

APX™ TWO-WAY RADIOS

# APX 4000 (2 KNOBS) MODEL 3



## INTERACTIVE END USER TOOLKIT (IEUTK)

Livingston County, NY Public Safety

*Model 3*



This declaration is applicable to your radio only if your radio is labeled with the FCC logo shown below.

## DECLARATION OF CONFORMITY

Per FCC CFR 47 Part 2 Section 2.1077(a)



### Responsible Party

Name: Motorola Solutions, Inc.

Address: Motorola Solutions, Inc., 1303 East Algonquin Road Schaumburg, IL60196, U.S.A.

Phone Number: 1-800-927-2744

Hereby declares that the product:

Model Name: **APX 4000**

conforms to the following regulations:

FCC Part 15, subpart B, section 15.107(a), 15.107(d) and section 15.109(a)

### **Class B Digital Device**

As a personal computer peripheral, this device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

**Note:**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



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

### ATTENTION!

#### **This radio is restricted to Occupational use only.**

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 Motorola-approved antennas, batteries, and other accessories, visit the following website:  
<http://www.motorolasolutions.com/APX>

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 the Motorola-approved antenna types with the maximum permissible gain and required antenna impedance for each antenna type indicated.

Antenna types not included, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

This Interactive End User Toolkit (IEUTK) covers the basic operation of the APX 4000 (2 Knobs) Model 2 & Model 3.

However, your dealer or system administrator may have customized your radio for your specific needs. Check with your dealer or system administrator for more information.

Adobe Flash player is required to run the demos included with this kit.

Please refer to the Adobe website (<http://get.adobe.com/flashplayer/>) to update/download/install the Adobe Flash Player.

### **Notations Used in This Tutorial**

Throughout the text in this toolkit, you will notice the use of **WARNING**, **Caution**, and **Note**. These notations are used to emphasize that safety hazards exist, and the care that must be taken or observed.






An operational procedure, practice, or condition, etc., which may result in injury or death if not carefully observed.



An operational procedure, practice, or condition, etc., which may result in damage to the equipment if not carefully observed.

**Note:** *An operational procedure, practice, or condition, etc., which is essential to emphasize.*

The following special notations identify certain items:

Example	Description
<b>Home</b> button or 	Buttons and keys are shown in bold print or as an icon.
<b>Znup</b>	Menu entries are shown similar to the way they appear on the radio's display.
	This means "Press the right side of the 4-way Navigation button."
<b>Model 3</b>	Feature/Procedure applies to <b>Model 3</b> only.
	Click to play demo of the procedure.

### Additional Performance Enhancement

The following are some of the latest creations designed to enhance the security, quality and efficiency of the radios.

#### **ASTRO 25 Enhanced Data**

ASTRO 25 Enhanced Data is optimized to handle different message sizes and variable update rates from different applications of the radio. Add Enhanced Data to the Integrated Data system with a software installation to improve data channel efficiency and enable denser network traffic.

#### **Dynamic System Resilience (DSR)**

DSR ensures the radio system is seamlessly switched to a backup master site dynamically in case of system failure. DSR also provides additional indication e.g. failure detection, fault recovery, and redundancy within the system to address to the user in need. Mechanisms related to the Integrated Voice and Data (IV & D) or data centric are all supported by DSR.

#### **CrossTalk Prevention**

This feature prevents crosstalk scenario from happening, especially when a wideband antenna is used. This feature allows the adjustment of the Trident Transmitting SSI clock rate in the radio to be varied from the Receiving Frequency. This subsequently reduced the possibilities of radio frequency interfering spurs and prevents the issues of crosstalk.

#### **Encrypted Integrated Data (EID)**

EID provides security encryption and authentication of IV & D data bearer service communication between the radio and the Customer Enterprise Network.

#### **SecureNet**

SecureNet allows user to perform secured communications on an Analog or Motorola Data Communication (MDC) channel. The MDC OTAR feature will allow users to perform OTAR activities on an MDC channel.

**MODEL 3**



*\* These radio controls/buttons are programmable.*



## ❑ Charging the Battery



### To avoid a possible explosion:

- **DO NOT** replace the battery in any area labeled “hazardous atmosphere”.
- **DO NOT** discard batteries in a fire.

The Motorola-approved battery shipped with your radio is uncharged. Prior to using a new battery, charge it for a minimum of 16 hours to ensure optimum capacity and performance.

**Note:** When charging a battery attached to a radio, turn the radio off to ensure a full charge.

### Battery Charger

To charge the battery, place the battery, with or without the radio, in a Motorola-approved charger. The charger’s LED indicates the charging progress; see your charger’s user guide.

## Battery Charger

To charge the battery, place the battery, with or without the radio, in a Motorola-approved charger. The charger's LED indicates the charging progress.

