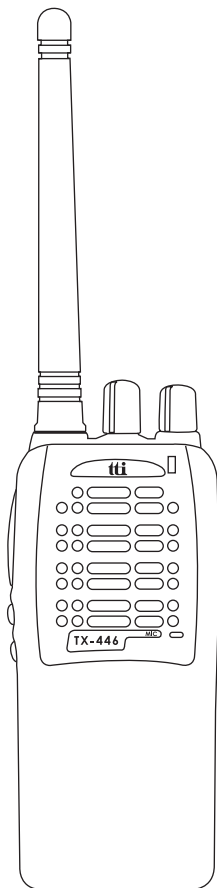


# — Instruction Manual —

**tti** Tech

Private Mobile Radio (PMR)446MHz

**Model: TX-446**



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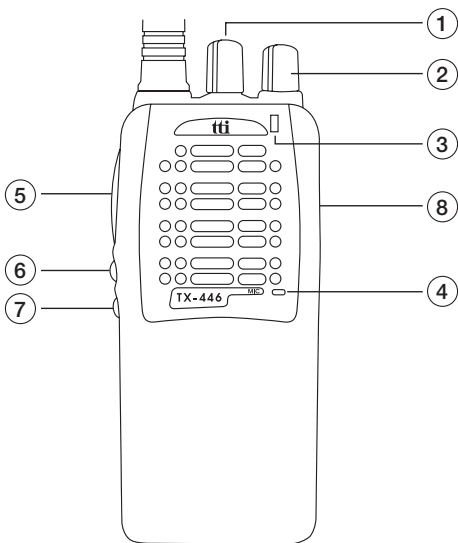
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## 1. Introduction



### Transceiver Details

#### 1. Channel Selection Knob

This knob is used to select a channel.

#### 2. Power/Volume Knob

This knob is used to turn the radio on or off, and to increase or decrease the volume.

#### 3. LED Indicator

This LED indicates radio status.

LED color	Indication
Continuous <b>"RED"</b> lighting	TX
Continuous <b>"GREEN"</b> lighting	RX
<b>"GREEN"</b> flashing	<b>"GREEN"</b> flashing
Continuous <b>"ORANGE"</b> lighting	RX with CTCSS or DCS code matched

#### 4. *Microphone*

Hold the radio upright and speak to the microphone clearly and slowly.

#### 5. *PTT (Push-to-Talk) Button*

Hold the radio as you speak into the built-in microphone.

After you have finished speaking, release the PTT button to get back to the receiving mode.

#### 6. *Side Button 1 (Programmable)*

#### 7. *Side Button 2 (Programmable)*

There are two side buttons in your radio and various features can be programmed and assigned to each key by your dealer.

Please contact your dealer to know which features are programmed and assigned for your side buttons.

The following describes how to press the side buttons:

- **SHORT:** click the button momentarily then release it.
- **LONG:** press the button for a long time then release it.
- **HOLD:** hold down the button to check the status of radio or adjust the radio's parameter.

You may operate the side buttons by pressing **SHORT** or **LONG** to activate one of the features.

Button Function	SHORT/LONG	HOLD
Monitor	–	Monitor is activated on your selected channel
Scan	To start scanning from a current channel or to quit scanning	–
Delete a Nuisance Channel	Wenn scanning, you can temporarily remove an unwanted channel from the scan list	–
Repeater/ Talk-around	To use a repeater function or to allow communications directly with other parties without using a repeater	–
Squelch	To set the squelch level between normal and tight	–
Call	To page radios	–



## 8. Accessory Connector Cap

To access your accessory connector, remove the protection cover by removing the retaining screw.

### Beep

1. Power on and self test success beep
2. Power on and self test failure beep
3. VOX power on beep (High Sensitivity)
4. VOX Power on beep (Low Sensitivity)
5. Positive beep
6. Negative beep



Note:  mark means high voice beep.  
 mark means low voice beep

**Beep for side button**

Some beeps of the programmed **side buttons** are programmable, which means the features are programmable.

Side Button Features	Positive Beep	Negative Beep
Scan	Start scanning	Quits scanning
Squelch	Tight squelch	Normal squelch
Repeater/Talk-around	Without using a repeater	Using a repeater

## 2. Getting Started

**Battery Information**

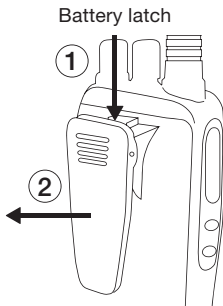
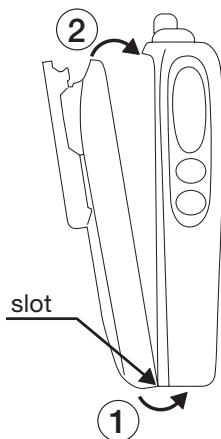
To maximize the battery life and performance, and to ensure the highest performance and longest life cycle, you should properly use the battery pack in accordance with following simple rules:

- If you use a non-TTI supplied charger, the battery might be damaged.
- Turn off the radio when charging the battery.
- A room temperature of 25°C is desirable to store and charge the battery.
- Do not charge a cold battery at around 10°C or below. This will make the battery inefficient.
- Do not charge a hot battery at above 35°C. This will reduce the life cycle of battery.
- A new battery can be stored up to two years with no harmful effect to the life cycle of the battery if stored at a cool and dry place.
- Do not charge a fully-charged battery to get an **extra boost**. This will significantly reduce its life cycle.
- Our batteries and chargers have been designed to be

operated as an integrated energy system. So, to get an optimum performance of the battery, you should use TTI-supplied charger only.

