



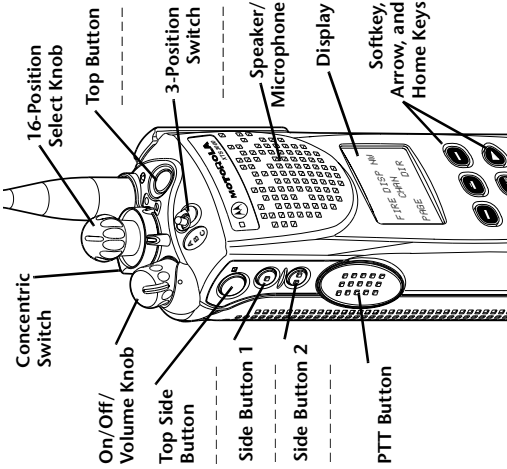
MOTOROLA
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XTS™ 3000 ASTRO® 25
Digital Portable Radio
Model II
User Guide

ASTRO® Digital XTS™ 3000 Model II Portable Radio

Quick-Reference Card



Write your radio's programmed features on the dotted line.

GENERAL

- Turning the Radio On:** Rotate the On/Off/Volume Control Knob clockwise.
- Monitoring (Conventional Channels Only):** Momentarily press the Monitor Button and listen for voice activity.
- Transmitting:** Press and hold the PTT Button.
- Receiving:** Release the PTT Button.

Selecting a Zone and Channel:

1. Press **[▶]** until the **ZONE** softkey appears.
2. Press **[◀]** directly below **ZONE**.
- 3a. Press **[▶]** until the desired zone name appears.
----- **OR** -----
- 3b. Enter the number of the desired zone.
If the displayed zone/channel combination is acceptable:

4. Press **[MEM]** or the **PTT Button**.

If you would like a different channel:

- 4a. Press **[▶]** until the **CHN** softkey appears.
 - 4b. Rotate the **Zone/Channel Select Knob** to the desired channel; then go to step 7.
- OR**

5. Press **[◀]** directly below **CHN**.

6. Press **[▶]** until the desired channel name appears.

7. Press **[HOME]** or the **PTT Button**.

COMMON RADIO FEATURES

Making an Individual Call:

- 1a. Press **[▶]** until one of the following softkeys appears:
 - 1b. Press the **Call** or **Page Button**, then go to step 3.
 - OR
 - 3.

CALL for a Private Conversation Call

PAGE for a Call Alert Page

2. Press **[◀]** directly below the desired softkey.

- 3a. If you wish to call the last number called, press the **PTT Button**.

- 3b. Press **[◀]** or **[▶]** until you locate the member's number you wish to call.

FOLD

COMMON and SPECIAL RADIO FEATURES

Most of your radio features can be accessed by performing the following steps (for more detail, refer to the feature description in your manual).

- 1a. Press **(▶)** until the desired softkey appears (see softkey list below).
 - 1b. Press (or rotate) the **Feature Button/Switch** (if programmed, see front of card), this takes you directly to step 3.
2. Press **(-)** directly below the desired softkey.

OR
3. In most cases, the display will change to show the current state of the feature and the available softkey choices.
- 4a. If you want to change the feature state, press **(-)** directly below the desired softkey choice.

OR
- 4b. If you do not want to change the feature state, press **(HOLD)** or the **PTI Button**.

Softkey Feature List

Softkey	Feature
CALL	Individual Private Conversation Call or Selection Call
CHAN	Channel Selection
DIR	Bypass Repeater (Talkaround) and Talk Directly to Another Radio
ERAS	Erase (Zeroization) of Encryption Key(s)
LOGF	Radio Lock (Log Off)
INDX	Encryption Key(s) Index Grouping
MUTE	Keypad Tones Muting
PRGE	Call-Alert Page
PRDS	List Programming of Individual-Call Numbers and Scan Channels

Softkey

Feature

Softkey	Feature
KEY	Encryption Key Selection
PSWD	Program New Password
PLMR	TX Power-Level Selection
REPDM	New Dynamic-Regrouping Request
SCAN	Scan Operation
SITE	Multiple Site Selection
STS	Status-List Selection
TGRP	Talkgroup Selection
VIEW	List Viewing
ZONE	Zone Selection



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XTS™ 3000 ASTRO® 25
Digital Portable Radio
Model II User Guide

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6881090C64-B

Product Safety and RF Exposure Compliance



Caution

Before using this product, read the operating instructions for safe usage contained in the Product Safety and RF Exposure booklet enclosed with your radio.

