USER MANUAL

VHF Transceiver
TM-8102 / TM-8104

UHF Transceiver
TM-8402 / TM-8404

Printed in Korea

Table of Contents

1. Safety / Warnings

Notices

⚠ **Warning**
- Government law restricts the operation of unlicensed radio transmitters within government controlled territories.
- Illegal operation is punishable by fine or imprisonment or both.
- Refer service to qualified technicians only.

⚠ **Warning**
EXPLOSIVE ATMOSPHERES (GASES, DUST, FUMES, etc.)
Shut OFF the transceiver while refueling or while parked in gasoline service stations.
Do not carry spare fuel containers in the trunk of your vehicle if your transceiver is mounted in the trunk area

⚠ **Warning**
INJURY FROM RADIO FREQUENCY TRANSMISSIONS
Do not operate your transceiver when somebody is either touching the antenna or standing within two to three feet of it to avoid the possibility of radio frequency burns or related physical injury.

Precautions

Please read carefully the following precautions to prevent fire, personal injury, or transceiver damage:

⚠ **Caution**
- Do not attempt to configure your transceiver while driving, it is dangerous.
- This transceiver is designed for a 13.8V DC power supply. Don't use a 24V battery including over DC 16V supply to power on the transceiver.
- Do not put the transceiver in excessively dusty, humid or wet areas, nor unstable surfaces.
- Do not modify the transceiver for any reason.
- Please keep it away from interferential devices (such as TV, generator, Medical devices etc.)
- Do not expose the transceiver to long periods of direct sunlight nor place it close to heating appliances.
- If an abnormal odor or smoke is detected coming from the transceiver, turn OFF the power immediately. Contact an Authorized Dealer.
- Do not transmit with high output power for extended periods; the transceiver may overheat.
- Do not operate the transceiver when vehicle engine is stopped for extended periods. The vehicle engine may not be started due to low battery.
- Do not use incompatible accessories from other manufactures. It could result in damage and or malfunction to the accessory and or to the radio.

Preparation

⚠ **Warning**
Electronic equipment in your vehicle may malfunction if they are not properly protected from the radio frequency energy which is present while transmitting.
Typical examples include electronic fuel injection, anti-skid braking, and cruise control. If your vehicle contains such equipment, consult the dealer for the make of vehicle and enlist his/her aid in determining if they will perform normally while transmitting

Power Cable Connection

⚠ **Caution**
The transceiver operates on 12V negative ground systems only! Check the battery polarity and voltage of vehicle before installing the transceiver.

1. Check for an existing hole, conveniently located in the firewall, where the power cable can be passed through.
   - If no hole exists, use a circle cutter to drill a hole, then install a rubber grommet
2. Run the power cable though the firewall and into the engine compartment.
3. Connect the red lead to the (+) battery terminal and the black lead to the negative (-) battery terminal.
   - Place the fuse as close to the battery as possible.
4. Coil the surplus cable and secure it with a retaining band.
   - Be sure to leave enough slack in the cables so the transceiver can be removed for servicing while keeping the power applied.

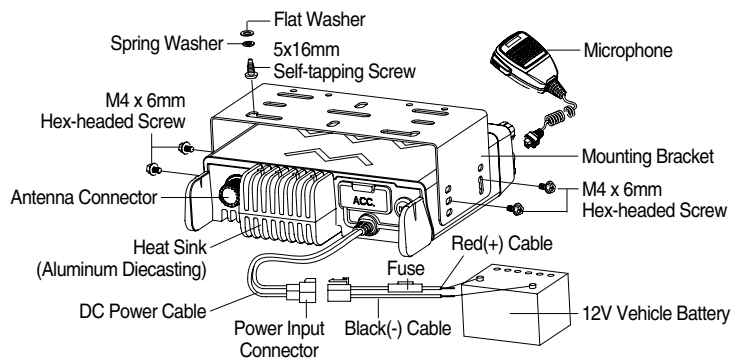## Installing the Transceiver

⚠ **Warning**
For passenger safety, install the transceiver securely using the supplied mounting bracket and screw set so the transceiver will not break loose in the event of a collision.

1. Mark the position of the hole in the dash, using the mounting bracket as a template. Using a 4.2mm (5/32 inch) drill bit, drill the holes, then attach the mounting bracket using the supplied screws.
   - Mount the transceiver within easy reach of the user and where there is sufficient space at the rear of the transceiver for cable connections.
2. Connect the antenna and the supplied power cable to the transceiver.
3. Slide the transceiver into the mounting bracket and secure it using the supplied hex-headed screws.
4. Mount the microphone hanger in a location where it will be within easy reach of the user.
   - The microphone and microphone cable should be mounted in a place where they will not interfere with the safe operation of the vehicle.

⚠ **Caution**
When replacing the fuse in the DC power cable, be sure to replace it with a fuse of the same value. Never replace a fuse with one that is rated with a higher value.

Flat Washer
Spring Washer
5x16mm
Self-tapping Screw
Microphone
M4 x 6mm
Hex-headed Screw
Mounting Bracket
Antenna Connector
M4 x 6mm
Hex-headed Screw
Heat Sink
(Aluminum Diecasting)
Red(+) Cable
Fuse
DC Power Cable
Power Input
Connector
Black(-) Cable
12V Vehicle Battery
ACC.

Connecting Microphone

1. Insert the microphone plug into jack on the front panel of the transceiver.
   • Be sure the tab on the microphone plug is facing the left hand side (Figure 1-2).
2. Mount the microphone on the microphone hanger where it will be within easy reach of the user.
3. To remove the microphone plug, press the tab on the connector while pulling the plug out of the transceiver jack.
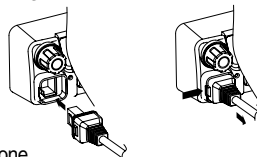
Figure 1-2) Installation and Removing of the Microphone

Supplied Accessories

Carefully unpack the transceiver. We recommend that you identify the items listed below before discarding the packing. If any item are missing or have been damaged during shipment, file a claim with the carrier immediately.