### **Installing Battery Pack**

1. Put the battery pack onto the bottom of the Radio.
2. Place the battery pack into the upper edge area of the Radio, then push the battery pack gently until you hear a '**click**' sound.



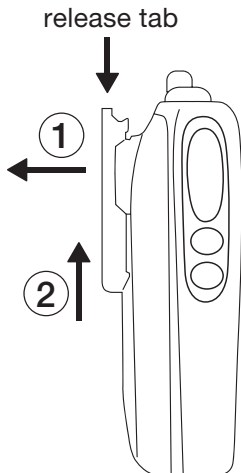
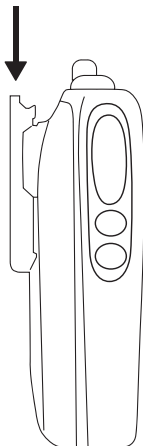
### **Removing Battery Pack**

Before removing the battery pack, you must turn off the Radio.

1. Press down the battery latch.
2. And separate the battery pack from the upper area.

### **Attaching Belt Clip**

1. Align the mounting rail of the radio with the groove of belt clip and slide the belt clip downwards until it sounds **'click.'**

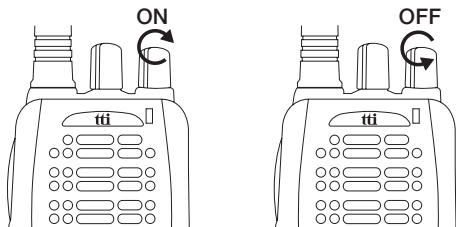


### **Removing Belt Clip**

1. Press down the release tab.
2. And slide the belt clip upwards.



### 3. Basic Operation



#### *Switching Power On/Off*

- To turn on the radio, turn the power/volume knob clockwise. You will be able to see a green and red light on the LED cap with a beep. After the beep, the red light goes off.
- If the beep sounds high and short, a Self-Test succeeded, and the Self-Test failed, if the beep sounds low and long.
- To turn off the radio, turn the power/volume knob anti-clockwise until there sounds a 'click'.

#### *Adjusting Volume*

- Hold down the monitor button to hear background noise.
- Adjust the volume by turning the power/volume knob to the right or left with the monitor button being pressed.
- To increase the volume, turn the knob to the right and to reduce the volume, turn the knob to the left.
- Release the monitor button.

#### *Selecting a Channel*

Choose a channel you want by rotating the channel selection knob.

*Note: Please, check if your radio is programmed with the channel selection function. For more details, you may ask your dealer.*

### **Transmitting a Message**

1. Turn on the radio.
2. Select a channel.
3. Press and hold down the PTT button, and speak clearly to the microphone from a distance of around 2.5~5cm.  
Release the **PTT button** to return to the receiving mode.

### **Receiving a Message**

1. Turn the radio on.
2. Adjust the volume
3. Select a desired channel

*Note : You can receive a message only when the other party's channel and sub-tone code are the same as you have with your radio.*

## **4. Advanced Operation**

### **Repeater/Talk-around**

At the following conditions, you can directly communicate with the other party by using the talk-around function.

- In case that a repeater is not activated.
- When you are out of the repeater range.

To operate on/off function of talk-around, your dealer must program a side button for the **repeater/talk-around** function.

If you hear the positive beep when you press the repeater/talk-around button, your radio is not using the repeater. On the contrary, if you hear the negative beep, your radio is using the repeater.

### ***Setting Squelch Level***

The Squelch function plays a role in controlling the amount of signals the radio receive. Setting the radio to the tight squelch level, you can avoid unwanted signal or noise, but you may not receive a weak signal. So, it will be better for you to select the Normal Squelch level.

You can change between the tight and normal squelch level as below:

- The ***positive beep*** means your transceiver is set as tight squelch.
- The ***negative beep*** means your transceiver is set as normal squelch.

### ***Handsfree Transmission (VOX)***

This option enables you to have handsfree conversation. Your voice or sound around the radio is detected, and the radio automatically goes to the TX mode without pressing the PTT Button.

#### ***VOX Operations***

To set your radio to VOX mode, you have to:

1. Turn the radio off.
2. Turn the radio on with the side button 1 being pressed.
3. VOX is activated through the radio built-in microphone.
4. VOX is also activated through the optional headset microphone once the headset is connected through the microphone connector on the radio.