ATTENTION!

This radio is restricted to occupational use only to satisfy FCC RF energy exposure requirements. Before using this product, read the RF energy awareness information and operating instructions in the Product Safety and RF Exposure booklet enclosed with your radio (Motorola Publication part number 68P81095C98) to ensure compliance with RF energy exposure limits.

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Introduction

This manual describes how to operate an ASTRO® Digital XTS™ 3000 Type III Model II Portable Radio.

This manual discusses the following:

- General Radio Operation
- Common Radio Features
- Special Radio Features
- Helpful Tips

Use this manual to become familiar with your ASTRO radio.

Notations Used in This Manual

Throughout the text in this publication, you will notice the use of **WARNINGS**, **Cautions**, and **Notes**. 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:

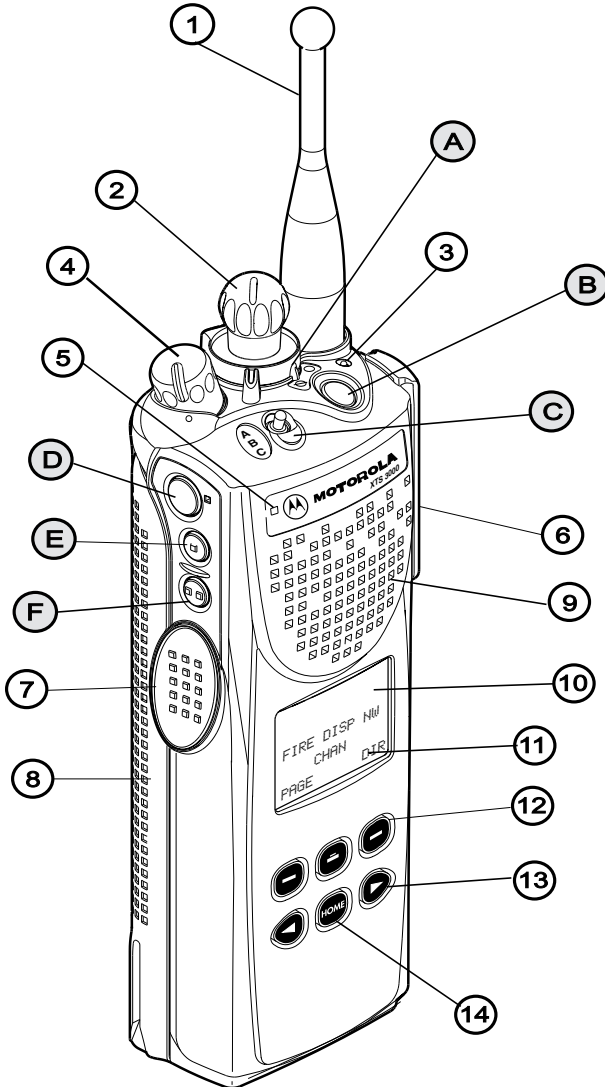
<i>Example</i>	<i>Description</i>
Light button	Button names are shown in bold print.

APCO Project 25 Radios

XTS 3000 ASTRO 25 digital radios are part of Motorola's Project 25 digital solution. When a radio is equipped with the ASTRO Digital CAI option, it complies with APCO Project 25 standards on conventional two-way radio systems and Common Air Interface (CAI) on digital trunked systems. Not only does the ASTRO Digital CAI option include Project 25 interoperable voice features, but other Project 25 compliant advanced digital signalling capabilities as well.

APCO Project 25 is the creation of the Association of Public Safety Communication Officers (APCO). It brings together representatives of various user groups to evaluate basic technologies in advanced land mobile radios to find common solutions to best serve the marketplace.

Your XTS 3000 ASTRO 25 Model II Radio



Note: Physical features are denoted by number (see Table 1 on page 4). Programmable controls are denoted by alphabet lettering (see Table 2 on page 4).

