

# RF Energy Exposure and Product Safety for Portable Two-Way Radios

**ATTENTION!** BEFORE USING THIS RADIO, READ THIS GUIDE WHICH CONTAINS IMPORTANT OPERATING INSTRUCTIONS FOR SAFE USAGE AND RF ENERGY AWARENESS AND CONTROL FOR COMPLIANCE WITH APPLICABLE STANDARDS AND REGULATIONS.

## RF Energy Exposure Awareness and Control Information and Operational Instructions for Occupational Use

**NOTICE:** This radio is intended for use in occupational/controlled conditions where users have full knowledge of their exposure and can exercise control over their exposure to meet the occupational limits in FCC and International standards. This radio device is **NOT** authorized for general population consumer use.

This two-way radio uses electromagnetic energy in the radio frequency (RF) spectrum to provide communications between two or more users over a distance. It uses radio frequency (RF) energy or radio waves to send and receive calls. RF energy is one form of electromagnetic energy. Other forms include, but are not limited to, sunlight and x-rays. RF energy, however, should not be confused with these other forms of electromagnetic energy, which when used improperly, can cause biological damage. Very high

levels of x-rays, for example, can damage tissues and genetic material.

Experts in science, engineering, medicine, health, and industry work with organizations to develop standards for safe exposure to RF energy. These standards provide recommended levels of RF exposure for both workers and the general public. These recommended RF exposure levels include substantial margins of protection.

All Motorola two-way radios are designed, manufactured, and tested to ensure they meet government-established RF exposure levels. In addition, manufacturers also recommend specific operating instructions to users of two-way radios. These instructions are important because they inform users about RF energy exposure and provide simple procedures on how to control it.

Please refer to the following websites for more information on what RF energy exposure is and how to control your exposure to assure compliance with established RF exposure limits:

<http://www.fcc.gov/oet/rfsafety/rf-faqs.html>

[www.who.int/en/](http://www.who.int/en/)

[www.motorolasolutions.com/rfhealth](http://www.motorolasolutions.com/rfhealth)

## Federal Communication Commission (FCC) Regulations

When two-way radios are used as a consequence of employment, the FCC requires users to be fully aware of and able to control their exposure to meet occupational requirements. Exposure awareness can be facilitated by the use of a product label directing users to specific user awareness information. Your Motorola two-way radio has a RF Exposure Product Label. Also, your Motorola user manual, or separate safety booklet includes information and operating instructions required to control your RF exposure and to satisfy compliance requirements.

### ***Compliance with RF Exposure Standards***

Your Motorola two-way radio is designed and tested to comply with a number of national and International standards and guidelines (listed below) for human exposure to radio frequency electromagnetic energy.

**This radio complies with the IEEE (FCC) and ICNIRP exposure limits for occupational/controlled RF exposure environments at operating duty factors of up to 50% talk-50% listen and is approved for occupational use only.** In terms of measuring RF energy for compliance with these exposure guidelines, **your radio generates measurable RF energy only while it is transmitting (during talking), not when it is receiving (listening) or in standby mode.**

**NOTE:** The approved batteries, supplied with this radio, are rated for a 5-5-90 duty factor (5% talk-5% listen-90% standby) even though this radio complies with FCC occupational exposure limits and may operate at duty factors of up to 50% talk.

Your Motorola two-way radio complies with the following RF energy exposure standards and guidelines:

- United States Federal Communications Commission (FCC), Code of Federal Regulations; 47 CFR et seq.
- FCC, OET Bulletin 65
- Institute of Electrical and Electronic Engineers (IEEE) C95.1
- International Commission on Non-Ionizing Radiation Protection (ICNIRP)
- Ministry of Health (Canada) Safety Code 6
- Industry Canada RSS-102
- Australian Communications Authority Radiocommunications Standard et seq.
- ANATEL ANNEX to Resolution No. 303 et seq.

## **RF Exposure Compliance and Control Guidelines and Operating Instructions for Two-Way Radio Operations**

To control your exposure and ensure compliance with the occupational/controlled environment exposure limits, always adhere to the following procedures.

- DO NOT remove the RF Exposure Label from the device.
- User awareness instructions should accompany device when transferred to other users.