DC power cable with 15A Fuse 1
Mounting Bracket 1
Screw set
　• 5 x 16 mm self-tapping screw 4
　• Hex-headed screw with washer 4
　• Spring washe 4
　• Flat washer 4
ACC-708 Microphone (with cable) 1
Microphone hanger (with 4 x16 mm self-tapping screws) 1
User manual 1

2. Features

The followings are the main features of the TM-8000 Series Mobile Radio:

- 128 x 32 Dots Graphic LCD
- 512 Channels and 32 Groups are selectable.
- Channel spacing: 12.5 / 25kHz (12.5kHz for USA)
- Wide Band Coverage (VHF: 136~174MHz; UHF: 400~470, 450~520MHz)
- Call guard squelch of standardized CTCSS / DCS
- Identification origination (2 Tone and 5 Tone)
- Built-in Scrambler (Inversion Type)
- Built-in Compander (Compressor and Expander)
- GPS Data communication (Option)
- Normal scanning / Priority scanning
- BCL (Busy Channel Lock) / BCLO (Busy Channel Lock Out)
- 5W / 10W / 20W / 40W (UHF) / 50W (VHF) Power Switchable
- Selectable Squelch Level (0~10)
- Time-Out Timer (TOT)
- Standard DTMF Encode and DTMF Decoder with ANI Function
- Programmable Home Channel Function
- Emergency & Built-in Emergency Microphone
- Talk Around
- Internal or External Speaker
- Remote Radio Stun / Revive (Uses 5 tone)
- Ignition Function / Horn Alert / Public Address
- 4W Front-Mounted Speaker
- Heavy-Duty Microphone
- Various Parameters and PC downloading methods
- Built-in D-SUB15 Accessory Connector
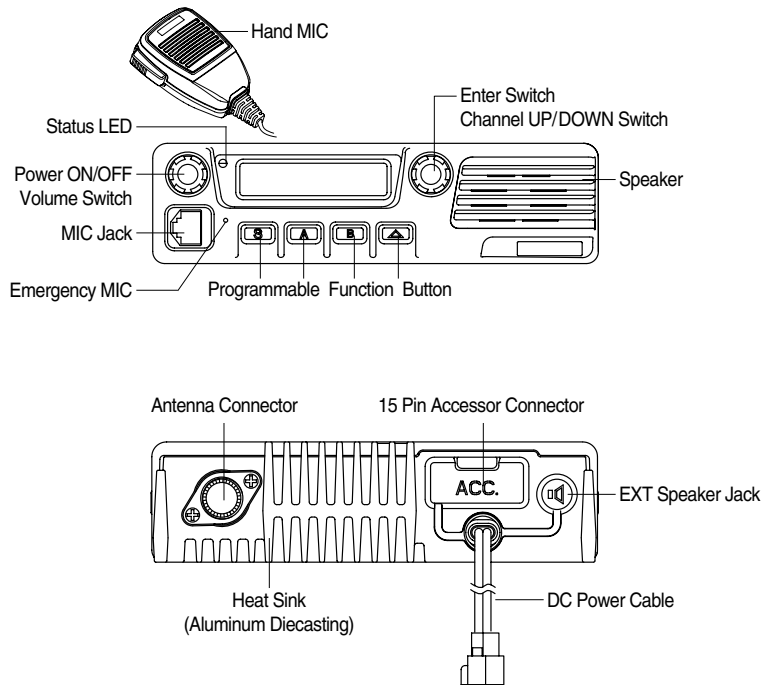- PC Program Tuning

3. Appearance of TM-8000 Series Mobile Radio

Hand MIC

Status LED

Power ON/OFF Volume Switch

MIC Jack

Emergency MIC

Enter Switch Channel UP/DOWN Switch

Speaker

Programmable Function Button

Antenna Connector

15 Pin Accessor Connector

ACC.

EXT Speaker Jack

Heat Sink (Aluminum Diecasting)

DC Power Cable

Figure 4-1) Appearance TM-8000 Series

Accessories
Item Part Number：
ACC-810N: Programming Software (Narrow Band Only - USA Only)
ACC-820NW: Programming Software (Narrow and Wide Band - Outside the USA)
ACC-8025: PC Programming Cable (USB)
ACC-708: Mobile Microphone

4. Controls & Keys

Status LED

Enter Switch Channel UP/DOWN Switch

Power ON/OFF Volume Switch

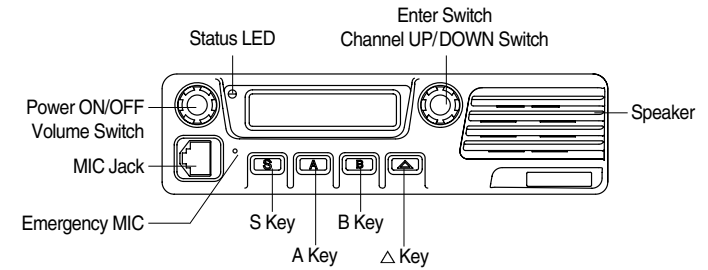MIC Jack

Emergency MIC

S Key

A Key

B Key

△ Key

Speaker

Figure 5-1) TM-8102 / TM-8402 Front panel

Power ON/OFF Volume switch
Press and hold the knob over 2 seconds to turn the mobile radio on and off.

Welcome

SC NM ➡ Team 1

Rotate to adjust the volume level from 1 to 16. Turn it clockwise to increase the volume and counterclockwise to decrease the volume.

