Two-Way Radios

Quick Start Guide

XT460 Display model

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SAFETY

PRODUCT SAFETY AND RF EXPOSURE COMPLIANCE

Before using this product, read the operating instructions and RF energy awareness information contained in the Product Safety and RF Exposure booklet enclosed with your radio.

ATTENTION!

This radio is restricted to occupational use only to satisfy ICNIRP/FCC RF energy exposure requirements.

For a list of Motorola-approved antennas, batteries, and other accessories, visit the following website which lists approved accessories:

http://www.motorolasolutions.com

BATTERIES AND CHARGERS SAFETY INFORMATION

This document contains important safety and operating instructions. Read these instructions carefully and save them for future reference.

Before using the battery charger, read all the instructions and cautionary markings on

- the charger,
- the battery, and
- the radio using the battery

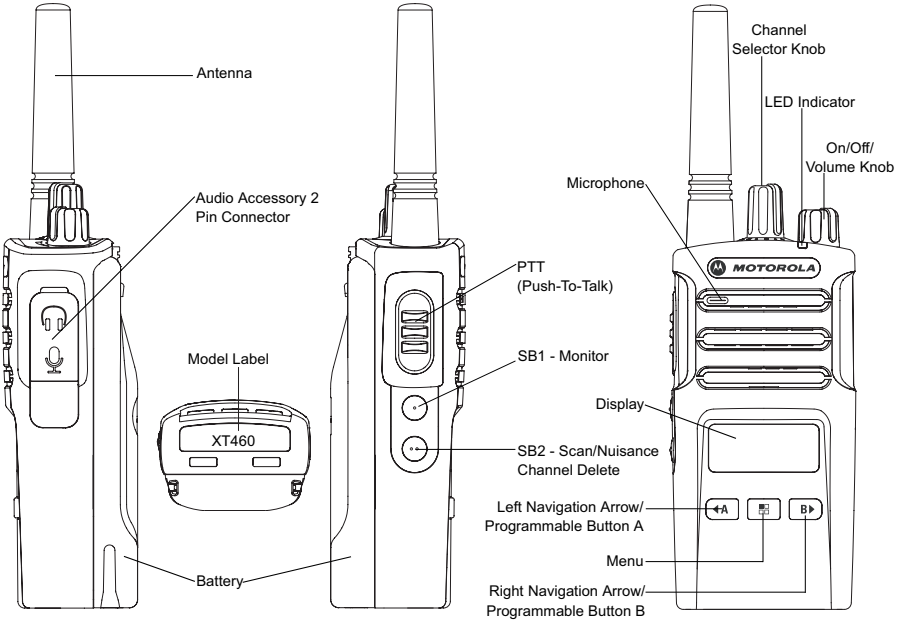
1. To reduce risk of injury, charge only the rechargeable Motorola-authorized batteries. Other batteries may explode, causing personal injury and damage.
2. Use of accessories not recommended by Motorola may result in risk of fire, electric shock, or injury.
3. To reduce risk of damage to the electric plug and cord, pull by the plug rather than the cord when disconnecting the charger.
4. An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in risk of fire and electric shock. If an extension cord must be used, make sure that the cord size is 18AWG for lengths up to 6.5 feet (2.0 m), and 16AWG for lengths up to 9.8 feet (3.0 m).
5. To reduce risk of fire, electric shock, or injury, do not operate the charger if it has been broken or damaged in any way. Take it to a qualified Motorola service representative.
6. Do not disassemble the charger; it is not repairable and replacement parts are not available. Disassembly of the charger may result in risk of electrical shock or fire.
7. To reduce risk of electric shock, unplug the charger from the AC outlet before attempting any maintenance or cleaning

OPERATIONAL SAFETY GUIDELINES

- Turn the radio OFF when charging battery.
- The charger is not suitable for outdoor use. Use only in dry locations/conditions.
- Connect charger only to an appropriately fused and wired supply of the correct voltage (as specified on the product).
- Disconnect charger from line voltage by removing main plug.
- The outlet to which this equipment is connected should be nearby and easily accessible.
- Maximum ambient temperature around the power supply equipment must not exceed 40°C (104°F).
- Make sure that the cord is located where it will not be stepped on, tripped over, or subjected to water, damage, or stress.