Physical Features of the XTS 3000 ASTRO 25 Model II Radio

Table 1: Physical Features

No.	Feature	Page	No.	Feature	Page
1	Antenna	14	8	Battery	11
2	16-Position Select Knob	26	9	Speaker	
3	LED	5	10	Liquid Crystal Display (LCD)	
4	On/Off/Volume Control Knob	23	11	Soft Keys (bottom 2 lines of LCD)	
5	Microphone		12	Soft key selection buttons	
6	Universal Connector Cover	19	13	Arrow Keys	
7	PTT (Push-to-Talk) Button	29	14	Home Key	

Programmable Controls

The following radio controls can be programmed to activate certain software features.

Table 2: Programmable Controls

No.	Feature	No.	Feature
A	2-Position Concentric Switch	D	Top Side (Select) Button
B	Orange Top Button	E	Side Button 1
C	3-Position A/B/C Switch	F	Side Button 2

The features that can be assigned to these controls by a qualified radio technician, and the pages where these features can be found are listed in Table 3 on page 5.

Note: Any references in this manual to controls that are preprogrammed mean that a qualified radio technician must use the radio's programming software to assign a feature to a control. Contact your system administrator for details.

Table 3: Programmable Features

<i>Feature</i>	<i>Page</i>	<i>Feature</i>	<i>Page</i>	<i>Feature</i>	<i>Page</i>
Call Response	52	Nuisance Delete	58	Secure/Clear	69
Channel	26	PL Defeat	53	Site Lock/ Unlock	76
Dynamic Priority	58	Repeater/Direct	53	Site Search	77
Emergency	43	Reprogram Request	66	Volume Set	23
Light/Backlight	5	Scan On/Off	57	Zone	24
Monitor	26	Scan List Programming	59		

Backlight

If poor light conditions make the channel numbers (around the **16-Position Select knob**) difficult to read, turn on the radio's backlight by pressing the preprogrammed **Light button** if applicable.

These lights remain on for a preprogrammed time before they turn off automatically, or you can turn them off immediately by pressing the **Light button** again.

LED Indicators






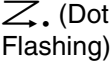
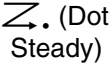

The LED on top of the radio indicates the radio's operating status:

Table 4: LED Indicators

<i>LED Indicator</i>	<i>What it Means</i>
Red	Radio transmitting
Flashing red	Channel busy, or Low battery (while transmitting)
Double flashing red	Receiving encrypted audio
Flashing green	Receiving an individual call

Status Indicators


Below are icons that may appear at various times on your radio's display:

Symbol	Indicator Name	Description
	Battery Status	Flashes when the battery is low.
	Carrier Squelch	Indicates the radio is operating in the carrier-squelch mode.
	Secure Operation	Appears when your radio is operating in secure mode. Does not appear when your radio is operating in clear mode. Flashes when an encrypted voice call is being received.
	Call Received	Flashes an individual call is received.
	Scan	Indicates the radio is scanning.
	Priority 1 Channel Scan	Indicates the radio is scanning the priority-one channel.
	Priority 2 Channel Scan	Indicates the radio is scanning the priority-two channel.
	View/Programming	Indicates the radio is in list view or programming mode; lights steady in view mode and flashes in programming mode.

<i>Symbol</i>	<i>Indicator Name</i>	<i>Description</i>
→	Direct	Indicates whether you are talking directly to another radio (talkaround) or through a repeater; on = direct; off = repeater. Appears when you are talking directly to another radio instead of through a repeater (that is, your radio is in talkaround mode).

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.

<i>Sound</i>	<i>Tone Name</i>	<i>Occurs:</i>
Short, Low-Pitched Tone	Invalid Key-Press	When the wrong key is pressed.
	Radio Self-Test Fail	When the radio fails its power-up self test.
	No ACK Received	When the radio fails to receive an acknowledgement from the dispatcher.
	Reject	When an unauthorized request is made.
	Time-Out Timer Warning	Four seconds before time out.
 Continuous, Low-Pitched Tone	Time-Out Timer Timed Out	After time out.
	Talk Prohibit/PTT Inhibit	When the PTT button is pressed and transmissions are not allowed.
	Out-of-Range	When the PTT button is pressed and the radio is out of range of the system.
	Invalid Mode	When the radio is on a channel that is not programmed.
	Individual Call Warning Tone	When the radio is in an individual call for greater than six seconds without any activity.