When the knob is pushed less than 2 seconds, Squelch can be changed.

Display
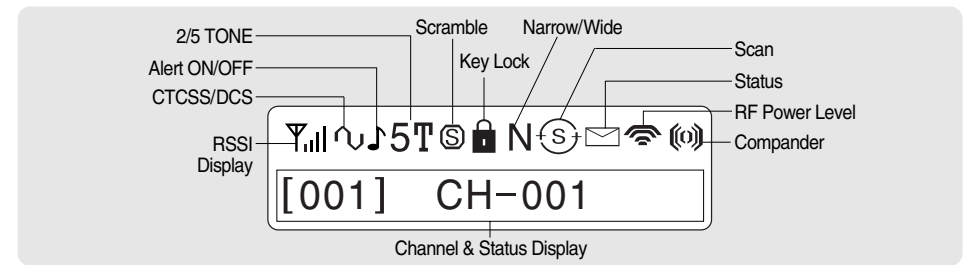It is a 125 x 36 LCD graphic type. Each icon indicates related operation.

2/5 TONE

Alert ON/OFF

CTCSS/DCS

RSSI Display

Scramble

Key Lock

Narrow/Wide

Scan

Status

RF Power Level

Compander

[001] CH-001

Channel & Status Display

Figure 5-2) TM-8000 Series LCD indicator

Channel Selector

Rotate to select a channel. Turn clockwise to increase the channel and counterclockwise to decrease the channel.
Press to select a group if the group is set.
Press and hold over 2 seconds to enter into the menu.

Microphone Jack

Insert the microphone plug into this jack.

S Key

Press the key to activate its programmable function. The default setting is RF power/Selcall.

A Key

Press the key to activate its programmable function. The default setting is Key tone/Menu.

B Key

Press the key to activate its programmable function. The default setting is TX inhibit/Scan.

△ Key

Press the key to activate its programmable function. The default setting is Monitor. When in the Menu, a key press will step back one step. Also used as an exit key.

TX/Busy LED

TX LED lights red while transmitting.

PTT Switch

To send a voice transmission, press and hold the switch, and then speak into the microphone. Release PTT to receive.

4.1 Programmable Key Functions

Keys can be programmed with the functions listed below. Each key has the ability for two functions to be programmed, and are activated with a short press or long press. Please contact your dealer for further details on these functions.

Channel up	Talk around on/off
Channel down	Fast Channel Mode
Monitor on/off	BCL on/off
Key lock on/off	Scrambler on/off
Scan Mode	Scan Add/Remove
Compander on/off	Selcall mode
TX inhibit on/off	TX power change
Key Tone on/off	Emergency
TX Alert on/off	DTMF on/off
*GPS on/off	Horn Alert on/off
Menu	Public Address on/off

*Function can be selected only when GPS is installed.

4.2 Operations

Power ON / OFF

Press and hold the volume knob to turn the radio on.
If the radio is protected with a password, "PASSWORD INPUT" will appear on the display when power is on. To unlock the radio, enter the correct password.

1. Choose a number by rotating the channel selector.
2. Press the selector to input the number.
3. Repeat steps 1 and 2 to enter the whole password.
   If no key is pressed within 10 seconds, the radio will return to the password protect state.
4. Press the selector for more than 1 second to complete the entry.
   Press and hold the volume for approximately 2 seconds to turn the radio off.further details on these functions.

Volume Adjustment

Rotate the volume knob clockwise to increase the volume and counterclockwise to decrease the volume. Maximum increment is 16 levels.

## Channel Selection / Group Selection

Choose the wanted channel/group using the channel selector if it is programmed with a group.
To select a group, push the selector and rotate to the wanted group. Push the selector again to set the wanted group.

Transmitting

```
Y  ♪5T    N Ⓢ    📶
[001]  CH-001
```
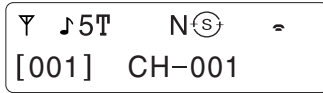
1. Choose the wanted group and a channel.
2. Press and hold the PTT switch, then speak into the microphone.
   For best sound quality at the receiving radio, hold the microphone approximately 5~10cm from your mouth.
3. Release the PTT to receive.
4. When communication is completed, return the microphone to its hanger.

Power Adjustment

```
Yıll ♪5T    N Ⓢ   ( - )
[001]  CH-001        📶    📶    📶
```

Step 1   Step 2   Step 3   Step 4
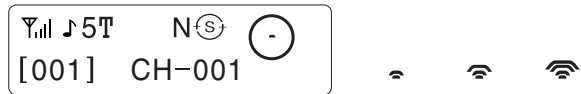
1. Press "S" button (default setting) or a button programmed as power control.
2. Rotate the selector to select one of 4 levels.
   Transmitting output power can be controlled with 4 levels.
   The maximum output power is 40W for UHF and 50W for VHF.

Receiving

```
Yıll ♪5T    N Ⓢ    📶
[001]  CH-001
```
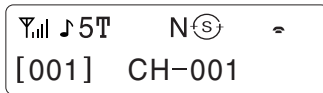
1. Select the wanted group and channel
2. When a call is received, LED becomes green.
   The user should not press the PTT during the reception.

If 2/5 tones are programmed without any matched tones, the radio will not receive properly. Sending and receiving signals are prohibited until the matched tone is received.

Enabling/Disabling Scan

To activate the Scan function, press the "B" key (default setting) or the key programmed as scan over 2 seconds. The scan icon appears on the display.
To stop the Scan, press and hold the "B" key (default setting) over 2 seconds or the key programmed as scan.

Normal Scan

The scan is processed in the sequence of channels when the radio is programmed. While the signal is being received, if you want to return to the scan list without listening to the call, press the "S" button. If you to delete a channel from the scan list during the receiving signal, press the button "A".