RADIO OVERVIEW

PARTS OF THE RADIO



On/Off/Volume Knob

Used to turn the radio ON or OFF and to adjust the radio's volume.

Microphone

Speaks clearly into the microphone when sending a message.

Antenna

The radio's antenna is non-removable.

Accessory Connector

Used to connect compatible audio accessories.

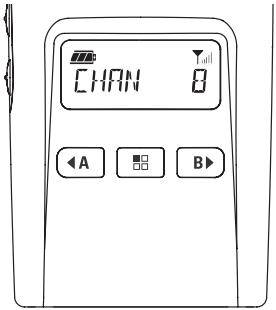
Model Label

Indicate the model of the radio.

LED Indicator

Used to give battery status, power-up status, radio call information and scan status.

Front Buttons



- **Button**

Gives access to set up features like VOX/iVOX levels, etc. It also allows you to move through all the features while in Programming Mode.
Default set to preset Channel 1.

- **Programmable Button**

Allows you to choose level or toggle options for features the Menu is on.
Default set to generate current programmed call tone.

- **Programmable Button**

Allows you to choose level or toggle options for features the Menu is on.

Default set to Backlight Mode.

Note: A short press of either Programmable Button (A or B) tunes the radio to the preset channel and the radio will play a good chirp. You can assign different functions to these buttons via the CPS. For example: Backlight Time Out, Reverse Burst, Scan/Nuisance Channel Delete, Monitor and Call Tones. To learn more about how to program these buttons, refer to “Entering Programming Mode” on page 15 and “CPS (Computer Programming Software)” on page 15.

Side Buttons

- **Push-To-Talk (PTT) Button**

Press and hold down this button to talk, release it to listen.

- **Side Button 1 (SB1)**

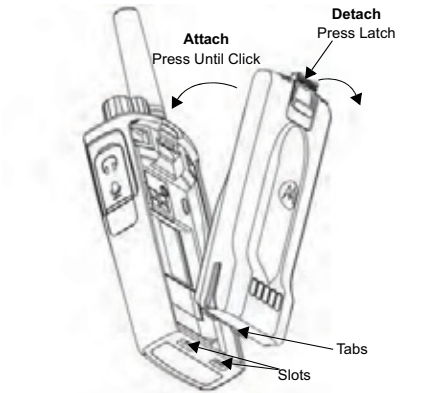
The Side Button 1 is a general button that can be configured by the CPS. Default set to Monitor Mode.

- **Side Button 2 (SB2)**

The Side Button 2 is a general button that can be configured by the CPS. Default set to Scan/Nuisance Channel Mode.

BATTERIES AND CHARGERS

Installing the Lithium-Ion (Li-Ion) Battery



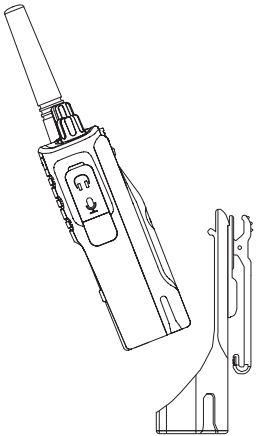
1. Turn OFF the radio.
2. With the Motorola logo facing up on the battery pack, insert the tabs at the bottom of the battery with the slots at the bottom of the radio's body.
3. Press down on the battery, top first, towards the radio until a click is heard.

Removing the Lithium-Ion (Li-Ion) Battery

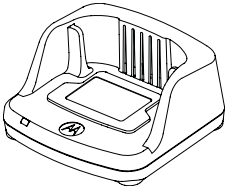
1. Turn OFF the radio.
2. Push down the battery latch and hold it depressed while removing the battery.
3. Pull the battery away from the radio.