## ***Operating Instructions***

- Transmit no more than the rated duty factor of 50% of the time. To transmit (talk), push the Push-To-Talk (PTT) button. To receive calls, release the PTT button. Transmitting 50% of the time, or less, is important because this radio generates measurable RF energy exposure only when transmitting (in terms of measuring for standards compliance).
- Private Talk Position (XTS 4000 Only). When placing or receiving a personal message, hold your radio as you would a wireline/wireless telephone. Speak directly into the microphone. Use the PTT as in a normal two-way operation.
- Two-Way Radio Operation. In front of the face, hold the radio in a vertical position with the microphone (and other parts of the radio including the antenna) at least one inch (2.5 centimeters) away from the nose or lips. Keeping the radio at a proper distance is important to ensure compliance.



**NOTE:** RF exposures decrease with increasing distance from the antenna.

- Body Worn Operation. When worn on the body, always place the radio in a Motorola-approved clip, holder, holster, case, or body harness for this product. Using approved body-worn accessories is important because the use of non-Motorola-approved accessories may result in exposure levels, which exceed the occupational/controlled environment RF exposure limits.

- Use only Motorola-approved supplied or replacement antennas, batteries, and audio accessories. Use of non-Motorola-approved antennas, batteries, and accessories may exceed the applicable RF exposure guidelines (IEEE, ICNIRP or FCC).
- For a list of Motorola-approved accessories for your radio model, visit the following website:  
<http://www.motorolasolutions.com>

## **Electromagnetic Interference/ Compatibility**

**NOTE:** Nearly every electronic device is susceptible to electromagnetic interference (EMI) if inadequately shielded, designed, or otherwise configured for electromagnetic compatibility.

### **Facilities**

To avoid electromagnetic interference and/or compatibility conflicts, turn off your radio in any facility where posted notices instruct you to do so. Hospitals or health care facilities may be using equipment that is sensitive to external RF energy.

### **Aircraft**

When instructed to do so, turn off your radio when on board an aircraft. Any use of a radio must be in accordance with applicable regulations per airline crew instructions.

## **Medical Devices**

### ***Pacemakers***

The Advanced Medical Technology Association (AdvaMed) recommends that a minimum separation of 6 inches (15 centimeters) be maintained between a handheld wireless radio and a pacemaker. These recommendations are consistent with those of the U.S. Food and Drug Administration.

Persons with pacemakers should:

- ALWAYS keep the radio more than 6 inches (15 centimeters) from their pacemaker when the radio is turned ON.
- Not carry the radio in the breast pocket.
- Use the ear opposite the pacemaker to minimize the potential for interference.
- Turn the radio OFF immediately if there is any reason to suspect that interference is taking place.

### ***Hearing Aids***

Some digital wireless radios may interfere with some hearing aids. In the event of such interference, you may want to consult your hearing aid manufacturer to discuss alternatives.

### ***Other Medical Devices***

If you use any other personal medical device, consult the manufacturer of your device to determine if it is adequately shielded from RF energy. Your physician may be able to assist you in obtaining this information.

## Use of Communication Devices While Driving

Always check the laws and regulations on the use of radios in the areas where you drive.

- Give full attention to driving and to the road.
- Use hands-free operation, if available.
- Pull off the road and park before making or answering a call, if driving conditions or regulations so require.

## Acoustic Safety

Exposure to loud noises from any source for extended periods of time may temporarily or permanently affect your hearing. The louder the radio's volume, the less time is required before your hearing could be affected. Hearing damage from loud noise is sometimes undetectable at first and can have a cumulative effect.

To protect your hearing:

- Use the lowest volume necessary to do your job.
- Turn up the volume only if you are in noisy surroundings.
- Turn down the volume before adding headset or earpiece.
- Limit the amount of time you use headsets or earpieces at high volume.
- When using the radio without a headset or earpiece, do not place the radio's speaker directly against your ear.



## Operational Warnings



**WARNING**

### **For Vehicle With Air Bags:**

**Refer to vehicle manufacturer's manual prior to installation of electronic equipment to avoid interference with air bag wiring. DO NOT place a portable radio in the area over an air bag or in the air bag deployment area. Air bags inflate with great force. If a portable radio is placed in the air bag deployment area and the air bag inflates, the radio may be propelled with great force and cause serious injury to occupants of the vehicle.**

**Potentially Explosive Atmospheres (Explosive atmospheres refers to hazard classified locations that may contain hazardous gas, vapors, or dusts.)**

**Turn off your radio prior to entering any area with a potentially explosive atmosphere unless it is a portable radio type especially qualified for use in such areas as Intrinsically Safe (for example, Factory Mutual, CSA, UL, or CENELEC).**



**WARNING**

**DO NOT** remove, install, or charge batteries in such areas. Sparks in a potentially explosive atmosphere can cause an explosion or fire resulting in bodily injury or even death.