Priority Scan

The priority scan is shown as "P-" in conjunction with the channel on the LCD. The priority scan is to check a receiving status between each scan channels per the following: P, S1, P, S2, P, S3. The priority channel is scanned periodically within the normal scanning and the priority is received prior to other signals. During the status of receiving a signal, the channel can be moved to next scan channel by up/down button. Furthermore, the channel of receiving signal can be deleted from the list of scan temporarily. When the priority is received, the channel can not be changed or deleted.

Key Lock

During standby, if a key programmed for key lock is pressed, the key lock icon is shown on the display. The channel selector is halted along with the programmable keys. Only monitor and the volume control are functional.

Selcall

*At programmed SelCall, paging between individuals or groups can be available with 5 tones.
 A maximum of 100 IDs' can be stored in the list.
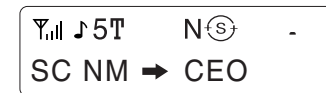*To escape SelCall model, press and hold the channel selector over 2 seconds.

```
Yıll ♪5T    N Ⓢ    -        Yıll ♪5T    N Ⓢ    -
[001]  CH-001                SC NM ➡ Team 2
```
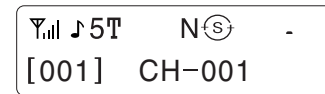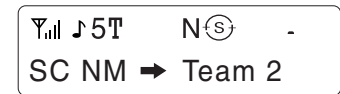
No SelCall operation   SelCall operation

1) Call on SelCall

```
Yıll ♪5T    N Ⓢ    -
SC NM ➡ CEO
```

ID selection

At call waiting, press the "S" key over 2 seconds at default setting or the key programmed   as SelCall. Rotate the selector to select the SelCall channel you want to call. If you want to call "ID: A" in the list, select "A" by the selector.
And then push the selector to send the SelCall signal to the radio you want to call.
If the program is set as sending caller's ID altogether, the receiving radio is shown the caller's ID on the display.

Communication on the SelCall
Select the channel of the party you wish to talk to.
Push the PTT button and then caller's ID is transmitted on that channel.

Emergency
When a button is programmed as emergency, the emergency function can be activated.
When a button programmed as emergency is pressed over 2 seconds, the alert signal is repeatedly transmitted in normal mode. When a radio is in 5 tone setting mode, the alert is transmitted with 5 tones.

Fast Channel
Press a button programmed as Fast channel.
Rotate the selector to change channels.
Only channels programmed as Fast channel with ICON "F" is shown in the display.
This function is activated when some channels in the channel list are selected as Fast channel by programmer and a button is pre-programmed as fast channel setting.

Stun/Revive

```
STUN !
```

Stun status

When Stun/Revive function is programmed with SelCall ID, stunning a radio or reviving a radio can be activated by remote control.
When a radio programmed with Stun ID receives Stun ID from a control radio, all buttons and selectors of the programmed radio are locked. In this state, only PTT works for sending alert sounds.
Even if the power to the radio is reset it remains Stunned. The stun status is continued until it receives Revive ID.

Scramble/Descramble
This function is used for preventing eavesdropping and can only be utilized if this function is used on both the transmitting and receiving radios.

BCL/BCLO
This function is to limit sending signals to avoid interrupting others' communication when many radio users are on the same channel.
If PTT is pushed while receiving a signal, an alert sounds with message shown on the display.

Time Out Timer (TOT)
This function is to prohibit a radio from occupying one channel for a long period of time.
An alert sounds when the TOT timer expires. Transmit stops even if the PTT button is depressed.
A penalty timer is used to allow the unit to cool before transmission can be repeated.

2-Tone
When 2-tone is matched between caller and receiver in the status of programmed 2-tone, normal communication is performed.

Horn Alert
This function is to alert people away from vehicle through external speaker when certain calls are received.

Public Address
This function is to route sounds from microphone to an external speaker or similar external equipment.

Talk Around
When communication through repeaters is performed, this function is to allow communication among radios directly if a repeater is out of range or usage is not required.

5. Menu Description

To enter the menu, press and hold the channel selector knob for 2 seconds. The menu consists of 10 main menus along with 29 sub-menus. So, if the menu is set according to circumstance and purpose of use, the radio can be utilized conveniently. The main menu has a list such as SCAN, ID ANI, Message, Pro. Message, Utility, Vehicle, Sound/Tone, RPT/Talk Ad, GPS, Software Ver. and it is selected by the rotation of the right knob. To execute a function press the knob in.

| Scan | ↔ | ID ANI | ↔ | Status | ↔ | Utility | ↔ |
| Vehicle | ↔ | Sound/Tone | ↔ | Rptr/Talk Arnd | ↔ | Software Ver.# | ↔ |
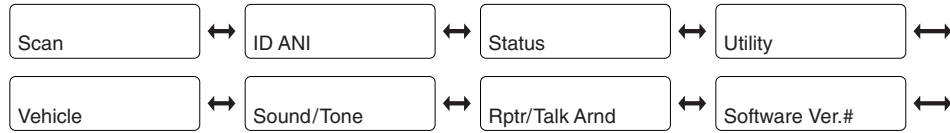
Main menu procedure

5.1 SCAN Setting
It has 3 sub-menus (List, Priority Use, and Priority List). The selection is made available by rotating the right knob and the activation is by pushing the knob.
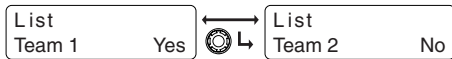
Scan List ↔ Scan Priority Use ↔ Scan Priority List ↔
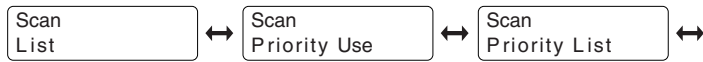
Scan sub-menu procedure

1) List
① The channel list of group and whether the channel is in the scan is displayed as Yes or No. To move among channels, rotate the right knob.

