User Manual

UHF Transceiver

TPD-8424

1. TPD-8424 Series Main Features

The TPD-8424 Digital Radio was developed by Yeonhwa M Tech Co., Ltd. to be user-friendly and compact design, to have various features and to use at the construction / industrial / commercial / public areas for the safety & convenience of users.

It provides better communication distance, audio quality and volume, duration of use through digitalization than Analog radio.

The followings are the main features of the TPD-8424 Series Radio.

- 16 Zones and 32 Channels are selectable. (1zone = Max 32 Channels)
- 512 CH can be set.
- English and Korean setting function.
- RF Power setting function.
- Short (up to 40 characters) message sending and reception functions.
- Encryption mode 16 bit (encryption key Range 0~65535)
- Lone Worker mode
- Normal scan
- 5-step VOX (Voice Operated Transmit) can be set
- BCL / BCLO function
- Time-Out Timer (TOT) function
- Emergency / Siren function
- Built in Flash Lamp
- Etiquette (Vibration) function
- Voice recording and playback(Recorder quantity : 63, 1 Recorder : 2minute 30second)
- Automatic analog/digital mode detection in receiver mode
- 5-step S.Q can be set (Analog Analog support).
- Remote Radio Stun / Kill / Revive
- Speaker volume of 1 Watt
- 3Lines Mono LCD Display
- Aluminum metal Frame Body
- Adopt DC+3.7V 2,000mAH high capacity Battery

2. Specification

2.1 TPD-8424

General

Frequency Range	A : 410 ~ 450 MHz, B : 440~470MHz
Frequency Stability	±1ppm (-30 to +60℃)
Programmable Channels	16 Zones / 32 Channels
Channel Spacing	12.5KHz
Digital Vocoder	AMBE++
Dimensions	99mm(H) x 51mm(W) x 21mm(D)
Weight	160g
Power Source	DC +3.7V Li-ion 2,000mAH Battery
Current Drain (maximum)	Receive mode, rated audio out – 320 (Audio Max)
	Transmit mode – 1,800mA
	Standby mode – 120mA

Receiver

Sensitivity	0.25uV 12 dB SINAD
Squelch Sensitivity	0.22uV 10dB SINAD
Selectivity	65dB (12.5KHz)
Spurious and Harmonic Rejection	70dB
FM Hum and Noise	40dB (12.5KHz)
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
Input Impedance	50 ohms

Transmitter

RF Power Output	3Watt
Spurious and Harmonic	70dB
FM Hum and Noise	40dB (12.5KHz)
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
Duty Cycle	50 %

3. Checking items in the package

● **Components could be changed by buyer request.**

Radio unit	Battery	1 slot charger	Antenna

Belt clip	Hand strap(option)	User manual

Figure 3-1) TPD-8424 series main items

TPD-8424BK : Block Case

TPD-8424BE : Blue Case

TPD-8424OR : Orange Case

TAD-800L : Single Slot Desktop Charger

TAD-800USB : USB Charging Cord Only

TAD-8200 : 2,000mAH Li-ion battery pack

TAD-818X : Ear Speaker

3.1 Appearance of TPD-8424 Series Radio

Figure 3-2) Appearance of TPD-8424 Series Radio
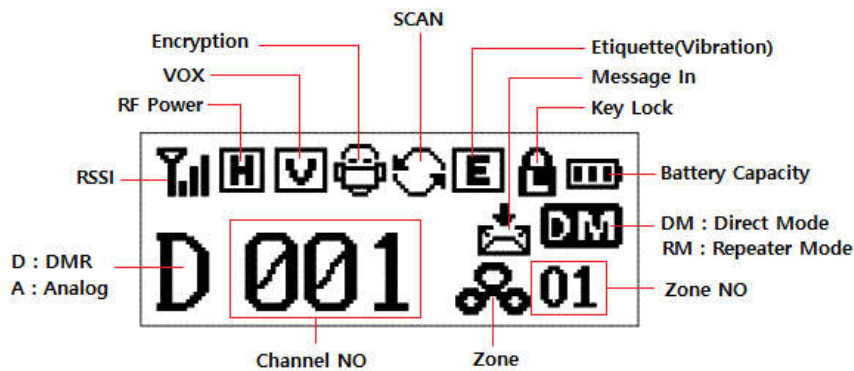
Figure 3-3) LCD Indication of TPD-8424 Series Radio