Note: Similar radio shown  
Charging procedures will  
remain the same



*Multi Unit Charger*



*Single Unit Charger*

*Continued...*

## IMPRES Adaptive Charger

- Monitors the usage pattern of the IMPRES battery and,
- Stores that information in the IMPRES battery, then
- Performs a recondition cycle only when needed.
- Will not overheat the battery regardless of how long it is left in the charger.
- Charger monitors the battery and automatically “tops off” the battery, as required.



### NOTE:

- The battery must be charged before use.
- Memory effect is a phenomenon that causes a loss in battery capacity or voltage due to repetitive shallow discharging or long-term overcharging.
- This memory effect has been greatly reduced in your batteries through the use of new cell technology.
- It is still recommended that you discharge your battery as much as possible before recharging it.
- Recharging after each shift is good standard practice.
- When charging a battery that is attached to your radio, turn the radio off to ensure a full charge.



*Continued...*

**Charge Indicator Description**

**Single Flash Green** Charger has successfully powered up.

**Steady Red** Battery is in rapid charge mode.

**Flashing Green** Battery has completed rapid charge (>90% available capacity). Battery is in Top-Off charge (Trickle Charge) and requires approximately 1 hour.

**Steady Green** Battery has completed charging and is fully charged.

**Flashing Yellow** Battery is recognized by charger but is waiting to charge. (Either the battery voltage is too low or the battery temperature is too low or too high to allow charging. When this condition is corrected, the battery will begin charging).

**Flashing Red** Battery is unchargeable or not making proper contact.

**Steady Yellow** Battery is in condition mode. The length of time the charger remains in this mode is dependent upon the state of charge remaining in the battery when inserted. (Fully charged batteries require more time to recondition—8 hours or more—than fully discharged batteries.)

**Flashing Red & Green** Battery may be approaching the end of its rated service life. This is not a fault indication, merely a notification to the user that the battery may soon no longer be able to yield expected service and may need to be replaced.

### Automatic Reconditioning of the Battery:

When the IMPRES battery is properly inserted into the charger, the charger determines if it is appropriate to recondition the battery.

If the battery needs reconditioning, the charger automatically indicates a **STEADY YELLOW**. This process may take **8 hours or more** to complete, depending upon the state of charge and capacity rating of the battery when inserted.

**NOTE:** It important that the battery be allowed to complete the recondition/recharge process for it to be effective. Leave the battery in the charger until the charger indicates a **STEADY GREEN**.

### **NOTE:**

*Toward the end of the rapid charge cycle (**STEADY RED** indication), the battery voltage exceeds the normal operating voltage of the radio. Voltage returns to a normal level following the rapid charge mode or when the battery is removed from the charger.*

*If the radio is turned on while the charger is in rapid charge mode, the radio becomes temporarily inoperable. This condition can be cleared by removing the radio from the charger and turning the radio off and on again.*

*During the reconditioning process, the battery becomes fully discharged. As a result, the radio may not function during reconditioning mode.*

*Continued...*

### Manually Terminating Reconditioning:

At any time during the reconditioning process (**STEADY YELLOW** indication), remove and reinsert the battery within **5 seconds**. This causes the charger to terminate the reconditioning process and begin the charging process. The charger indicator changes to a **STEADY RED**.

### Manual Reconditioning of the Battery:

Within **2 ½ minutes** of the initial insertion of an IMPRES battery (**STEADY RED** indication), remove and reinsert the battery within **5 seconds** to manually force reconditioning to occur. The charger indicator changes from a **STEADY RED** to a **STEADY YELLOW**. This forces the charger to recondition and automatically recharge the battery.

**NOTE:** Excessive use of this feature reduces the cycle life of the battery.



Continued...

**Initial Battery Charge:**

1. Must be in an IMPRES Adaptive Charger to properly calibrate the IMPRES battery and enable the Smart Energy features. This process is indicated by a **STEADY YELLOW** indicator light.
2. The process is automatic and includes an initial reconditioning and then begins charging upon completion of this process.
3. To ensure optimum performance prior to the initial use, all new batteries should be left in the charger until the light turns solid green.

If this process is interrupted, the charger will calibrate the battery upon the next insertion.

**NOTE:**

IMPRES batteries may be charged in conventional chargers. However, the Smart Energy features will not be enabled.

New batteries (never used before) may prematurely indicate a full charge (STEADY GREEN indication).



## ❑ Attaching/Removing the Battery

Slide the battery into the radio's frame until the bottom latch clicks into place.



To remove the battery, turn the radio off. Lift up the latch then slide the battery down to remove the battery from the radio.



**Note:** If your radio is preprogrammed with volatile-key retention, the encryption keys are retained for approximately 30 seconds after battery removal.