List Team 1 YES ⟳ List Team 2 YES
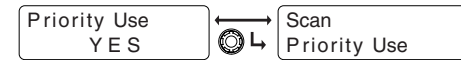
② Press the right knob to select Yes or No.

List Team 1 Yes ⟷ List Team 2 No

③ To go to upper rank, press the red button.

2) Priority Use
① Rotate the right selector knob to change Yes/No.

Priority Use YES ⟳ Priority Use NO

② Push the right selector knob to set, Back to upper menu.

Priority Use YES ⟷ Scan Priority Use

③ To go to upper menu, press the Red button.

3) Priority List
① The channel list in the group and whether the channel is set as priority is displayed as the sign of Yes or No. To change channel in the list, rotate the right knob.

Priority List Team 1 YES ⟳ Priority List Team 2 YES

② Rotate the right selector knob to change Yes/No.

Priority List Team 1 YES ⟷ Priority List Team 1 No

③ To go to upper menu, press the Red button.

5.2 ID ANI Setting
It has two kinds of sub-menu as DTMF & Selcall. With the right knob, select one of them. And set it by pushing the knob.
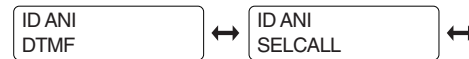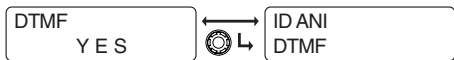
ID ANI DTMF ↔ ID ANI SELCALL ↔

1) DTMF

① Rotate the right selector knob to select Yes or No.

```
DTMF          [knob]    DTMF
        Y E S                     N  O
```

② Press the knob to set, back to upper rank.

```
DTMF          [knob]    ID ANI
        Y E S                 DTMF
```
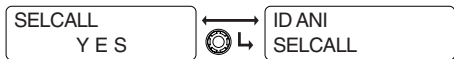
③ To move back to upper menu, press the red button.

2) SELCALL

① Rotate the right selector knob to select Yes or No.

```
SELCALL       [knob]    SELCALL
        Y E S                     N  O
```

② Press the knob to set, back to upper rank.

```
SELCALL       [knob]    ID ANI
        Y E S                 SELCALL
```

③ To move back to upper menu, press the red button.
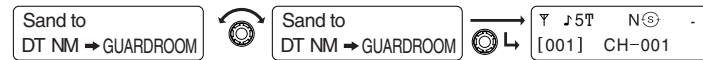
5.3 Status Setting

Consists of two modes similar to "Send" or "Receive Check"; Pre-programmed status is sent to the ID to the channel receiving. And the receiving message can be checked. (Refer to menu table).

1) Send

① Display pre-programmed Status. Rotate the right selector knob to select a status to be sent, press the right selector knob to set.
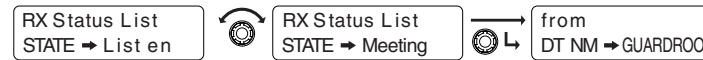
```
Status List   [knob]   Status List    [knob]   Send to
STATE ➡ Listen         STATE ➡ Meeting         DT NM ➡ GUARDROOM
```

② Rotate the right selector knob to select the ID which you wanted to send the status. And then press the right selector knob to set.

```
Sand to        [knob]   Sand to          [knob]   ♩♪5T   N⑤   -
DT NM ➡ GUARDROOM       DT NM ➡ GUARDROOM        [001]  CH-001
```

③ After automatically getting out of the menu, the radio sends the status, with the receiver's ID and a sender's ID orderly.

2) Receive Check

① Rotate the right selector knob to select the received status for reading. And then press the right selector knob know to check the sender's ID.

```
RX Status List  [knob]  RX Status List   [knob]  from
STATE ➡ Listen          STATE ➡ Meeting          DT NM ➡ GUARDROOM
```

② RTo remove the received status, press the "S" button.

```
RX Status List  [S]    RX Status List   [knob]  from
STATE ➡ Listen          Delete Status !          DT NM ➡ GUARDROOM
```

③ To erase all of the received status, press the "A" button and select Yes.

```
RX Status List  [A]    ALL DELETE ?    [knob]  
STATE ➡ Listen                   YES            Delete Status !
```

5.4 Utility Setting

There are six sub-menus (RF Power, Lone Worker, Scramble, LCD Contrast, Big Font, and Password). The selection is done by the right selector knob; press it to activate the function

```
Utility      ⟷   Utility       ⟷   Utility      ⟷
RF  Power         Lone  Worker      Scramble

Utility      ⟷   Utility       ⟷   Utility      ⟷
Lcd  Contrast    Big  Font         Password
```
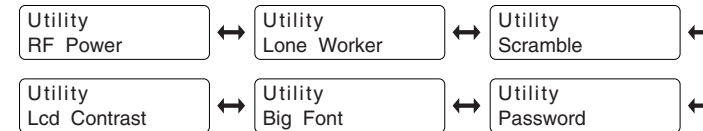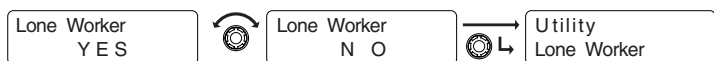
1) RF Power

① Rotate the right selector knob to select one of the 4 power levels. Then press the right selector knob to set.

```
RF  Power     [knob]   RF  Power      [knob]   Utility
        1                      2               RF  Power
```
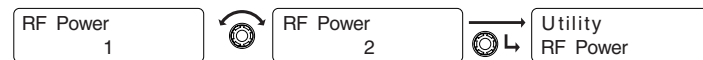
② To go back to the upper menu, press the Red button.

2) Lone Worker
① Rotate the right selector knob to select and press it to set.