Holster

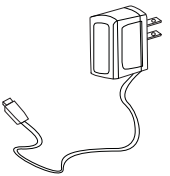
XT420 and XT460 will be coming with Holster instead of Belt Clip to improve the wearability.



Power Supply, Adaptors and Drop-in Tray Charger



Drop-in Tray Charger



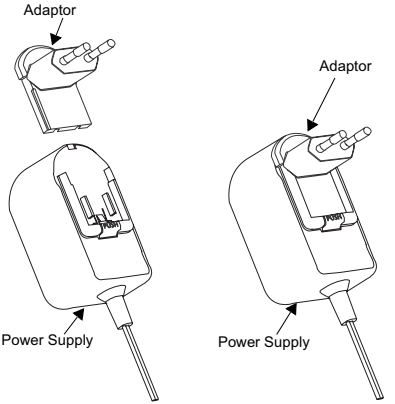
Power Supply

Your radio comes with one Drop-in Tray Charger, one Power Supply (also known as Transformer) and a set of adaptors.

Your Power Supply is capable of switching to suit any of the adaptors that comes with your radio package.

The Adaptor you install depends on the region you're located.

Once you have identified the Adaptor that matches your electrical outlet, proceed to install it as follows:

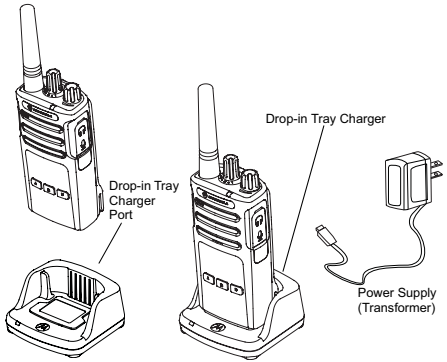


- Slide down the Adaptor grooves into the Power Supply until it snaps into place.
- Slide the Adaptor upward to remove.

Note: The adaptor shown in the pictures are for illustration purposes only. The adaptor you install may be different.

When acquiring additional Charger or Power Supply, make sure you have the similar Drop-in Tray Charger and Power Supply set.

Charging with the Drop-in Tray Single Unit Charger



1. Place the Drop-in Tray Single Unit Charger on a flat surface.
2. Insert the connector of the Power Supply into the port on the side of the Drop-in Tray Single Unit Charger.
3. Plug the AC Adaptor into a power outlet.
4. Insert the radio into the Drop-in Tray Single Unit Charger with the radio facing the front, as shown.

Note: When charging a battery attached to a radio, turn the radio OFF to ensure a full charge. See “Operational Safety Guidelines” on page 3 for more information.

Charging a Standard Battery

The Drop-in Tray Single Unit Charger is designed to charge either the battery (with the radio or with radio and holster on) or a standalone battery.

Table 1: Motorola Authorized Batteries

Part Number	Description
PMNN4434_R	Standard Li-Ion Battery
PMNN4453_R	High Capacity Li-Ion Battery

Drop-in Tray Single Unit Charger LED Indicators

Table 2: Charger LED Indicator

Status	LED Status	Comments
Power On	Green for approx. 1 sec	
Charging	Steady red	
Charge Complete	Steady green	
Battery Fault (*)	Red fast flash	
Waiting to charge (**)	Amber slow flash	
Battery Level Status	Flash red 1 time	Battery low
	Flash amber 2 times	Battery medium
	Flash green 3 times	Battery high

(*) Normally, re-positioning the battery pack will correct this issue.
(**) Battery temperature is too warm or too cold or wrong power voltage is being used.
If there is NO LED indication:

1. Check if the radio with battery, or the battery alone, is inserted correctly.
2. Ensure that the power supply cable is securely plugged into the charger socket.
3. Confirm that the battery being used with the radio is listed in Table 1.

GETTING STARTED

For the following explanations, refer to “Parts Of The Radio” on page 4 of the user guide.