Check with your dealer or system administrator for more information. You can view the status of your IMPRES battery.



## ❑ Attaching/Removing the Antenna

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

To remove the antenna, turn the antenna counterclockwise. Make sure you turn off the radio first.



## ❑ Attaching/Removing the Accessory Connector Cover

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

**Note:** To prevent damage to the connector, shield it with the connector cover when not in use.

*Insert the hooked end of the cover into the slot above the connector.*

*Press downward on the cover's top to seat it in the slot.*

*Once in place, tighten by rotating the thumbscrew clockwise by hand.*

To remove the accessory connector cover, rotate the thumbscrew counterclockwise until it disengages from the radio.

If the thumbscrew is too tight, use an Allen wrench to loosen it first.

Rotate and lift the connector cover to disengage it from the radio.



## □ Attaching/Removing the Belt Clip

Align the grooves of the belt clip with those of the radio and press upward until you hear a click.

To remove the clip, use a flat bladed object to press the belt clip tab away from the radio.

Then, slide the clip downward and away from the radio.



## ❑ Turning on/off the Radio

Rotate the **On/Off/Volume Control Knob** clockwise until you hear a click.

If the power-up test is successful, you see the Home screen.

**Note:** If the power-up test is unsuccessful, you see **Error XX/YY** (XX/YY is an alphanumeric code).

Turn off the radio, check the battery, and turn the radio back on. If the radio fails the power-up test again, record the **Error XX/YY** code and contact your dealer.

**Note:** If the power-up test is successful, but you see **Hardware board absent** or **Hw Board Mismatch**.

Then, send the radio to the qualified technician to fix this error.

If the power-up test is successful, but you see, **Hw Board Failed** or **Man-Down Hw Error**, send the radio to the qualified technician to fix this error.

To turn off the radio, rotate the **On/Off/Volume Control Knob** counterclockwise until you hear a click.



## □ Adjusting the Volume

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

To decrease the volume, rotate the **On/Off/Volume Control Knob** counterclockwise.



## □ Programmable Features

Any reference in this manual to a control that is “preprogrammed” means that the control must be programmed by a dealer or a qualified radio technician using the radio’s programming software, in order to assign a feature to that control.

The programmable buttons can be programmed as shortcuts to radio functions or preset channels/groups depending on the duration of a button press:

- **Press** – Pressing and releasing rapidly.
- **Long press** – Pressing and holding for the programmed duration (between 0.25 seconds and 3.75 seconds).
- **Hold down** – Keeping the button pressed.

### Assignable Radio Functions

**Call Alert** – Allows the radio to function like a pager, or to verify if a radio is active on the system.

**Call Response** – Allows you to answer a private call

**Emergency** – Depending on the programming, initiates or cancels an emergency alarm or call.

**Information** – Displays the information of the radio.

**Nuisance Delete** – Temporarily removes an unwanted channel, except for priority channels or the designated transmit channel, from the scan list.

**Monitor (Conventional Only)** – Monitors a selected channel for all radio traffic until function is disabled.

**Scan** – Toggles scan on or off.

**Talkaround/Direct (Conventional Only)** – Toggles between using a repeater and communicating directly with another radio.




**Zone Select** – Allows selection from a list of zones.

**Assignable Settings or Utility Functions**

**Light**— Press the button to toggle the display backlight on or off; press and hold the button to reverse the content of the top display.

## □ Accessing the Preprogrammed Functions

You can access various radio functions through one of the following ways:

- A short or long press of the relevant programmable buttons.
- Use the **Menu Select Buttons** ( , , and  ).

### Using the Menu Select Buttons

The **Menu Select Buttons** allow to access the menu entries of features.

**Note:** Check with your dealer or system administrator for the list of features activated in your radio.

Your radio may be preprogrammed differently from the following example, but the steps for selecting a channel may appear as shown below:


- Press the **Menu Select** button (  ) directly below **CHAN**.







## Using the Navigation Buttons

### Home Button

The  button returns you to the Home (default) screen. In most cases, this is the current mode.

For selected radio features, the  button is also used to save user-edited radio settings or information before returning you to the Home screen.

**Note:** Some features do not require you to press  to go to the Home screen. Refer to the individual feature sections in this manual for further details on saving user-edited radio settings or information.

### Data Feature Button

Use this button to access data-related features, such as the Text Messaging Service (TMS) feature screen.

### 4-Way Navigation Button

Use this button to scroll up, down, left or right.

Press and release one of the button to scroll from one entry to the next one. Press and hold one of the button to have the radio toggles through the list automatically (release the button to stop).

