infinite/1～30Minutes

Default: 6 Mins

Menu: Auto Power Off

Function: The radio will power-off when there is no operation for a specified period of time

Available Values: OFF/30/60/120 Minutes

Default: OFF

Menu: DTMF Sending Time

Function: Set the DTMF sending Time

Available Values: 50/100/200/300/500MS

Default: 50MS

Menu: Sql Level

Function: Adjust the Squelch Level

Available Values: OFF/LEV1~LEV9

Default: 5

Menu: Scan Mode

Function: Select the Scan Mode

Available Values: TO/CO/SE

Default: CO

Menu: Display Mode

Function: Select the Display Mode

Available Values: Vfo Mode/CH Display Mode/MR Display Mode

Default: Frequency

Menu: TBST Fre

Function: Select the TBST Frequency

Available Values: 1750/2100/1000/1450

Default: 1750

Press [PTT]+Mic's[∨] key to transmit

Menu: Password Lock

Function: Turn On/Off the Password

Available Values: OFF/ON

Default: OFF

Note: the default password "000000" can input by programming software, input the exactly password can enter the standby interface. Press Mic's [MENU] key to empty the inputted password.

Menu: Back light

Function: Set the Backlight

Available Values: ON/ 5S/10S

Default: ON

Menu: Step

Function: Select the Step

Available Values: 2.5/5/6.25/7.5/8.33/10/12.5/15/20/25/30/50K

Default: 12.5k

Menu: Skip

Function: Whether the Current Channel is allowed to Scan

Available Values: Enable/Disable

Default: Enable

Menu: Sub Screen

Function: Display Type of Sub Screen

Available Values: OFF/Frequency/Voltage

Default: Voltage

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

Default: LOW

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

Default: LOW

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

Default: MHZ

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

Default: Tone

Menu: KeyFun Setting

Function: Program the Key Assignment

Available Values: AB/LOW/MONI/Scan/Tone/M/V/MHZ/Mute

Default: V_M

Menu: Instr Screen

Function: Select the Instr Screen

Available Values: OFF/Picture/Character

Default: OFF

Menu: TX Chanel

Function: Select the Channel Display Type

Available Values: Frequency/Name

Default: Frequency

Menu: Transmit Disabled

Function: Turn on/off the Transmit Disabled

Available Values: Enable/Disable

Default: Enable

Menu: Reset

Function: Factory Reset Operate

Available Values: Factory Frequency/Factory Setting

Menu: GPS RX

Function: The radio is enabled or disabled to receive the GPS info from other radio

Available Values: Enable/Disable

Menu: GPS TX

Function: the radio is enabled or disabled to send the GPS info

Available Values: Enable/Disable

Menu: Sub Screen Ring

Function: If there have voice prompt when the sub screen receiving the signal.

Available Values: OFF/ON

Key Setting

AB/LOW/MONI/SCAN/TONE/M/V/MHZ/MUTE

1. A/B key
   Short press: Switch the home screen/sub screen
   Long press: Switch the frequency band of the current VFO
2. LOW key
   Short press: Switch output power level
   Long press: Switch the frequency offset direction
3. MONI key
   Short press: Start the monitor
   Long press: Turn on/off the channel name display
4. SCAN key
   Short press: Start scan
   Long press: Turn on/off scan
5. TONE key
   Short press: switch the CTCSS/DCS mode
6. M/V key
   Short press: Switch frequency/channel mode
   Long press: Store the channel
7. MHZ key
   Short press: 1M step

Long press: 10M step

8. MUTE key

Short press: Volume halving

Other keys

1. Mic's VFO key

Short press: Switch frequency/channel mode

2. Mic's CALL key

Short press: Signaling call

3. Mic's MENU key

Short press: Set Menu

4. Mic's Fun key

Short press: Switch on composite key

5. Mic's * key

Short press: Volume halving

6. Mic's # key

Switch the function of the Mic's +/- key: Volume/frequency halving

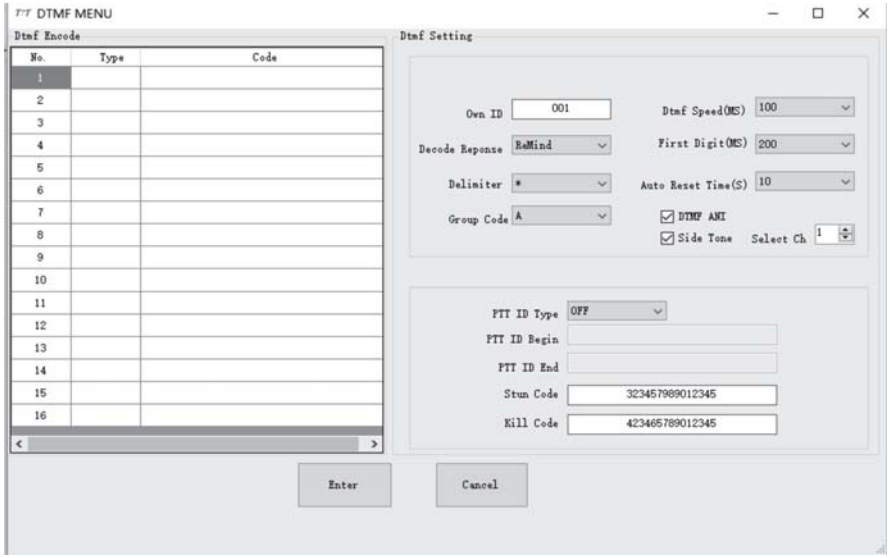
7. Mic's A/B key

Short press: Switch the home screen/sub screen

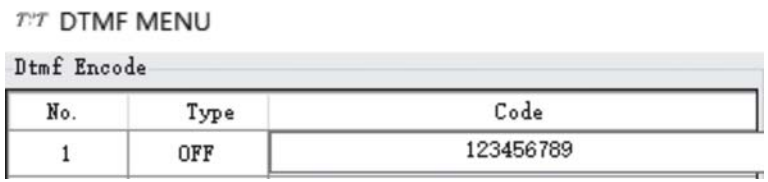
DTMF operation

DTMF decoding (In programming software)