4.1 Basic Button Operations

Button	Operation Description
Power ON/OFF	Press and hold the power button for 2 seconds, the device power is turned ON. When you press the power button for 2 seconds during use, the power is OFF.
Volume/Menu+/- Button	+/- Button can adjust the call sound by using, and if you press the [+] button, the sound will be increases if you press the [-] button, the sound will be smaller. In the menu, you can move to the menu item.
Up/Down Button	You can change the settings of the Channel that have been set. You can enter 32 Channel per the call zone (Zone). In the progress of the menu, you can move the menu item.
Zone Button	You can change the order of the call zone that you set.
Menu/OK Button	The button to enter the menu. When you enter the menu, you can make a choice of each item.
Cancel/Return Button	Using the Button, it will return to the menu on the one stage. In the menu setting screen, and run the cancellation of the function.
P1, P2, P3 Button	When operating in the Short Key, it is a Programmable Key. When operating in Long Key (press for longer than 2 seconds); - P1 is the unlocking button against lock function. - P2 is Flash On / Off - P3 is Etiquette On / Off
Contact List Button	The button can be entered directly on the Contact List. By entering the Contact List you can proceed with individual calls, group calls, total calls.

4. Basic operation

Please fully read the instruction manual before use.

This manual provides important information related to radio operation.

4.1 Antenna installation and removal

To install the antenna, insert the antenna into antenna connector and screw the antenna clockwise.

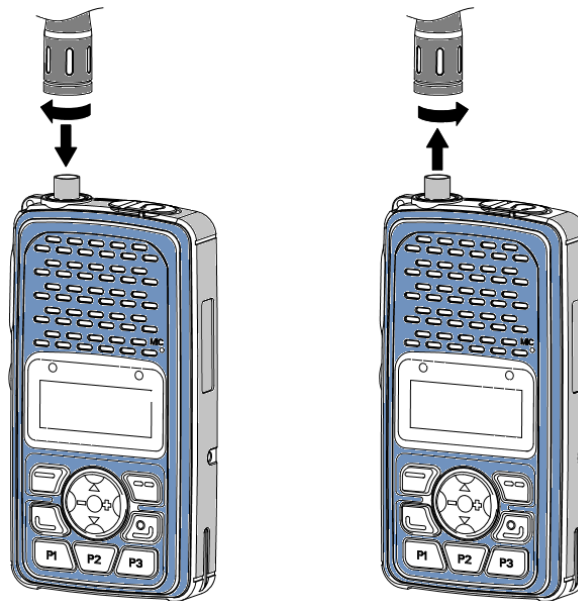To remove the antenna, screw the antenna counter clockwise.

Figure 4-1) Antenna installation and removal

⚠ Caution	When installation of the antenna, giving a strong pressure to the Radio or pulling the antenna with a strong power from the Radio can make damage on the antenna connector, which may cause the Radio to have a critical problem.

4.2 Battery installation and removal

Removal of the battery is shown in Figure 4-2.

Slide the rear cover in the direction of the top and open the cover. And then remove the battery.