TURNING RADIO ON/OFF

To turn ON the radio, rotate the ON/OFF/Volume Knob clockwise. The radio plays one of the following:

- Power up tone and channel number announcement, or
- Battery level and channel number announcements, or
- Silent (Audible tones disabled)

The LED blinks red briefly.

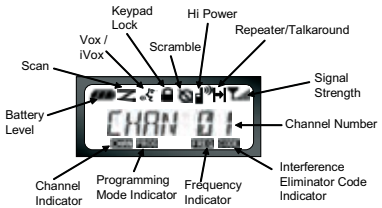
To turn the radio OFF, rotate the ON/OFF/Volume Knob counterwise until you hear a ‘click’ and the radio LED indicator turns OFF.

ADJUSTING VOLUME

Turn the ON/OFF/Volume Knob clockwise to increase the volume, or counterclockwise to decrease the volume.

Note: Do not hold the radio too close to the ear when it is at a high volume setting or when adjusting the volume setting.

READING THE DISPLAY



Note: The radio display shown here is for icon location only. Each radio display may appear different (channel and code) based on the pre-programmed radio defaults and features available in the model or region. Pressing any button, except the PTT button, will turn on the backlight.

SELECTING A CHANNEL

Use the Channel Selector Knob to access a specific channel.

During powering on or switching channel, the voice annunciation will confirm the channel number.

Program each channel separately. Each channel has its own Frequency, Interference Eliminator Code and Scan Settings.

TALKING AND MONITORING

It is important to monitor for traffic before transmitting to avoid ‘talking over’ someone who is already transmitting.

To monitor, press and hold the SB1(*) button to access channel traffic. If no activity is present, you will hear ‘static’. To release, press the SB1 button again. Once channel traffic has cleared, proceed with your call by pressing the PTT button. When transmitting, the radio LED will be solid red.

Note: In order to listen to all activities on a current channel, short press the SB1 button in order to set the CTCSS/DPL code to 0. This feature is called “CTCSS/DPL Defeat (Squelch set to SILENT)”.

(*) This assumes SB1 button has not been programmed for a different mode.

RECEIVING A CALL

1. Select a channel by rotating the Channel Selector Knob until you reach the desired channel.
2. Make sure the PTT button is released and listen for voice activity.
3. The LED Indicator blinks RED while the radio is receiving a call.
4. To respond, hold the radio vertically 1 to 2 inches (2.5 to 5 cm) from mouth. Press the PTT button to talk; release it to listen.

Note: Please note that when radio is receiving or transmitting, LED is always RED.

Note: Interference Eliminator Codes are referred also as CTCSS/DPL codes or PL/DPL codes

TALK RANGE

XT Series radios have been designed to maximize performance and improve transmission range in the field. It is recommended that you do no use the radios closer than 1.5 meters apart, to avoid interference. XT460 coverage is 16.250 square meters, 13 floors and 9 KM in flat areas.
Talk range depends on the terrain. It will be affected by concrete structures, heavy foliage and by operating radios indoors or in vehicles. Optimal range occurs in flat, open areas with up to 9 kilometers of coverage. Medium range occurs when buildings and trees are in the way. Minimal range occurs when dense foliage and mountains obstruct the communication path.
To establish a proper two-way communication, the Channel, Frequency and Interference Eliminator Codes must be the same on both radios. This depends on the stored profile that has been pre-programmed on the radio:

1. **Channel:** Current channel that the radio is using, depending upon radio model.
2. **Frequency:** The frequency the radio uses to transmit/ receive.
3. **Interference Eliminator Code:** These codes help minimize interference by providing a choice of code combinations.
4. **Scramble Code:** Codes that make the transmissions sound garbled to anyone listening who is not set to that specific code.
5. **Bandwidth:** Some frequencies have selectable channel spacing, which must match other radios for optimum audio quality.