## ❑ Push-To-Talk (PTT) Button

The **PTT** button on the side of the radio serves two basic purposes:

- While a call is in progress, the **PTT** button allows the radio to transmit to other radios in the call. Press and hold down **PTT** button to talk. Release the **PTT** button to listen. The microphone is activated when the **PTT** button is pressed.
- While a call is not in progress, the **PTT** button is used to make a new call.

Push-to-Talk  
(PTT) Button



## □ Status Icons

The 160 x 90 pixel front liquid crystal display (LCD) of the radio shows radio status, text entries, and menu entries. The top display row contain color icons that indicate radio operating conditions.

The following are the icons that appear on the radio's display.



### Receiving

Radio is receiving a call or data.



### Transmitting

Radio is transmitting a call or data.



### Battery

The number of bars (0 – 4) shown indicates the charge remaining in the battery. Blinks when the battery is low.



### Received Signal Strength Indicator (RSSI)

The number of bars displayed represents the received signal strength for the current site, for trunking only. The more stripes in the icon, the stronger the signal.



### Direct

- On = Radio is currently configured for direct radio-to-radio communication (during conventional operation only).
- Off = Radio is connected with other radios through a repeater.



### Monitor (Carrier Squelch)

Selected channel is being monitored (during conventional operation only).



### Power Level

- L = Radio is set at Low power.
- H = Radio is set at High power.

**Scan**

Radio is scanning a scan list.

**Priority Channel Scan**

- Blinking dot = Radio detects activity on channel designated as Priority-One.
- Steady dot = Radio detects activity on channel designated as Priority-Two.

**Secure Operation**

- On = Secure operation.
- Off = Clear operation.
- Blinking = Receiving an encrypted voice call.

**User Login Indicator (IP Packet Data)**

- On = User is currently associated with the radio.
- Off = User is currently not associated with the radio.
- Blinking = Device registration or user registration with the server failed due to an invalid username or pin.

**Data Activity**

Data activity is present.

## □ Top Light bar and LED Indicators

The Top Light bar and LED indicators show the operational status of your radio.



## ❑ Top Light bar and LED Indicators

### *LED Indications*

**Solid red** – Radio is transmitting.

**Blinking red** – Radio is transmitting at low battery condition.

**Rapidly blinking red** – Radio has failed the self test upon powering up or encountered a fatal error.

**Solid yellow (Conventional Only)** – Channel is busy.

**Blinking yellow** – Radio is receiving a secured transmission.

**Solid green** – Radio is powering up, or is on a non-priority channel while in the Scan List Programming mode.

**Blinking green** – Radio is receiving an individual or telephone call, or is on a Priority-Two channel while in the Scan List Programming mode.

**Rapidly blinking green** – Radio is on a Priority-One channel while in the Scan List Programming mode.

**Note:** No LED indication when the radio receives a clear (non-secured) transmission in trunking Mode.

## ❑ Top Light bar and LED Indicators

### *Top Light bar Indications*

This feature temporarily changes the color of the Top Lightbar and adds a color bar to the main display screen to help signal that a radio event has occurred.

**Note:** This feature must be preprogrammed by a qualified radio technician.



## ❑ Intelligent Lighting Indicators

This feature temporarily changes the radio's display backlight color and the alert text background color to help signal that a radio event has occurred.

**Note:** This feature must be preprogrammed by a qualified radio technician.

Backlight and Bar Color	Notification	When
Orange	Emergency Alerts	The radio initiates an emergency alarm or call.
		The radio receives an emergency alarm or call.
		The radio initiates the Man Down Post-Alert timer.
		The radio initiates Fireground Evacuation alarm.
Red	Critical Alerts	The radio battery is low.
		The radio is out of range.
		The radio enters fail-soft mode.
		The radio is unable to establish a full connection with the system.
		The radio is unable to authenticate or register with the system.
Green	Call Alerts	The radio receives a private call.





Orange

Emergency Alerts



Red

Critical Alerts









Green

Call Alerts

## ☐ Alert Tones

An alert tone is a sound or group of sounds. Your radio uses alert tones to inform you of your radio's conditions. The following table lists these tones and when they occur.

You Hear	Tone Name	Heard
<b>Short, Low-Pitched Tone</b>    <b>Play</b>	Radio Self Test Fail	When radio fails its power-up self test.
	Reject	When unauthorized request is made.
	Time-Out Timer Warning	Four seconds before time out.
	No ACK Received	When radio fails to receive an acknowledgment.
	Individual Call Warning Tone	When radio is in an individual call for greater than 6 seconds without any activity.
<b>Long, Low-Pitched Tone</b>  	Time-Out Timer Timed Out	After time out.
	Talk Prohibit/PTT Inhibit	(When <b>PTT</b> button is pressed) transmissions are not allowed.
	Out of Range	(When <b>PTT</b> button is pressed) the radio is out of range of the system.
<b>Play</b>	Invalid Mode	When radio is on an unprogrammed channel.