The areas with potentially explosive atmospheres referred to above include fueling areas such as below decks on boats, fuel or chemical transfer or storage facilities, and areas where the air contains chemicals or particles such as grain, dust or metal powders. Areas with potentially explosive atmospheres are often, but not always, posted.

#### **Blasting Caps and Blasting Areas**

To avoid possible interference with blasting operations, turn off your radio when you are near electrical blasting caps, in a blasting area, or in areas posted: "Turn off two-way radio." Obey all signs and instructions.

## Operational Cautions



Caution

### **Antennas**

DO NOT use any portable radio that has a damaged antenna. If a damaged antenna comes into contact with your skin, a minor burn can result.

### **Batteries**

All batteries can cause property damage and/or bodily injury, such as burns, if a conductive material such as jewelry, keys, or beaded chains touches exposed terminals. The conductive material may complete an electrical circuit (short circuit) and become quite hot. Exercise care in handling any charged battery, particularly when placing it inside a pocket, purse, or other container with metal objects.

## **Intrinsically Safe Radio Information**

The Intrinsically safe approval unit refers to a product that has been approved as intrinsically safe by an approval agency (for example FM Approvals, CSA, UL, or Cenelec) and certifies that a particular product meets the Agency's applicable intrinsic safety standards for specific types of hazardous classified locations. A portable radio that has been approved for intrinsic safety will have Approval label attached to the radio to identify the unit as being Approved for specified hazardous atmospheres. This label specifies the hazardous Class/Division/Group along with the

part number of the battery that must be used. The Intrinsically Safe Approval Label will be located on the portable radio unit.

## Operational Cautions for Intrinsic Safe Equipment



Caution

- DO NOT operate radio communications equipment in a hazardous atmosphere unless it is a type especially qualified (for example, FM, UL, CSA, or CENELEC approved). An explosion or fire may result.
- DO NOT operate a radio unit that has been approved as intrinsically safe product in a hazardous atmosphere if it has been physically damaged (for example, cracked housing). An explosion or fire may result.
- DO NOT replace or charge batteries in a hazardous atmosphere. Contact sparking may occur while installing or removing batteries and cause an explosion or fire.

## Warnings for Radios Approved as Intrinsically Safe

Radios must ship from the Motorola manufacturing facility with the hazardous atmosphere capability and the intrinsic safety approval labelling (FM, UL, CSA, CENELEC). Radios will not be upgraded to this capability and labeled once they have been shipped to the field.

A modification changes the unit's hardware from its original design configuration. Modifications can only be made by the original product manufacturer.



- **DO NOT** replace or change accessories in a hazardous atmosphere. Contact sparking may occur while installing or removing accessories and cause an explosion or fire.
- Turn the radio off before removing or installing a battery or accessory.
- **DO NOT** disassemble an intrinsically safe product in any way that exposes the internal circuits of the unit.
- Failure to use an intrinsically safe approved battery or Approved accessories specifically approved for the radio unit may result in the dangerously unsafe condition of an unapproved radio combination being used in a hazardous location
- Unauthorized or incorrect modification of the intrinsically safe approved Product will negate the approval rating of the product.



WARNING

- **Incorrect repair or relabeling of any intrinsically safe Agency-approved radio could adversely affect the Approval rating of the unit.**
- **Use of a radio that is not intrinsically safe in a hazardous atmosphere could result in serious injury or death.**

## Repair



WARNING

**REPAIRS FOR MOTOROLA PRODUCTS WITH INTRINSICALLY SAFE APPROVAL ARE THE RESPONSIBILITY OF THE USER.**

**Repairs to a Motorola FM approved radio product should only be done at a location that has been FM audited under the FM 3605 repairs and service standard.**

**Contact Motorola for assistance regarding repairs and service of Motorola intrinsically safe equipment.**

A repair constitutes something done internally to the unit that would bring it back to its original condition.

Items not considered as repairs are those in which an action is performed on a unit which does not require the outer casing of the unit to be opened in a manner that exposes the internal electrical circuits of the unit.