Slide and hold down, the battery is inserted. Insert the back cover to the below hole and press the cover as shown in Figure 4-3. Then the cover will be equipped.
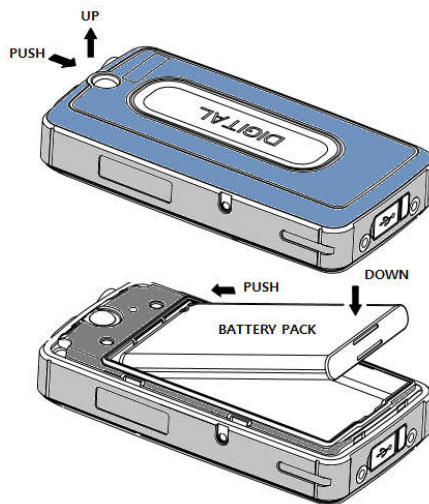
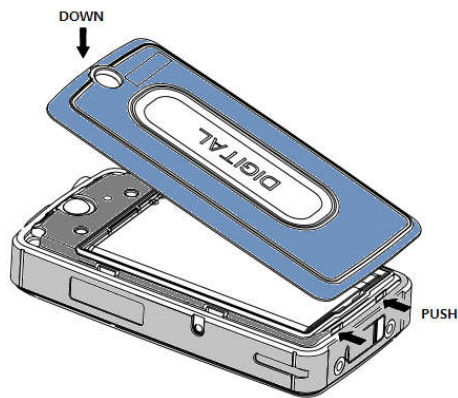Figure 4-2) Battery installation and removal

Figure 4-3) Rear cover mounting

4.3 Belt clip installation and removal

Put the belt clip to belt clip's hole of the radio and tighten the screws as shown in figure 4-4.

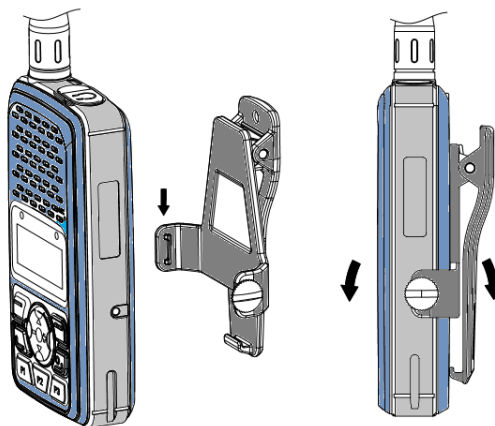Conversely loosen the screws, the belt clip is separated with radio.

Figure 4-4) Belt clip installation and removal

4.4 External accessory connection

Align the body with accessory hole and push and tighten the screws as shown figure 4-5.

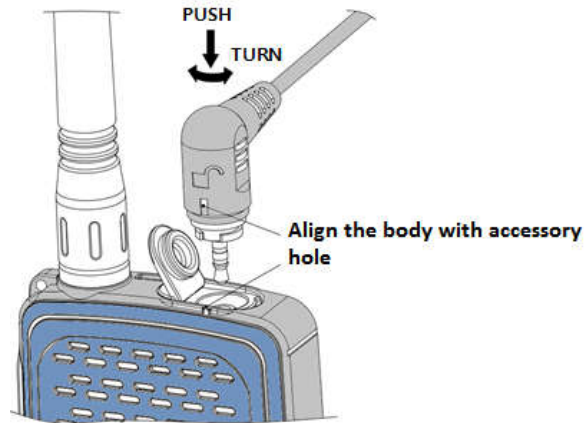To remove the accessory, loosen the screw and pull out.

Figure 4-5) External accessory connection

4.5 Charging USB

Open the USB cover and connect the micro USB charging adaptor. And the LED will turn on the red color. When charging is completed, the charging LED will turn green.
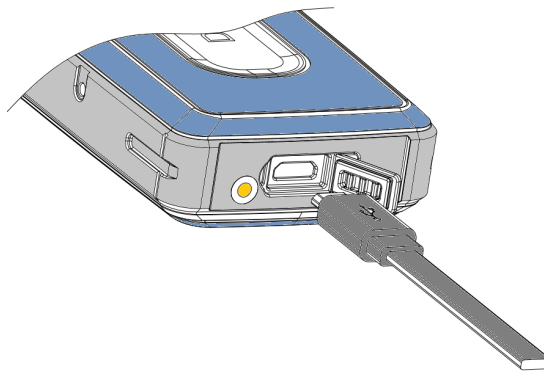