### ***Selecting VOX Sensitivity***

To change the VOX sensitivity between low and high, you should:

1. Turn the radio off.
2. Turn the radio on with the side button 2 being pressed.

## Scan

This feature allows you to monitor all the channels automatically for valid signals. Your dealer can program more than 16 channels on the scan list.

### Scan operation

By pressing a side button in which the **scan** function is programmed, you can operate the scan function.

1. Press the **scan button** to begin scanning.
2. Press the **scan button** one more time to stop scanning.

*Note : The LED flashes green color while scanning.*

### Talkback

With the talkback function being activated, if your radio has scanned a channel on which there is a party with whom you want to talk, you can directly communicate with the party by pressing and holding down the PTT Button.

### Deleting a Nuisance Channel

When the radio has scanned a channel which you don't want to hear, you can temporarily remove the channel from the scan list by using the **nuisance channel delete** feature.

If the radio is locked onto a unwanted channel, press the **nuisance delete** button until you hear beep two times.

*Note : If the priority function is programmed by your dealer, you cannot remove the priority channel from the scan list. The last channel also cannot be deleted from the scan list.*

*Note : To bring a deleted nuisance channel back into the scan list, you must reset the radio.*

***BCLO (Busy Channel Lock Out)***

This feature inhibits transmission whenever the unit detects another conversation is on the same channel. This is programmable feature and can be switched on and off by programming process.

***TOT (Time-out Timer)***

This feature prevents channel congestion and helps conserve battery life by automatically powering down the unit after a designated period of time. This timer can be selected to be set from minimum 15 seconds up to maximum 225 seconds. This feature can be switched on and off by pc programming process.

***Priority Function***

This function allows the radio to assign more time to monitor the priority channel while scanning. Your dealer can program the priority function by using the TTI software.

<b>PRIORITY FUNCTION</b>	<b>SCAN SEQUENCE</b>
Inactivity	ch1 → ch2 → ch3 → ch4 ..... ch1
Activity	ch1 → ch2 → ch1 → ch3 → ch1 → ch4 → ch1

***Call Ringer***

The radio provides 5 selectable call ringer sounds to alert to an incoming call.

Your dealer can assign one of the call ringer sounds. The selected call ringer sound can be mute on the transmitting radio by pc program.

## 5. Specification

### Product Specification

#### • General

Frequency:	446.00625-446.09375 MHz
Number of Channels:	16 Channels
Power Supply:	7.5V DC
Antenna Impedance:	50 Ohms
PLL Step:	5kHz, 6.25kHz
Operating Temperature Range:	-30°C to +60°C (EIA) -25°C to +55°C (ETS)
Dimensions With Standard NiMH Battery:	H (132mm) X W (56mm) X D (36mm)
Weight (With Standard Ni-MH Battery):	350g
Average Battery Life @ 5/5/90 Cycle: (With Standard Ni-MH Battery)	10 hours
Environmental Sealing:	MIL-STD-810-C, D & E and IP 54
Shock and Vibration:	Impact Resistant Housing Exceeding MIL STD-810-C, D & E and TIA/EIA603

#### • Transmitter

Frequency Separation:	Full Bandsplit
Channel Spacing:	12,5 kHz
Freq. Stability (-30°C to +60°C):	+/-2.5 ppm
Power:	0.5W ERP
Modulation Limiting:	+/-2.5 kHz @ 12.5 kHz
FM Hum & Noise:	40dB
Spurious/Harmonics:	36 dBm < 1GHz, -30 dBm > 1GHz
Adjacent Channel Power:	-60dB @12.5 kHz
Audio Distortion:	3 % typ. (1kHz/40% dev.)
FM Modulation:	12.5 kHz 11 K0F3E

• **Receiver**

Sensitivity	@ 12dB SINAD (EIA) : 0.25uV typ.
	@ 20dB SINAD (ETS) : 0.60uV typ.
Adjacent Channel Selection :	-60dB @ 12.5kHz
Intermodulation :	70dB (EIA), 65dB (ETS)
Spurious Rejection :	70dB (EIA)
Hum and Noise :	-45 dB @ 12.5kHz
Rated Audio Output :	400mW typ. @ 5% distortion
Audio Distortion :	3%
Conducted Spurious Emission :	57dBm < 1GHz

**CE Declaration**

CE 0682

CE Version of the TX-446 which Display the “CE” symbol on the product label, complies with the essential requirements of the European Radio and Telecommunication Terminal Directive 1999/5/CE.



This warning symbol indicates that this equipment operates in non-harmonized frequency bands and/or may be subject to licensing conditions in the country of use. Be sure to check that you have the correct version of this radio or the correct programming of this radio, to comply with national licensing requirement.

**Safety Requirement**

For charging the battery, only CE-approved AC adaptors must be used for the charger cradle in compliance with the following specifications:

\* OUTPUT : DC 14V 150mA