You Hear	Tone Name	Heard
<p><b>Short, Medium-Pitched Tone</b></p>  <p><b>Play</b></p>	Valid Key-Press	When correct key is pressed.
	Radio Self Test Pass	When radio passes its power-up self test.
	Clear Voice	At beginning of a non-coded communication.
	Priority Channel Received	When activity on a priority channel is received.
	Emergency Alarm Entry	When entering the emergency state.
	Central Echo	When central controller has received a request from a radio.
<p><b>Long, Medium-Pitched Tone</b></p>  <p><b>Play</b></p>	Volume Set	When volume is changed on a quiet channel.
	Emergency Exit	When exiting the emergency state.
<p><b>A Group of Medium-Pitched Tones</b></p>	Fail-soft	When the trunking system fails.
<b>Play</b>		

## ❑ Selecting a Zone

A zone is a group of channels.

### Procedure:

DEMO

- 1 < or > to **Zone**.
- 2 Press the **Menu Select** button directly below **Zone**.
- 3 ^ OR v to the required zone.

OR

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Use the keypad to enter the zone number.

*If the zone number entered is unprogrammed, the display shows **Invalid entry**.*

Repeat Step 2.

**OR**..Navigate to Znp or Zndn and toggle your choice to desired Zone

- 4 Press the **Menu Select** button directly below **Sel** to confirm the displayed zone.
- 5 Press the **PTT** button to transmit on the displayed zone channel.

## ❑ Selecting a Radio Channel

A channel is a group of radio characteristics, such as transmit/receive frequency pairs.

### Procedure:

#### [16-Position Select Knob]

- 1 Turn the preprogrammed **16-Position Select Knob** to the desired channel.

## ❑ Receiving and Responding to a Radio Call

Once you have selected the required channel and/or zone, you can proceed to receive and respond to calls.

The LED lights up solid red while the radio is transmitting. In conventional mode, the LED lights up solid yellow when the radio is receiving a transmission. In trunking mode, there is no LED indication when the radio receives a transmission.

If the radio is receiving a secure transmission, the LED blinks yellow.



## ❑ Receiving and Responding to a Radio Call

### *Receiving and Responding to a Talkgroup Call*

To receive a call from a group of users, your radio must be configured as part of that talkgroup.

#### **Procedure:**

When you receive a talkgroup call (while on the Home screen), depending on how your radio is preprogrammed:

#### **1 ASTRO Conventional Only:**

*The LED lights up solid yellow.*

*The display shows the talkgroup alias or ID, and the caller alias or ID.*

**OR**

#### **Trunking Only:**

*The display shows the caller alias or ID.*

#### **2 Press the PTT button to respond to the call.**

*The LED lights up solid red.*

#### **3 Release the PTT button to listen.**



## ❑ Making a Radio Call

You can select a zone, channel, subscriber ID, or talkgroup by using:

- The **16-Position Select Channel Knob**.

**Note:** If the feature inactivity timer is enabled, your radio automatically exits the feature when your radio is left idle long enough for the time to expire. You will hear the Menu Inactive Exit Tone upon feature exit.



## □ Making a Radio Call

### *Making a Talkgroup Call*

To make a call to a group of users, your radio must be configured as part of that talkgroup.

#### Procedure:

DEMO

1 Turn the **16-Position Select Channel Knob** to select the channel with the desired talkgroup.

2 Press the **PTT** button to make the call.

#### **ASTRO Conventional Only:**

*The LED lights up solid red.*

*The display shows the talkgroup alias or ID.*

#### **OR**

#### **Trunking Only:**

*The LED lights up solid red.*

Speak clearly into the microphone.

Release the **PTT** button to listen.



## □ Repeater or Direct Operation

The **REPEATER** operation increases the radio's range by connecting with other radios through a repeater. The transmit and receive frequencies are different.

The **DIRECT** or "talkaround operation" allows you to bypass the repeater and connect directly to another radio. The transmit and receive frequencies are the same.

### Procedure:

Direct/Talkaround channels are preprogrammed



## ☐ Monitoring Features

Radio users who switch from analog to digital radios often assume that the lack of static on a digital channel is an indication that the radio is not working properly. This is not the case.

Digital technology quiets the transmission by removing the “noise” from the signal and allowing only the clear voice or data information to be heard.

Monitor a channel to ensure the channel is clear before transmitting.

## ☐ Monitoring Features

### *Monitoring a Channel*

#### Procedure:

##### [Preprogrammed Button]

- 1 Press the preprogrammed **Monitor** button.
- 2 Adjust the volume if necessary.
- 3 Press and hold the **PTT** button to transmit.  
*The LED lights up solid red.*  
Release the **PTT** button to receive (listen).