Figure 4-6) Charging USB

5. Radio operation

The definition of the various buttons of the TPD-8424 series is the same as Figure 5-1).
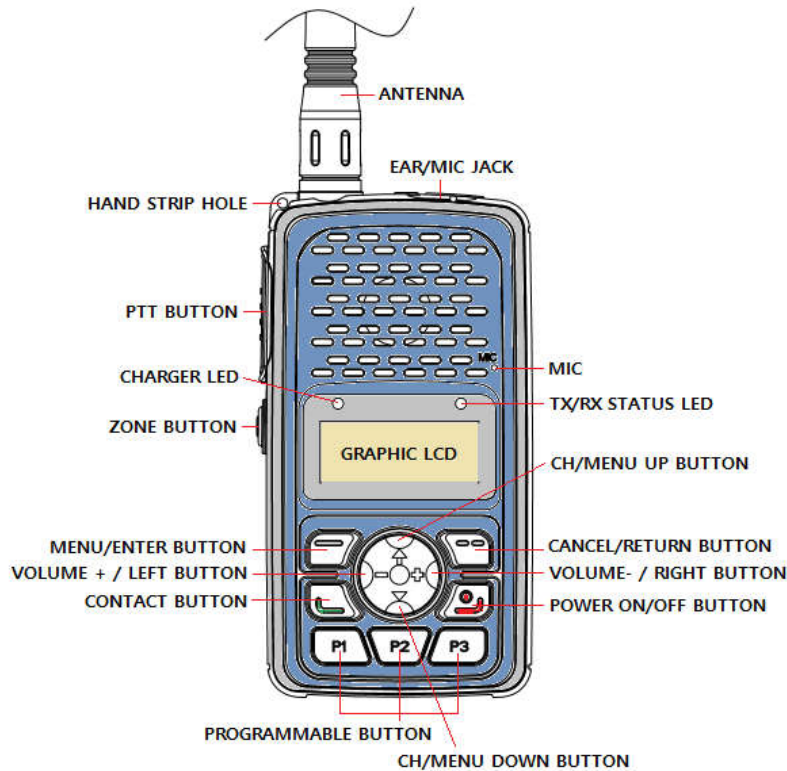

Figure 5-1) TPD-8424 Series button definition

5.1 Power ON/OFF Button

When the power ON / OFF button pressed for more than 3 seconds, start-up sound occurs with company logo and the radio turns ON. Push again power ON/OFF button while the radio power is ON, the power is OFF with "Good bye" sound.

5.2 PTT Button

Pressing PTT button, the radio mode is transmission and releasing the button, it is receiving mode. It is recommended to talk 5~10cm away from the microphone for the best voice communication.

5.3 ZONE Button (Program settings)

When you press the ZONE button, the registered ZONE which registered by program is changed to a step-by-step and can be select your request channel use by UP / DOWN buttons.