### ***Do Not Substitute Options or Accessories***

The Motorola communications equipment certified as intrinsically safe by the approving agency, (FM, UL, CSA, CENELEC) is tested as a complete system which consists of the listed agency Approved portable, Approved battery, and Approved accessories or options, or both. This Approved portable and battery combination must be strictly observed. There must be no substitution of items, even if the substitute has been previously Approved with a different Motorola communications equipment unit. Approved configurations are listed by the Approving Agency (FM, UL, CSA, CENELEC).

The Intrinsically Safe Approval Label affixed to radio refers to the intrinsically safe classification of that radio product, and the approved batteries that can be used with that system.

The manual PN referenced on the Intrinsically Safe Approval Label identifies the approved Accessories and or options that can be used with that portable radio unit.

Using a non-Motorola-intrinsically-safe battery and or accessory with the Motorola approved radio unit will void the intrinsically safe approval of that radio unit.

## **XPR 7150** Series Digital Portable Radios Quick Reference Guide

### ■ Radio Controls





Record your radio's programmable button functions in the blanks provided. SP represents short press, LP represents long press.

- 1 Channel Selector Knob
- 2 On/Off/Volume Control Knob
- 3 LED Indicator
- 4 Push-to-Talk (PTT) Button
- 5 Side Button 1 (Programmable)  
SP: \_\_\_\_\_ LP: \_\_\_\_\_
- 6 Side Button 2 (Programmable)  
SP: \_\_\_\_\_ LP: \_\_\_\_\_
- 7 Microphone
- 8 Speaker
- 9 Universal Connector for Accessories
- 10 Emergency Button
- 11 Antenna

## ■ LED Indicator

**Blinking red** – Radio is transmitting at low battery condition, receiving an emergency transmission, has failed the self-test upon powering up, or has moved out of range if radio is configured with Auto-Range Transponder System.


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**Solid green** – Radio is powering up or transmitting. Also indicates full charge of the battery when **Battery Strength** button is pressed.

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**Blinking green** – Radio is receiving a non-privacy-enabled call or data, detecting activity or retrieving Over-the-Air Programming transmissions over the air.

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**Double blinking green** – Radio is receiving a privacy-enabled call or data. 


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**Solid yellow** – Radio is monitoring a conventional channel or in Bluetooth Discoverable Mode. Also indicates fair battery charge when **Battery Strength** button is pressed.

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**Blinking yellow** – Radio is scanning for activity, receiving a Call Alert, or all local Linked Capacity Plus channels are busy.

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**NOTE:**  Indicates a conventional Digital Mode-Only feature.

**Double blinking yellow** – Radio is no longer connected to the repeater while in Capacity Plus or Linked Capacity Plus, all Capacity Plus channels and Linked Capacity Plus channels are currently busy, Auto Roaming is enabled, radio is actively searching for a new site. Also indicates radio has yet to respond to a group call alert, or radio is locked.

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**NOTE:** For Capacity Plus and Linked Capacity Plus, there is no LED indication when the radio is detecting activity over the air.

## Charging the Battery

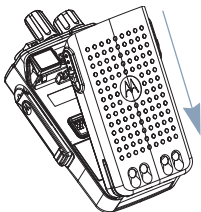
Your radio is powered by a Lithium-Ion (Li-Ion) battery. To avoid damage and comply with warranty terms, charge the battery using a Motorola charger *exactly* as described in the charger user guide. It is recommended your radio remains powered off while charging.

Charge a new battery 14 to 16 hours before initial use for best performance.

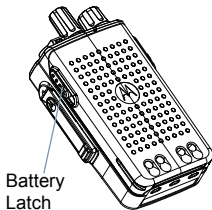
**IMPORTANT:** **ALWAYS** charge your IMPRES battery with an IMPRES charger for optimized battery life and valuable battery data. IMPRES batteries charged exclusively with IMPRES chargers receive a 6-month capacity warranty extension over the standard Motorola Premium battery warranty duration.

## ■ Attaching the Battery

Fit the battery into the slots at the bottom of the radio and push the top of the battery down until the latch snaps into place.



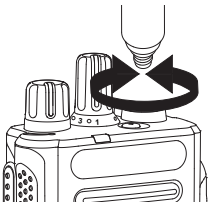
*To remove the battery, turn the radio off. Move the battery latch into unlock position and hold.*



## ■ Attaching the Antenna

With the radio turned off, set the antenna in its receptacle and turn clockwise.