#### OR

##### [Menu]

- 1 Select the desired zone and channel.  
Listen for a transmission.
- 2 Adjust the volume if necessary.
- 3 Press and hold the **PTT** button to transmit.  
*The LED lights up solid red.*  
Release the **PTT** button to receive (listen).

The Carrier Squelch indicator appears on the display when you monitor a channel via the preprogrammed **Monitor** button.

## ❑ Scan Lists

Scan lists are created and assigned to individual channels/groups.

Your radio scans for voice activity by cycling through the channel/group sequence specified in the scan list for the current channel/group.

Your radio supports different types of Scan Lists:

- Trunking Priority Monitor Scan List


Please refer to a qualified radio technician for the maximum number of Scan Lists can be programmed in your radio.

These lists must be preprogrammed by a qualified radio technician.

## □ Scan Lists

### *Viewing a Scan List*

#### Procedure:

- 1 < or > to **ScnL**.
- 2 Press the **Menu Select** button directly below **ScnL**.
- 3 ^ or v to view the members on the list.
- 4 Press  to exit the current display and return to the Home screen.



## ❑ Scan Lists

### *Editing the Scan List*

This feature lets you change scan list members and priorities.

#### Procedure:

[Menu]

DEMO

1 < or > to **ScnL**.

2 Press the **Menu Select** button directly below **ScnL**.  
*The display shows the lists that can be changed.*

3 ^ or v to the entry you want to edit.

4 Press the **Menu Select** button directly below **Sel** to add and/ or change the priority of the currently displayed channel in the scan list.

**OR**

Press the **Menu Select** button directly below **Del** to delete the currently displayed channel from the scan


**OR**

Press the **Menu Select** button directly below **Rcl** to view the next member of the scan list.

5  OR  to select more channels to be added or deleted.

**Model 3****OR**

Use the keypad to go directly to additional channels to be added or deleted.

6 Press  to exit scan list programming and return to the Home screen.

**Priority Status**

*A Scan icon indicates that the current channel is in the scan list as a non-priority channel.*

*The LED lights up solid green.*

**OR**

*A Priority-Two Channel Scan icon indicates that the current channel is in the scan list as the Priority-Two channel.*

*The LED blinks green.*

**OR**

*A Priority-One Channel Scan icon indicates that the current channel is in the scan list as the Priority-One channel.*

*The LED rapidly blinks green.*

*You hear all traffic on the Priority- One channel, regardless of traffic on non-priority channels.*

**OR**

*No icon indicates that the current channel is deleted from the scan list.*



## ❑ Scan

### *Turning Scan On or Off*

This feature allows you to monitor traffic on different channels by scanning a preprogrammed list of channels.

#### Procedure:

##### [Menu]

1 < or > to **Scan**.

2 Press the **Menu Select** button directly below **Scan**.

*The display shows **Scan off** if scan is disabled.*

*Press the **Menu Select** button directly below **Scan** to enable scan.*

#### OR

*The display shows **Scan on** and the scan status icon if scan is enabled.*

Press the **Menu Select** button directly below **Scan** to disable scan.

*The radio returns to the Home screen.*



## ❑ Scan

### *Deleting a Nuisance Channel*

If a channel continually generates unwanted calls or noise (termed a “nuisance” channel), you can temporarily remove the unwanted channel from the scan list.

This capability does not apply to priority channels or the designated transmit channel.

#### Procedure:

##### [Preprogrammed Button]

1 When the radio is locked onto the channel to be deleted, press the preprogrammed **Nuisance Delete** button.

The radio continues scanning the remaining channels in the list.



## ❑ Scan

### *Restoring a Nuisance Channel*

#### Procedure:

To restore the deleted nuisance channel, do one of the following:

- Turn the radio off and then turning it on again.

#### OR

- Stop and restart a scan via the preprogrammed **Scan** button or menu.

#### OR

- Change the channel via the **16-Position Select knob**.



## ❑ Call Alert Paging

This feature allows your radio to work like a pager.

**Note:** This feature must be preprogrammed by a qualified radio technician.

When you receive a Call Alert page, you hear four repeating alert tones and the LED blinks green. The call received icon blinks and the display shows **Page received**.

Press any button to clear the Call Alert page.

## □ Emergency Operation

The Emergency feature is used to indicate a critical situation.

If the **Top (Orange)** button is preprogrammed to send an emergency signal, this signal overrides any other communication over the selected channel.

Your radio supports the following Emergency modes:

- Emergency Alarm with Emergency Call

Check with your dealer or system administrator for more information on the programming of this feature.

**Note:** To exit emergency at any time, press and hold the preprogrammed **Emergency** button for about a second.

## □ Emergency Operation

### *Sending an Emergency Alarm with Emergency Call*

#### Procedure:

A green rectangular button with the word "DEMO" in white capital letters.