5.4 MENU/ENTER Button

When you press the NENU / ENTER button, currently programmed menu is displayed and you can select a desired menu using by VOLUME + / LEFT button or VOLUME- / RIGHT button.
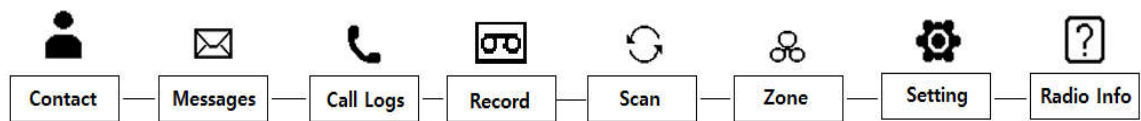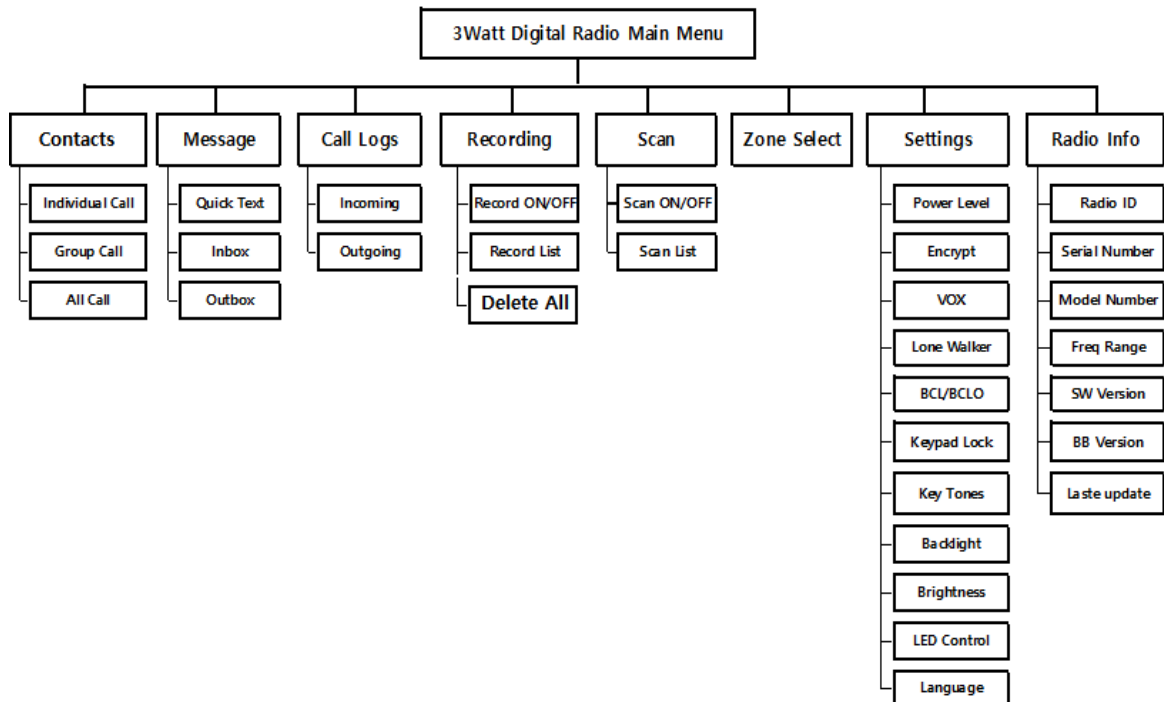
Figure 5-2) TPD-8424 Series Menu

Figure 5-3) TPD-8424 Series Menu Tree

5.5 Volume Button

The size of volume is a total 16 steps.

Push button of " Volume – ", the sound getting smaller. And push button of " Volume + ", the sound getting bigger. When you push Short key, increased or decreased by one step, push and hold Long key, the sound immediately increase or decrease. In the menu operation mode, you can use Left Button and Right button.

5.6 CH/Menu UP/Down Button

" CH / MENU UP" and   "CH / MENU Down" are to change channels and in the menu entry mode, it is select the UP / Down of the Menu.

5.7 Contact Button

When you push contact button, to go directly to the phonebook menu.

5.8 P1, P2, P3 Programmable Button

If you push the P button for more than 2 seconds, the P button has two functions of Short Key and Long Key. The Short Key is set by PC program and Long Key is defined in the body.

If the key input is not 10 seconds, it will be automatically set Key Lock.

If you want to disable the Key Lock function, it is cancelled by pressing the P1 key for more than 2 seconds (Long Key function) and you can use all of the Key.

If the key input is not 10 seconds again, it will be automatically set Key Lock.

If you want to completely release the Key Lock function, you have to OFF the function at the Key Lock Menu.

P Key	Short Key	Long Key
P1	Programmable	Key Lock ON/OFF
P2	Programmable	Flash Light ON/OFF
P3	Programmable	Vibration mode ON/OFF

5.9 EAR/MIC Jack

This jack is used to connect external speaker Mic, and headset, etc.

5.10 Micro USB Jack

 Features of the micro-USB jack: 1) charging 2) PC Program Function 3) Radio Firmware UP function.