Lone Worker		Lone Worker		Utility
YES	⟳	N O	⟳↳	Lone Worker

② To be back to upper menu, press the red button.

3) Scramble
① Rotate the right selector knob to select and press it to set.

Scramble		Scramble		Utility
YES	⟳	N O	⟳↳	Scramble
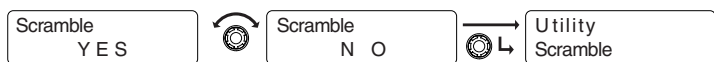
② To go back to upper menu, press the red button.

4) LCD Contrast
① Rotate the right selector knob to select one of 20 steps. Then press it to set.

| Lcd Contrast		Lcd Contrast		Utility
1	⟳	2	⟳↳	Lcd Contrast
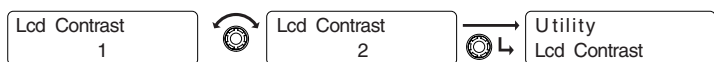
② To go back to upper menu, press the red button.

5) Big Font
① Rotate the right selector knob to select one of them such as "Name, Number, and Normal". Then press it to set.

Big Front		Big Front		Big Front
Normal	⟳	CHANNEL Name	⟳	CHANNEL Number

② To go back to upper menu, press the red button.

6) Passwordt
① When a Password is pre-programmed, "PASSWORD INPUT" is displayed on the LCD. Input the password by rotating the channel selector knob with a press to set the number. The 2nd set shows how to input a "NEW PASSWORD".

PASSWORD INPUT		PASSWORD INPUT		PASSWORD INPUT
1	⟳	2	⟳↳	★ 0

· · · · · ⟳↳

PASSWORD INPUT		NEW PASSWORD
★★★ 0	⟳↳²	0
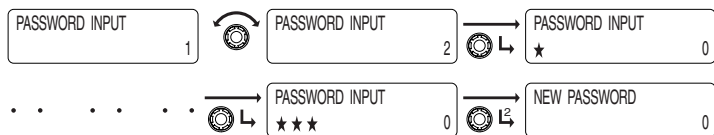
② When a password is not programmed, "NEW PASSWORD" is shown on the LCD. So, input new password.

NEW PASSWORD		NEW PASSWORD		NEW PASSWORD
1	⟳	2	⟳↳	★ 0

· · · · · · ⟳↳

NEW PASSWORD		CHECKED PASSWORD
★★★ 0	⟳↳²	0
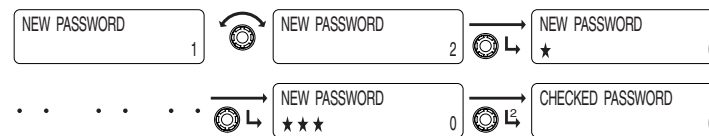
③ When "CHECKED PASSWORD" is shown, input new password once again.

CHECKED PASSWORD		CHECKED PASSWORD		CHECKED PASSWORD
1	⟳	2	⟳↳	★ 0

· · · · · · ⟳↳

CHECKED PASSWORD		SAVE PASSWORD
★★★ 0	⟳↳²	
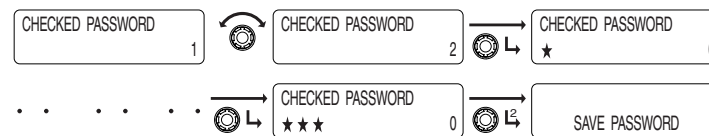
5.5 Vehicle Setting
It has two variations of Horn Alert, Public Address. Rotate the right selector knob to select one of them. Press the right selector knob to activate it.

Vehicle		Vehicle	
Horn Alert	⟷	Public AD	⟷

1) Horn Alert
① Rotate the right selector knob to select "Yes" and then press the right selector knob to activate it.

Horn Alert		Horn Alert		Vehicle
YES	⟳	N O	⟳↳	Horn Alert

② To go back to upper menu, press the red button.

2) Public AD
① Rotate the right selector knob to select "Yes" and then press the right selector knob to activate it.

Public AD		Public AD		Vehicle
YES	⟳	YES	⟳↳	Public AD

② To go back to upper menu, press the red button.

5.6 Sound/Tone

There are 7 kinds of sub-menu. (ID Sound, Compander, Key Tone, Speaker, Name Tone, MSG Tone, and Call Tone) The selection is made available by the right selector knob. The activation is by pressing the right selector knob.
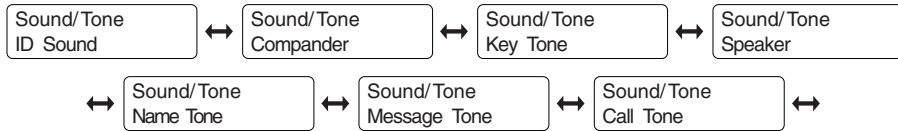
| Sound/Tone ID Sound | ↔ | Sound/Tone Compander | ↔ | Sound/Tone Key Tone | ↔ | Sound/Tone Speaker |

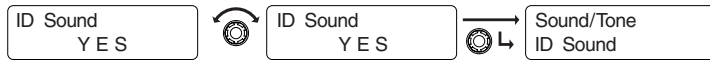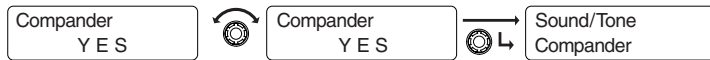| ↔ | Sound/Tone Name Tone | ↔ | Sound/Tone Message Tone | ↔ | Sound/Tone Call Tone | ↔ |

1) ID Sound

① Rotate the right selector knob to select "Yes" and then press the right selector knob to activate it.

| ID Sound   Y E S | ⟳ | ID Sound   Y E S | → | Sound/Tone ID Sound |

② To go back to upper menu, press the red button.