- 1 Press the preprogrammed **Emergency** button.

*The display shows **Emergency** and the current zone or channel.*

*You hear a short, medium-pitched tone and the LED momentarily blinks red.*

**OR**

*The display shows **No emergency**, if the selected channel does not support emergency.*

- 2 **The radio enters the Emergency Call state when:**

*You receive the dispatcher's acknowledgment.*

*The display shows **Ack received**.*

**OR**

*You receive no acknowledgement.*

*The display shows **No acknowledge**.*

**OR**

*You press the **PTT** button while in the Emergency Alarm mode.*

- 3 Press and hold the **PTT** button.  
Speak clearly into the microphone.
- 4 Release the **PTT** button to end the transmission and wait for a response from the dispatcher.
- 5 Press and hold the preprogrammed **Emergency** button for about a second to exit the Emergency Call mode.

**Note: Your radio will revert to a dispatch monitored channel when the emergency button is pressed.**

## □ Emergency Operation

### *Using the Emergency Keep-Alive Feature*

This feature, when enabled, prevents the radio from being turned off via the **On/Off Control Knob** when the radio is in the Emergency state.

**Note:** The radio only exits the Emergency state using one of the ways mentioned in the previous sections.



## ❑ Secure Operations

### *Selecting Secure/Clear Transmissions*

Secure radio operation provides the highest commercially available level of voice security on both trunked and conventional channels.

Unlike other forms of security, Motorola digital encryption provides signaling that makes it virtually impossible for others to decode any part of an encrypted message.

#### **Procedure:**

- 1 Encrypted channels are preprogrammed.

**Note:** If the selected channel is preprogrammed for clear-only operation – when you press the **PTT** button, you hear an invalid mode tone and the display shows **Clear TX only**. The radio will not transmit until you set the **Secure/ Clear** button to the clear position.

**Note:** If the selected channel is preprogrammed for secure only operation – when you press the **PTT** button, you hear an invalid mode tone and the display shows **Secure TX only**. The radio will not transmit until you set the **Secure/ Clear** button to the secure position.



## ❑ Trunking System Controls

### *Using the Fail-soft System*

The fail-soft system ensures continuous radio communications during a trunked system failure.

If a trunking system fails completely, the radio goes into fail-soft operation and automatically switches to its fail-soft channel.

#### **Procedure:**

- 1 During fail-soft operation, your radio transmits and receives in conventional operation on a predetermined frequency.
- 2 You hear a medium-pitched tone every 10 seconds and the display shows **Fail-soft**.

When the trunking system returns to normal operation, your radio automatically leaves fail-soft operation and returns to trunked operation.

**Model 3**



## ❑ Trunking System Controls

### *Going Out of Range*

When your radio goes out of the range of the system, it can no longer lock onto a control channel.

#### Procedure:

**DEMO**

1 You hear a low-pitched tone.

#### **AND/OR**

The display shows the currently selected zone/channel combination and **Out of range**.

Your radio remains in this out-of-range condition until:  
It locks onto a control channel.

#### **OR**

It locks onto a fail-soft channel.

#### **OR**

It is turned off.



## ❑ Trunking System Controls

### *Using the Site Trunking Feature*

If the zone controller loses communication with any site, that site reverts to site trunking.

The display shows the currently selected zone/channel combination and **Site trunking**.

**Note:** When this occurs, you can communicate only with other radios within your trunking site.

**Model 3**



## ❑ Controlling the Display Backlight

You can enable or disable the radio's display backlight as needed, if poor light conditions make the display or keypad difficult to read.

Depending on how your radio is preprogrammed, you can also maintain a minimum backlight level on the radio's front display.

**Note:** The backlight setting also affects the **Menu Select** buttons, the **Menu Navigation** buttons and the keypad backlighting accordingly.

### Procedure:

1 Press the preprogrammed **Light** button to toggle the backlight on or off.

**OR**

Press any key of the keypad, the **Menu Select** or **Menu Navigation** buttons, or any programmable radio controls or buttons to turn the backlight on.

**Note:** The backlight remains on for a preprogrammed time before it automatically turns off completely or returns to the minimum backlight level.

## ❑ Using the Time-Out Timer

This feature turns off your radio's transmitter. You cannot transmit longer than the preset timer setting.

If you attempt to do so, the radio automatically stops your transmission, and you hear a talk-prohibit tone.

The timer is set at 60 seconds.