5.11 LED indication Status

This LED displays the operating status of the device. The main condition inscription is as follows.

  ① TX : Red Lamp.

  ② RX : Green Lamp.

  ③ Green blinks: when the frequency is the same but the color code does not match.

  ④ Low Battery: Red Lamp blinks with "beep" sound.

5.12 Charging status LED.

The LED indicates the battery charge.

6. Charging the Battery

6.1 Safety Notes

1) The radio of TPD-8424 series receives power from high-performance Li-ion battery (TAD-8200).

TAD-8200 Battery is safe of high performance and highly reliable, and could be charged very fast.

⚠️ Caution	The charging of the enclosed Radio on the other maker's charger will cause damage on the battery and also, will cause a trouble on the Radio.

2) Please charge the battery before using the radio for best performance and safety.

3) When you charge the battery that is installed in the Radio, please turn off the radio first to charge the battery.

⚠️ Caution	The continuous rapid discharge (for example, when making a short circuit on the '+' terminal of battery by a metal substance) may make a fatal defect and the battery can be exploded. Also, it can cause a fire.

6.2 Charging time

Low battery voltage maybe cause to reduce communication coverage and also make the performance worse. Please charge the battery in case of following:

1) When you think that the performance of the radio has degradation.
2) The red lamp on RX/TX LED blinks. (every 0.5 second), during transmission or reception.
3) When the battery icon is blinks
4) While the radio is in use, "beep" sounds.

Figure 6-1) Battery charging

6.3 How to charge

1) Plug the adapter of the TAD-800L charger in general power AC220V power outlet.

2) When charging the battery that is equipped with radio, please turn off the power of the Radio and plug the Radio in the charger.

3) Even if charging is completed (green lamp lights), please charge more for about 30 minutes for a full charge.

Status	LED indication	Status	LED indication
Charging	Red LED lights	Detecting error	Red LED is flicker
Complete charging	Green LED lights	Keep charging	Green LED lights

7. Using the TPD-8424 Series
7.1 Menu description

Press the [icon] button on the front to enter the menu mode. In the menu mode, there are eight of the main menus, and set and used according to the application and the environment, it can be more convenient to use.
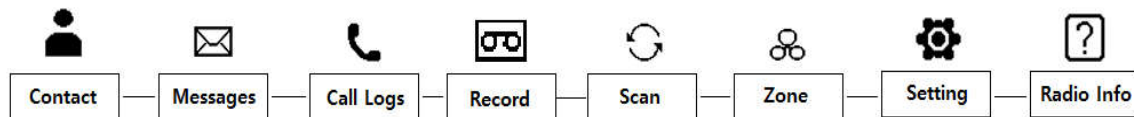

Figure 7-1) TPD-8424 Menu

☞ Note) If the menu is not operated for at least 25 seconds after launch, the menu mode is automatically end and it is switch to receive mode.

7.1.1 Contact List

Set a contact list (set to CPS program) and will be pressing the PTT button to call. If you want to call with another registered contact, after you select a contact from the contact list and press the PTT button, it will be the call. The list of contacts in the menus can be registered / deleted using the CPS (Customer Programing Software) program.

When you enter in the contact menu, the individual, group and All Call contact list is displayed.

- ICON
  - [icon] : Individual Contact List (individual Call , Sending individual message)
  - [icon] : Group Contact List (Group Call , Sending group message)
  - [icon] : All Contact List (All call, Sending Message to terminal which has same channel and same color)

7.1.2 Message

When a new message arrives, the contents will be display on LCD in receive mode.

And if you are in other mode, it will be seen in the ICON form when a new message arrives.

Message menu has a simple message, inbox, outbox, three kinds of menu.

1) Simple Message

Using the CPS program can create a total of 10 messages and
One message can be edit up to 40 characters.
If you select a simple message menu you can view the registered message.

Select the message you want to send, and press the button, you can see the contents

of the message. When you press the button again, the message will be sent to the registered terminal.

2) Inbox

It is possible to store up to 10 incoming messages.