2) Compander

① Rotate the right selector knob to select "Yes" and then press the right selector knob to activate it.

| Compander   Y E S | ⟳ | Compander   Y E S | → | Sound/Tone Compander |

② To go back to upper menu, press the red button.

3) Key Tone

① Rotate the right selector knob to select "Yes" and then press the right selector knob to activate it.

| Key Tone   Y E S | ⟳ | Key Tone   Y E S | → | Sound/Tone Key Tone |

② To go back to upper menu, press the red button.

4) Speaker
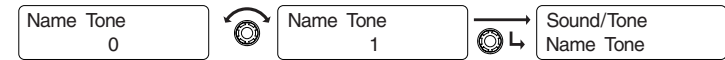
① Rotate the right select6 or knob to select one of them (Front, Back, or Both) and then press the right selector knob to activate it.

| Speaker   Front | ⟳ | Speaker   Black | ⟳ | Speaker   Both |

② To go back to upper menu, press the red button.

5) Name Tone

① Rotate the right selector knob to select preferred tone and then press the right selector knob to set.

| Name Tone   0 | ⟳ | Name Tone   1 | → | Sound/Tone Name Tone |

② To go back to upper menu, press the red button.

6) Message Tone

① Rotate the right selector knob to select preferred tone and then press the right selector knob to set.

| Message Tone   0 | ⟳ | Message Tone   1 | → | Sound/Tone Message Tone |
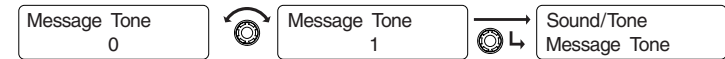
② To go back to upper menu, press the red button. .

7) Call Tone

① Rotate the right selector knob to select preferred tone and then press the right selector knob to set.

| Call Tone   0 | ⟳ | Call Tone   1 | → | Sound/Tone Call Tone |
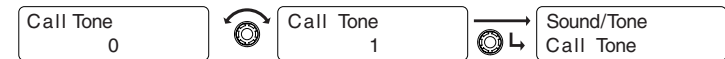
② To go back to upper menu, press the red button.

5.7 Repeater/Talk Around

It consists of 2 sub-menus for Repeater and Talk Around. The selection is made by rotating the right selector knob and then pressing the right selector knob to set.

| Rptr/Talk Arnd Repeater | ↔ | Rptr/Talk Arnd Talk Around | ↔ |

1) Repeater

① Rotate the right selector knob to select "Yes". And then press the right selector knob to activate it.

Repeater		Repeater		Rptr/Talk Arnd
Y E S		Y E S		Repeater

② To be back to upper menu, press the red button.

2) Talk Around

① Rotate the right selector knob to select "Yes". And then press the right selector knob to activate it.

Talk Around		Talk Around		Rptr/Talk Arnd
Y E S		Y E S		Talk Around

② To be back to upper menu, press the red button.

5.8 GPS Setting

It consists of 4 sub-menus; Method, Interval, Sync Slots, and Slot No. Selection is done by the rotating the right selector knob and then pressing the right selector knob to set.
To send your location data, you must first install a GPS unit onto the transceiver. Press the key programmed as send the GPS data to transmit your location data. Ask your dealer for details.

5.9 Software version

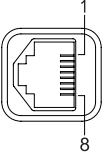Indicates the version of the Main & Front firmware:

F/W Version		F/W Version
Main Ver : ## . ##		Front Ver : ## . ##

6. Terminal Description

D-SUB 15 Pin Connector

Pin No	Pin Name	Description	Specification	I/O	Remark
1	DC+13.6V	DC Power Output	13.6 ±5%	O	
2	IGN	Ignition Signal Input	Power ON : ↑8V Power OFF : ↓6V	I	
3	EXT_SPK	Loudspeaker Output	4 Ω 4Watt	O	
4	AF_OUT	Audio Output	500mV	O	
5	EXT_MIC	Audio Input	5^{KΩ}	I	
6	TXD/FCN1	TX Serial Data	3.3V TTL	O	
7	RXD/FCN2	RX Serial Data	3.3V TTL	I	
8	FCN3	Programmable	High Impedance	I/O	
9	FCN4	Programmable	High Impedance	I/O	
10	FCN5	Programmable	High Impedance	I/O	
11	FCN6	Programmable	High Impedance	I/O	
12	DC+5V	DC Power Supply	DC+5V Max 100mA	O	
13	HR1	Horn Alert Signal Output	Max 3A	O	
14	HR2	Horn Alert Signal Output	Max 3A	O	
15	GND	Ground	Ground	-	

Microphone Jack

Pin No	Pin Name	Description	Specification	I/O	Remark
1	MBL	Backlight of Microphone	-	O	
2	DC+13.6V	DC Power Output	13.6 ±5%	O	
3	GND	Ground	Ground	-	
4	PTT/TXD0	PTT/PC Serial Data	3.3V TTL	I	
5	ME	MIC Ground	MIC Ground	-	
6	MIC	MIC Signal Input	600 Ω	I	
7	HOOK/RXD0	HOOK/PC Serial Data	3.3V TTL	I	
8	DM	MIC Data Detection	High Impedance	I/O	

Speaker Jack (3.5mm Phone Jack) 4Watt/4 Ω

Pin No	Pin Name	Description	Specification	I/O	Remark
1	SPO	External Speaker Output	4Watt/4 Ω	O	
2	GND	Ground	Ground	O	

DC Input Power Connector

Pin No	Pin Name	Description	Specification	I/O	Remark
Red	DC+13.6V	DC Power Output	13.6 ±5%	I	
Black	GND	Ground	Ground	I	

Antenna Connector

Pin No	Pin Name	Description	Specification	I/O	Remark
		PL-259			
		Impedance is 50			