**Note:** You will hear a brief, low-pitched, warning tone four seconds before the transmission times out.

### Procedure:

**1** Hold down the **PTT** button longer than the preprogrammed time.

*You hear a short, low-pitched warning tone, the transmission is cut-off, and the LED goes out until you release the **PTT** button.*

**2** Release the **PTT** button.  
*The timer resets.*

**3** Press the **PTT** button to re-transmit.  
*The time-out timer restarts and the LED lights up solid red.*

## ❑ Setting the Time and Date

You can set the time and date for your radio.

### Settings:

- The default time setting is a 12-hour clock. The display shows **12:00AM**.
- The AM/PM selection is not available for the 24-hour clock setting.
- The default setting for the domestic date shows **MDY**.

**Note:** Check with your dealer or system administrator for additional programmable settings for this feature.

### Procedure:

- 1 **< or >** to **Click**.
- 2 Press the **Menu Select** button directly below **Click**.  
*The display shows the current setting of the radio.*
- 3 Press the **Menu Select** button directly below **Edit**.  
*The first item blinks.*

- 4 **^** OR **v** to change the selected item.

**OR**

**< or >** one or more times to move to an item you wish to change.

**^** OR **v** to change the selected item.


**OR**

Press the **Menu Select** button directly below **Exit** to exit the screen without making any changes and return to the Home screen.

- 5 Press the **Menu Select** button directly below **Ok** once you have finished to save your changes and return to the Home screen.

**OR**

Press the **Menu Select** button directly below **Cncl** to discard all changes and return to the Home screen.

Press  at any time to return to the Home screen without saving your changes.

**Note:** If a call arrives while the radio is in the clock-setting menu, the radio exits clock setting and displays the call information. Any changes made before the call is NOT saved.

## ❑ Using the Digital PTT ID Feature

This feature allows you to see the radio ID (number) of the radio from whom you are currently receiving a transmission. This ID, consisting up to a maximum of eight characters, can be viewed by both the receiving radio and the dispatcher.

Your radio's ID number is also automatically sent every time the **PTT** button is pressed. This is a per-channel feature. For digital voice transmissions, your radio's ID is sent continuously during the voice message.



## □ Using the Smart PTT Feature

Smart **PTT** is a per-personality, programmable feature used in conventional radio systems to keep radio users from talking over other radio conversations.

When smart **PTT** is enabled in your radio, you cannot transmit on an active channel.

If you try to transmit on an active smart-**PTT** channel, you hear an alert tone, and the transmission is inhibited. The LED lights up solid yellow to indicate that the channel is busy.

Three variations of smart **PTT** are available:

Mode	Description
Transmit Inhibit on Busy Channel with Carrier	You cannot transmit if any traffic is detected on the channel.
Transmit Inhibit on Busy Channel with Wrong Squelch Code	You cannot transmit on an active channel with a squelch code or (if secure-equipped) encryption key other than your own. If the PL code is the same as yours, the transmission is not prevented.
Quick-Key Override	This feature can work in conjunction with either of the two above variations. You can override the transmit-inhibit state by quick-keying the radio. In other words, two <b>PTT</b> button presses within the preprogrammed time limit.



## ❑ Accessing the General Radio Information

Your radio contains information on the following:


- Radio Information
- IP Display
- Control Assignments
- Soft ID (If Enabled)

**Note:** The radio automatically exits the feature, if the feature inactivity timer is enabled, when the radio is left idle and the timer expires. You will hear the Menu Inactive Exit Tone upon feature exit.

### Accessing the Radio Information

This feature displays the following information of your radio:






- Host Version
- Secure Version
- Model Number
- ESN
- Flash Code
- Tuning Version
- Option Board Type (optional)
- Option Board Bluetooth Address (optional)
- Expansion Board Type (optional)
- DSP Version
- KG (Secure Algorithm)
- Serial Number
- Flash Size & Type
- RF Band
- Processor Version
- Option Board Serial Number (optional)
- Option Board Software Version (optional)

**Note:** Press  at any time to return to the Home screen.

Follow the procedure to view the information;





**Procedure:**

**[Preprogrammed Button]**




- 1 Press the preprogrammed **Info** button.
- 2 Press the **Menu Select** button directly below **Info**.
- 3  or  to required information.
- 4 Press the **Menu Select** button directly below **Sel.**  
*The display shows the Information screen.*
- 5  or  to scroll through the various information.  
**OR**  
Press the **Menu Select** button directly below **Back** to return to the previous screen.  
**OR**  
Press  to return to the Home screen.

**OR**

**[Menu]**

- 1  or  to **Info**.
- 2 Press the **Menu Select** button directly below **Info**.
- 3  or  to required information.

DEMO

- 4 Press the **Menu Select** button directly below **Sel.**  
*The display shows the Information screen.*
- 5  or  to scroll through the various information.  
**OR**  
Press the **Menu Select** button directly below **Back** to return to the previous screen.  
**OR**  
Press  to return to the Home screen.