When you choose contents stored in the list, you can see the received messages.

When the received message is more than 10, the earliest incoming message is cleared first and it is registered.

If you want to delete incoming messages, it can be deleted by selecting delete all menu.

3) Outbox

It is possible to store up to 10 outgoing messages.

When you choose contents stored in the list, you can see the outgoing messages.

When the outgoing message is more than 10, the earliest outgoing message is cleared first and it is registered.

If you want to delete outgoing messages, it can be deleted by selecting delete all menu

7.1.3 Call Log

This is the menu to save only individual call log.

Group and All call logs do not save. The message content is managed in the in/outbox messages.

1) Inbox

It is possible to store up to 10 inbox record and it can see the opponent ID.

When the inbox is more than 10, the earliest inbox record is cleared first and it is registered.

If you want to delete inbox record it can be deleted by selecting delete all menu.

2) Outbox

It is possible to store up to 10 outbox record and it can see the opponent ID.

When outbox is more than 10, the earliest outbox record is cleared first and it is registered.

If you want to delete outbox record it can be deleted by selecting delete all menu.

7.1.4 Call Recording

This function is used to save the outgoing and incoming calls content. If the recorded content is

not required, it can be completely deleted.

Calls list can store up to 63 and one call list will be limited to 2 minutes and 30 seconds.

If you want to use the call recording function, you can select in the settings.

⚠️ **Caution**	. In the encrypt feature, only the contents that have been encrypted calls can hear the normal recording contents but content that has not been encrypted calls will not be able to hear.

7.1.5 Scan

When turning ON the scan operation, to start the scan in the order of the channel that has been set in the scan list. If there is a channel used during the scan, you will receive the contents stops at that channel.

If you want to call, you can use the settings to suit your needs by the CPS program.

1) Scan ON/OFF

   Select the scan settings or scan release at the scan of menu and go to receive mode..

2) Scan list

   Scan list can be set using the CPS program.

7.1.6 ZONE

ZONE can create up to 16 and it can be registered to 32 channels per ZONE.

How to specify the ZONE is to use the CPS program.

7.1.7 Setting

This is the menu to set various functions of the radio.

The settings are transmission power, voice encryption, VOX, Lone walker, BCL / BLCO, Keypad lock, Sounds, Backlight, Contrast, LED settings, and Language.

1. Transmission power

   Set the high and low of the transmission power.

2. Voice Encryption

   This is a feature to encrypt the incoming and outgoing voice. Voice Encryption function can be set for each channel from all of the digital channels.

   The setting of voice encryption code is using the CPS program, the total number of encryption can be set from 0 to 65535.

3. VOX

   VOX function is transmitted by detecting a voice level without using the PTT button

   VOX sensitivity level is 1 - 5 steps, you can set using the CPS program.

4. Lone walker

It is function to inform others about your safety within the time set in the menu.

Setting time supports up to 1-100 minutes..

5. BCL/BCLO

If the another user on the currently used channel, it is the ability to limit the transmission so as not to interfere..

BCL: If the current channel is busy, the transmission prohibition

BCLO: The ability to send regardless of the user of the current channel

6. Button Lock

With the exception of the minimum of buttons necessary for the user to prevent unwanted terminal operation, it is the ability to limit the operation.

When the button lock is on, all buttons are locked except the PTT button, the emergency button and power ON / OFF button.

When press the **P1** key (button lock temporary release key) for 2 seconds, you can use a button. After 25 seconds from you pressing the last button, to return to the button again locked.

7. Sound

This is a sound setting function. The main menu is available only ON / OFF.

The detailed sound can be set using the CPS program.

8. LCD BACKLIGHT

This feature is LCD backlight ON / OFF.

9. LCD Contrast

The function is to adjust the brightness. The brightness can be set from 1 to 7 step.

10. LED Status display setting.

The feature is to set the LED status display. It can be set detailed using the CPS program.

11. Language

The feature is to select the language for the menus.