For details of how to set up frequencies and CTCSS/DPL codes in the channels, refer to “Entering Programming Mode” on page 15

RADIO LED INDICATORS

RADIO STATUS	LED INDICATION
Channel Alias Edit	Red heartbeat
Cloning Mode	Two Orange Heartbeats
Cloning In Progress	Solid Orange
Fatal Error at Power up	One Green Blink, One Orange Blink, One Green Blink, then repeat for 4 seconds
Low Battery	Orange Hearbeat
Low Battery Shutdown	Fast Orange Heartbeat
Monitor	LED is OFF
Power-Up	Solid Red for 2 seconds
'Idle' Programming Mode /Channel Mode	Green Heartbeat
Scan Mode	Fast Red Heartbeat
Transmit (Tx)/Receive (RX)	Solid Red
Transmit in Low Power Select	Solid Orange
VOX/iVOX Mode	Double Red Heartbeats

Note: Channel Alias Edit only applies to Display Models

Reset To Factory Defaults

Reset To Factory Defaults will set back all radio features to the original factory default settings. To do so, press the PTT, SB1 and SB2 button simultaneously while turning ON the radio until you hear a high tone chirp beep.

PROGRAMMING FEATURES

Entering Programming Mode

Programming Mode is special radio mode that allows you to program basic radio's features by using the radio's panel programming.

To enter Programming Mode, press and hold the PTT Button and the SB1 Button simultaneously for 3 seconds, while turning ON the radio. A unique tone sounds, indicating the radio has entered Programming Mode. The radio LED blinks a green heartbeat.

Note: The default Programming Mode is set to 'Idle' Programming Mode.

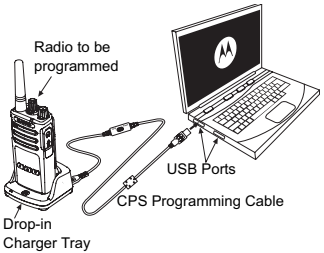
When the radio is set to Programming Mode, the PROG icon displays and the current channel aliasing name blinks to indicate that you can rotate the Channel Selector Knob to select the channel you want to program.

In Programming Mode, the radio is capable of setting values for each channel by toggling between the different programming modes available:

- Frequencies,
- CTCSS/DPL codes (Interference Eliminator Code),
- Scramble,
- Bandwidth,
- Maximum Channels,
- Call Tone,
- Microphone Gain and,
- Scan.

- To move along the different Programming Selection Mode without saving changes, short press the PTT Button or [ ] Button.
- To save changes, long press the PTT Button. The radio returns to 'Idle' Programming Mode.
- When in 'Idle' Programming Mode, long press the PTT button to exit the Programming Mode.
- Whenever you wrap around to the beginning of the Programming Mode options, the radio automatically saves all changes made, even if you turn OFF the radio.
- Exit the Programming Mode without saving changes (as long as you have not wrap around to the beginning of the Programming Mode options) by turning OFF the radio.

CPS (COMPUTER PROGRAMMING SOFTWARE)



XT Series radios are programmable using the CPS. The CPS is downloadable for free at www.motorolasolutions.com.

CPS allows the user to program Frequencies, PL/DPL codes as well as other features such as Direct Frequency Input, Repeater/Talk Around, Select, Time-Out Timer, Power Select, Battery Type Select, Scan List, Call Tones, Scramble, Reverse Burst, etc.

CPS is a very useful tool as it can lock the frontpanel radio programming or restrict any specific radio feature to be changed (to avoid preset radio values to be accidentally erased).

It also provides security by giving the option to set up a password for profile radio's management. Please refer to Features Summary Chart Section at the end of the User's Guide for more details.

Note: (*) CPS Programming Cable is an accessory sold separately. For part number information, refer to the Accessories Section.

See CPS CD for detailed information on CPS.

USE AND CARE

Use a soft damp cloth to clean the exterior

Do not immerse in water

Do not use alcohol or cleaning solutions

If the radio is submerged in water...

Turn radio OFF and remove batteries

Dry with soft cloth

Do not use radio until completely dry

Notes

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