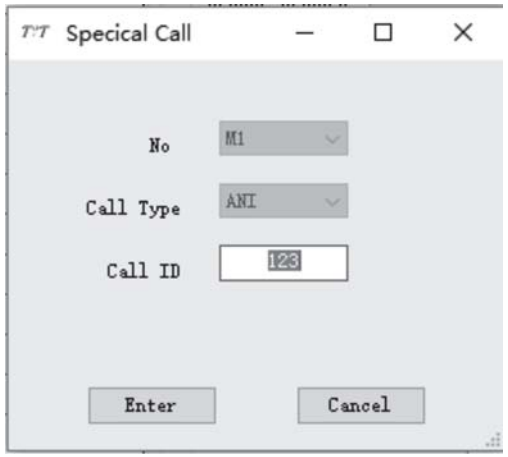
1. Select the DTMF encode type



1）“OFF”, users can input the desired DTMF code directly

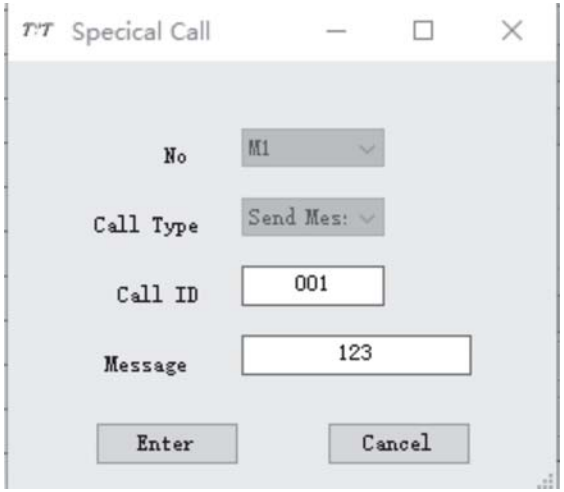


2）“ANI”, users only should input the call ID, which is called radio ID



3）“Message”, users should input the call ID firstly which is called radio ID, and then input the Message.

Note: Because DTMF does a long time for message, this function only supports simple message function.



DTMF setting

Stun code: when the radio receives the corresponding DTMF code, the radio will be remote stunned and disabled transmit.

Kill code: when the radio receives the corresponding DTMF code, the radio will be remote killed and disabled receive and transmit.

Select Ch: The default channel when the DTMF is calling

DTMF operating:

When the signaling of channel selects the DTMF, the current channel will automatically check if the DTMF signaling is received and decoding it. And achieve a corresponding function according to the received code. The function including: Turn on the squelch, ANI display, message, remote stun, and remote kill.

Note: when the radio is remote stunned or killed, it can be released by programming.

2 Tone Operation

2 Tone encode

Input: the frequency of first tone and second tone

Note: the frequency between of the first tone and second tone should not too similar to avoid the decoding is wrong.

2 Tone decode

Decode Format: the combination of decode, for example: A-B, you should make sure the frequency of first tone is A, and second tone is B. other combination is similar.

5 Tone Operation

5 Tone encode

The write way is same with the DTMF.

5 Tone decode

Function: The function will be achieved when the radio receives the corresponding code.

Select: Turn on squelch

Stun/kill: same with DTMF

Wake: release the state of stun/kill

Simple Trouble Shooting

Problem	Possible Causes and Potential Solutions
(a) Power is on, nothing appears on Display.	+ and - polarities of power connection are reversed. Connect red lead to plus terminal and black lead to minus terminal of DC power supply.
(b) Fuse is blown.	Check and solve problem resulting in blown fuse and replace fuse with new fuse.
(c) Display is too dim.	Dimmer setting is “LAMP-L”. Please make the dimmer setting “LAMP-H”.
(d) No sound comes from speaker.	Squelch is muted. Decrease squelch level. Tone or CTCSS/DCS squelch is active. Turn CTCSS or DCS squelch off.
(e) Key and Dial do not function.	Key-lock function is activated. Cancel Key-lock function.
(f) Rotating Dial will not change memory channel.	Transceiver is in CALL mode. Press the VFO or memory mode.
(g) PTT key is pressed but transmission does not occur.	Microphone connection is poor. Connect microphone properly. Antenna connection is poor. Coonect antenna properly.

Specifications

General

Frequency	VHF: 144 -148 MHz UHF: 420-450MHz
Channel	200
Frequency stability	±1ppm
Operating temperature	-30˚C~+60˚C
Operating voltage	13.8V DC
Dimension	107x125x45mm

Receiver

Sensibility	0.2μV
Adjacent channel selectivity	60dB@12.5KHz 70dB@25KHz
Inter modulation	≥60dB/≥65dB
Spurious rejection	≥70dB
Audio response	+1~-3dB
Audio distortion	<5%
FM hum and noise	≥45dB@12.5KHz ≥40dB@25KHz
Rated audio	4W