7. Specifications

7.1 TM-8102 / TM-8104

General

Frequency Range — VHF: 136 ~ 174 MHz
Frequency Stability — ±1.5PPM (-30 to +60℃)
Programmable Channels — 256 Channels/32 Group
Channel Spacing — Dual Channel Spacing 12.5/25 kHz (12.5kHz USA)
Dimensions — 103mm (H) x 52mm (W) x 32mm (D)
Weight — 1.1Kg
Power Source — DC +13.6 ±5%
Current Drain (maximum) — Receive mode, rated audio out -1A (Audio Max)
Transmit mode -11A
Standby mode - 300mA

Receiver

Sensitivity — 0.25uV 12 dB SINAD
Squelch Sensitivity — 0.22uV 10dB SINAD
Selectivity — 70dB (12.5KHz), 70dB (25KHz)
Spurious and Harmonic Rejection — 75dB
FM Hum and Noise — 40dB (12.5KHz), 45dB (25KHz)
Audio Output Power — 4 Watt across an 8-ohm load
Audio Distortion — Less than 3% at rated output
Audio Response — +1, -3 dB from 6dB per octave de-emphasis Characteristic from 300 ~ 3000Hz
IF Frequencies — 21.4MHz and 455KHz
Input Impedance — 50 ohms

Transmitter

RF Power Output — 50/25/10/5Watt
Spurious and Harmonic — 70dB
FM Hum and Noise — 40dB (12.5KHz), 45dB (25KHz)
Audio Distortion — 3% maximum with 1KHz modulation
Audio Frequency Response — +1, -3dB from 6dB per octave pre-emphasis Characteristic from 300 ~ 3000Hz
Output Impedance — 50ohms

7.2 TM-8402 / TM-8404

General

Frequency Range	TM-8402A / TM-8404A : 400 ~ 475 MHz
	TM-8402B / TM-8404B : 450 ~ 520 MHz
Frequency Stability	±.5PPM (-30 to +60℃)
Programmable Channels	256 Channels / 32 Group
Channel Spacing	Dual Channel Spacing 12.5/25 kHz (12.5kHz USA)
Dimensions	103mm (H) x 52mm (W) x 32mm (D)
Weight	1.1 Kg
Power Source	DC +13.6 ±15%
Current Drain (maximum)	Receive mode, rated audio out - 1A(Audio Max)
	Transmit mode - 11A
	Standby mode - 300mA

Receiver

Sensitivity	0.25uV 12 dB SINAD
Squelch Sensitivity	0.22uV 10dB SINAD
Selectivity	70dB (12.5KHz), 70dB (25KHz)
Spurious and Harmonic Rejection	75dB
FM Hum and Noise	40dB (12.5KHz), 45dB (25KHz)
Audio Output Power	1 Watt across an 16-ohm load
Audio Distortion	Less than 3% at rated output
Audio Response	+1, -3 dB from 6dB per octave de-emphasis Characteristic
	from 300 ~ 3000Hz
IF Frequencies	45.3MHz and 455KHz
Input Impedance	50 ohms

Transmitter

RF Power Output	40/25/10/5Watt
Spurious and Harmonic	70dB
FM Hum and Noise	40dB (12.5KHz), 45dB (25KHz)
Audio Distortion	3% maximum with 1KHz modulation
Audio Frequency Response	+1, -3dB from 6dB per octave pre-emphasis Characteristic
	from 300 ~ 3000Hz
Output Impedance	50 ohms

8. Warranty Statement

TecNet International, Inc. offers to the original enduser:

Three(3) Year Limited Warranty on New Maxon, HeadLine, and TecNet Radio Products.

A Three Year Warranty is effective on radios purchased after January 1, 2010. Radios purchased previous to the January 1. 2010 date are covered under all other applicable terms expressed here for a period of Two Years.

EXCLUSION: The Three Year Warranty specifically excludes Max on model radios in the series SP-200, SP-300, SM-2500, SM-6000, SD-125, SD-160/170, and HeadLine models HL-1510/1520, HL-1210/1220. These excuded models are still warranted under all other applicable term sexpressed here and as originally expressed for a period of Two Years from date purchase.

One(1) Year Limited Warranty on LMR Radio Accessories, GPS Receivers, and Bluetooth devices.

TecNet warrants each new radio product manufactured or supplied by it to be free from defects in material and workmanship under normal use and service for the time period stated, provided that the user has complied with the requirements stated herein. The warranty period begins on the date of purchase from an Authorized TecNet Dealer. This warranty is not assignable or transferable. This warranty is void if the product serial number is altered, defaced or removed. TecNet is not responsible for any equipment that is attached to or used in conjunction with the Maxon and HeadLine products.

During the warranty period, if the product fails to function under normal use, because of manufacturing defects or workmanship, it should be returned to the Authorized TecNet Dealer from which it was purchased.
The Authorized TecNet Dealer will repair the product or returm the product for repair to TecNet or its Authorized Repair Depot. The user is responsible for the removal of the product from a vehicle or any equipment attached to it, or other site of its use, transportation of the producr to the Authorized TecNet Dealer, for the return of the repaired or replacement product to the site of its use and for the reinstallation of the product.

TecNet shall have no obligation to make repairs or replacement of product which results from normal wear and tear, or is necessitated by catastrophe, fault, or negligence of the user, improper or unauthorized alterations or repairs to the product, incorrect wiring, use for which it was not designed or by causes external to the product. TecNet's sole obligation shall be to replace or repair the product covered by warranty.

Replacement is done at TecNet's discretion and may consist of a similar or higher featured product. Repair may include the replacement of parts with functionally equivalent new or reconditioned parts. All replaced parts and acessories are warranted for the balance of the original time period. All parts and accessories that are replaced become the property of TecNet International Inc.

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