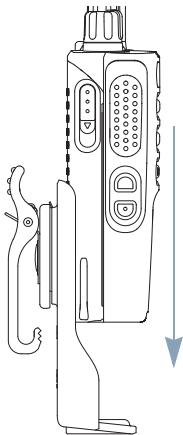
Make sure that the antenna is tightened securely to the radio.



*To remove the antenna, turn the antenna counterclockwise.*

## ■ Attaching the Carry Holster

Align the rails on the carry holster with the grooves on the battery and press downwards until you hear a click.



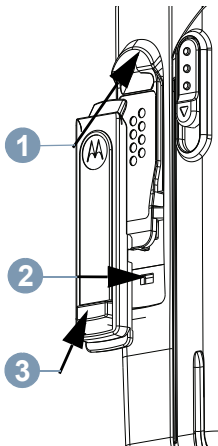
## ■ Attaching the Universal Connector Cover (Dust Cover)

The universal connector is located on the antenna side of the radio. It is used to connect MOTOTRBO accessories to the radio.

1. Insert the slanted end of the cover into the slots above the universal connector.
2. Press downwards on the cover to seat the dust cover properly on the Universal Connector.
3. Secure the dust cover to the radio by pushing the latch upwards.

*To remove the dust cover, push the latch downwards. Lift the cover up and slide down the dust cover from the universal connector to remove it.*

*Replace the dust cover when the universal connector is not in use.*



## ■ Powering Up the Radio

Rotate the **On/Off/Volume Control Knob** clockwise until you hear a click. The LED lights up solid green.

If enabled, a brief tone sounds indicating that the power up test is successful.

*To turn off the radio, rotate the knob counterclockwise until you hear a click.*

## ■ Adjusting the Volume

To increase the volume, turn the **On/Off Volume Control Knob** clockwise.

*To decrease the volume, turn this knob counterclockwise.*

**NOTE:** Your radio can be programmed to have a minimum volume offset where the volume level cannot be turned down fully. Check with your dealer or system administrator for more information.

## ■ Accessing the Radio from Password

1. Power up the radio.

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2. You hear a continuous tone.

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3. Use the **Channel Selector Knob** to enter the first digit of the password.

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4. Press Side Button 1 or 2 to enter each digit of the remaining three digits of the password. You hear a positive indicator tone for each Side Button press. When the second digit of the password is entered, your radio ignores any **Channel Selector Knob** position change.

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5. When the last digit of the four-digit password is entered, your radio automatically checks the validity of the password.

If the password is correct:

Your radio proceeds to power up. See **Powering Up the Radio** on **page 24**.

**OR**

If the password is incorrect:

You hear a continuous tone. Repeat Steps 1 to 3.

**OR**

After the third incorrect password, your radio enters into locked state. A tone sounds and the LED double blinks yellow.

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*Your radio enters into locked state for 15 minutes, and responds to inputs from **On/Off/Volume Control Knob**.*

**NOTE:** Please see User Guide for details on **Unlocking Radio from Locked State**.

## Selecting a Zone

A zone is a group of channels. Your radio supports up to 32 channels and 2 zones, with a maximum of 16 channels per zone.

1. Press the programmed **Zone** button.

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2. You hear a positive indicator tone, indicating the radio has switched from Zone 1 to Zone 2.


**OR**


You hear a negative indicator tone, indicating the radio has switched from Zone 2 to Zone 1.

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## Selecting a Channel

Once the required zone is set (if you have multiple zones in your radio), turn the programmed **Channel Selector Knob** to select the channel, subscriber ID, or group.

**NOTE:**  Indicates a conventional Analog Mode-Only feature.

 Indicates a conventional Digital Mode-Only feature.

## Making a Group Call

1. Turn the **Channel Selector Knob** to select the channel with the active group alias or ID.

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  2. Hold the radio vertically 1 to 2 inches (2.5 to 5.0 cm) from your mouth.

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  3. Press the **PTT** button to make the call. The LED lights up solid green.
-

4. Wait for the Talk Permit Tone to finish (if enabled) and speak clearly into the microphone.

**OR**

-  Wait for the **PTT** Sidetone to finish (if enabled) and speak clearly into the microphone.

- 
5. Release the **PTT** button to listen. When the target radio responds, the LED blinks green.