7.1.8 Radio Information

A menu that shows the information in this device..

8. Precautions

8.1 Matters affecting the performance of the equipment.

WARNING	Don't remove the antenna from the Radio or don't transform the antenna or don't make any change on the antenna. The strong electronic wave to be emitted from the Radio can have an effect on the performance of the Radio and can cause the Radio to have a defect.
WARNING	Don't disassemble or reorganize the Radio. The disassembly or reorganization will be causes of defect or malfunction and it will be impossible to make repair afterward. Also, a punishment can be made by law.
WARNING	Don't use the other frequency except for the permitted frequency in order not to be punished by law.

Caution	• Don't give an excessive shock to the Radio. • Don't place the Radio where the direct sunlight and/or the high temperature occurs. • If the Radio is placed for a long time in car in summer, the hot temperature in the car may cause an explosion of battery. • Don't make a damage to the battery by a sharp substance and/or an excessive shock.

9.2 Influences to the operations of Radio or other Equipments.

The Radio emits a strong electronic wave, which may have an effect on the operation of other equipments and also, can be influenced by the other devices.

WARNING	Please turn off the Radio before boarding on airplane. When you want to use the Radio in the airplane, please follow the rules in the airplane or the instructions by crew.

WARNING	In case of the area that medical equipments are being used, please use the Radio after discussion with the equipment maker or the related doctor.

Caution	Please don't use the Radio at the place where computer or the other electric/electronic devices are being used, because the strong electronic wave from the Radio can have an effect on the equipments.

10. Safety Notes

Please make sure to read the followings for safe and effective use of the Radio.

WARNING	• Please keep the Radio away at least 1inch from the body. • If the outside surface of antenna gets stripped out, it can make a burn on the skin. • If you contact a conductive metal to battery terminal, a heat can be made and it may cause fire, explosion and burn. Especially, please be careful when putting the battery in a pocket or a bag. • When using an earphone, please don't listen to the sound at a high level. The high sound may have a bad effect on your ear. • After setting the volume of the Radio at a low level, please adjust the volume step by step to the level you want. A sudden high sound may give a bad damage to the ear or the heart. • Please don't remove or replace or charge or discharge the battery at a dangerous area, since it may cause an explosion or a fire by an electrical spark. • At the area where an electromagnetic force can be made, please make sure to turn off the power of the Radio.

10.1 Inportant Safety Information

	• Before using the radio, read the RF Energy Exposure and Product Safety Guide for Portable Two-Way Radios which contains important operating instructions for safe usage and RF energy awareness and control for Compliance with applicable standards and Regulations. For a list of YEONHWA M TECH-approved antennas, batteries, visit the following website: http://www.xradio.co.kr/ Any modification to this device, not expressly authorized by YEONHWA M TECH, may void the user's authority to operate this device. Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication. This radio transmitter has been approved by Industry Canada to operate with YEONHWA M TECH-approved antenna with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Warranty Card

Thank you for purchasing TPD-8424 Series.

1. This product has passed strict quality control and testing process.
2. Warranty is one year from the day the factory.
   • Failure of the product under normal operating conditions, during the warranty period
     may be repaired by Yeonhwa M Tech Co., Ltd. or our authorized service organization
     free of charge.
3. For the following cases, some service fees will be charged.
   • It occurs after the warranty period has passed, performance failure, malfunction or
     damage.
   • When the product is damaged due to user's mishandling, abuse or
     improper operation.
   • When the product is damaged due to user's modification, attempted repair
     or otherwise access to sealed/non-user serviceable items.
   • When the product is damaged due to fires, pollution, earthquakes and any other natual
     or unnatural conditions, accidents, etc.
4. Product check list

Model No.		TPD-8424
Serial No.		
Purchase date		
Purchaser	Name	
	Address	

 ※ When you purchasing, please fill out this check list.

YEONHWA M Tech Co., ltd.

430-857 36, Jeonpa - ro, 44 Beon Gil, Manan-gu, Anayang - city, Gyeonggi-do, Korea.

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