- 
6.  If the Channel Free Indication feature is enabled, you will hear a short alert tone the moment the target radio releases the **PTT** button, indicating the channel is free for you to respond. Press the **PTT** button to respond.

**OR**

If there is no voice activity for a predetermined period of time, the call ends.

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## Making a Private Call

1. Turn the **Channel Selector Knob** to select the channel with the active subscriber alias or ID.
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2. Hold the radio vertically 1 to 2 inches (2.5 to 5.0 cm) from your mouth.
- 
3. Press the **PTT** button to make the call. The LED lights up solid green.
- 
4. Wait for the Talk Permit Tone to finish (if enabled) and speak clearly into the microphone.
- 
5. Release the **PTT** button to listen. When the target radio responds, the LED blinks green.
-

6. If the Channel Free Indication feature is enabled, you will hear a short alert tone the moment the target radio releases the **PTT** button, indicating the channel is free for you to respond. Press the **PTT** button to respond.

**OR**

If there is no voice activity for a predetermined period of time, the call ends.


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7. You hear a short tone.
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## Making an All Call

1. Turn the **Channel Selector Knob** to select the channel with the active All Call group alias or ID.
2. Hold the radio vertically 1 to 2 inches (2.5 to 5.0 cm) from your mouth.
3. Press the **PTT** button to make the call. The LED lights up solid green.
4. Wait for the Talk Permit Tone to finish (if enabled) and speak clearly into the microphone.

**OR**

-  Wait for the **PTT** Sidetone to finish (if enabled) and speak clearly into the microphone.
- 

*Users on the channel cannot respond to an All Call.*

## Making a Phone Call

1. Press the programmed **Phone** button.

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2. The LED lights up solid green.

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3. You hear the dialing tone of the telephone user.

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4. Hold the radio vertically 1 to 2 inches (2.5 to 5.0 cm) from your mouth.

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5. Press the **PTT** button to talk and release it to listen.

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6. If the Channel Free Indication feature is enabled, you will hear a short alert tone the moment the target radio releases the **PTT** button, indicating the channel is free for you to respond. Press the **PTT** button to respond.  
**OR**  
If there is no voice activity for a predetermined period or time, the call ends.

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7. You hear a short tone.

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## Scanning Channels

**NOTE:** This feature is not applicable in Capacity Plus and Linked Capacity Plus.

Press the programmed **Scan** button to turn scan on or off.

*During scan, the LED blinks yellow and you hear a positive indicator tone.*

## Making a Call Alert

1. Press the programmed **One Touch Access** button to make a Call Alert to the predefined ID.

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2. The LED lights up solid green when your radio is sending the Call Alert.

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3. If the Call Alert acknowledgement is received, two chirps sound.  
**OR**  
If the Call Alert acknowledgement is not received, a low-pitched tone sounds.

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## Sending an Emergency Alarm

- NOTE:** If your radio is set to Silent, it will not display any audio or visual indicators during Emergency mode.
1. Press the programmed **Emergency On** button.

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  2. The LED lights up solid green.

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## Bluetooth® Operation



### Turning Bluetooth On or Off

1. Turn on your Bluetooth-enabled device and place it in pairing mode. Refer to respective Bluetooth-enabled device's user manual.

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2. On your radio, press the programmed **Bluetooth Connect** button.

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3. A tone sounds and LED blinks yellow.

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4. Your Bluetooth-enabled device may require additional steps to complete the pairing. Refer to respective Bluetooth-enabled device's user manual.

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5. If successful, a positive tone sounds.  
**OR**  
If unsuccessful, a negative indicator tone sounds.

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*Do not turn off your Bluetooth-enabled device during the finding and connecting operation as this cancels the operation.*

*Your radio connects to the Bluetooth-enabled device within range with either the strongest signal strength, or to one which it has connected to before in a prior session.*

**NOTE:** A pin code may be required to be programmed in your radio before it can pair with some devices. Contact your dealer for more information.



## Disconnecting from a Bluetooth Device

1. Press the programmed **Bluetooth Disconnect** button.

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2. A positive indicator tone sounds when disconnected.

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**NOTE:** For more details about the above mentioned operations, and advanced features supported by the radios, please consult the User Guide documents:

- **68009677001 MOTOTRBO XPR 7150 Non-Display Portable User Guide**







**MOTOROLA**

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