<i>Sound</i>	<i>Tone Name</i>	<i>Occurs:</i>
<i>A Group of Low-Pitched Tones (Busy Tone)</i>	Busy	When a channel, phone line, or system is unavailable due to high traffic volume.
<i>Short, Medium-Pitched Tone</i>	Valid Key-Press	When the correct key is pressed.
	Radio Self-Test Pass	When radio passes its power-up self test.
	Clear Voice	At the beginning of a non-coded communication.
	Priority Channel Received	Upon receipt of activity on a priority channel.
	Emergency Alarm Entry	Upon entering emergency state.
	Central Echo	When the central controller has received a request from a radio.
<i>Continuous, Medium-Pitched Tone</i>	Volume Set	Sounds when volume level is adjusted on a quiet channel.
	Emergency Exit	Upon exiting emergency state
	PTT Sidetone	When data is sent by pressing the PTT button , but the user must wait to talk.

Sound	Tone Name	Occurs:
A Group of Medium-Pitched Tones	Failsoft	When system fails.
	Automatic Call Back	When voice channel becomes available in response to a previous request.
	Talk Permit	Upon pressing the PTT button ; verifying system accepting transmissions.
	Dispatcher-Interrupter	Upon receipt of a dispatcher-interrupt call.
	Keyfail	When an encryption key has been lost.
	Console Acknowledge	When a status, message, emergency alarm, or reprogram request ACK is received.
	Received Individual Call	When a Call Alert or Private Conversation call is received.
	Call Alert Sent	When a Call Alert is received by the target radio.
Short, High-Pitched Tone (Chirp)	Low-Battery Chirp	When battery level is below preset threshold value
	Phone Dekey Chirp	When switching from radio to phone line upon releasing the PTT button .
Continuous, High-Pitched Tone	Quik-Call™ Group Call	When a Quik-Call group call is received
A Group of High-Pitched Tones	Quik-Call Individual Call	When a Quik-Call individual call is received
Ringing	Phone Ringing	When a phone call is received
	Enhanced Call Received	When originator receives ACK from an enhanced private call

<i>Sound</i>	<i>Tone Name</i>	<i>Occurs:</i>
<i>Gurgle</i>	Dynamic Regrouping/ Over-The-Air Programming	When a dynamic ID has been received and the PTT button is pressed and the reprogrammed group has not been selected and when the radio is successfully re-keyed

Standard Accessories

Battery



To avoid a possible explosion:

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



If your radio is programmed with volatile-key retention (consult your service technician), encryption keys are retained for approximately 30 seconds after battery removal.

Battery Life

Battery life is determined by several factors. Among the more critical are the regular overcharge of batteries and the average depth of discharge with each cycle. Typically, the greater the overcharge and the deeper the average discharge, the fewer cycles a battery will last. For example, a battery which is overcharged and discharged 100% several times a day, lasts fewer cycles than a battery that receives less of an overcharge and is discharged to 50% per day. Further, a

battery which receives minimal overcharging and averages only 25% discharge, lasts even longer.



WARNING

Care should be taken to avoid external short circuiting of the battery. A sustained high-rate discharge (for example, a paper clip placed accidentally across the battery contacts) may permanently damage the battery, void the battery warranty, and create a burn or fire hazard.

Charging the Battery

Motorola batteries are designed specifically to be used with a Motorola charger and vice versa. Charging in non-Motorola equipment may lead to battery damage and void the battery warranty.

The battery should be at about 77°F (25°C) (room temperature), whenever possible. Charging a cold battery (below 50° F [10°C]) may result in leakage of electrolyte and ultimately in failure of the battery. Charging a hot battery (above 95°F [35°C]) results in reduced discharge capacity, affecting the performance of the radio. Motorola rapid-rate battery chargers contain a temperature-sensing circuit to ensure that batteries are charged within the temperature limits stated above.



WARNING

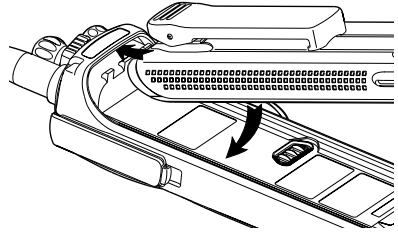
Do not attempt to change or charge the battery in a hazardous atmosphere.

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 user guide for details.

Attaching the Battery

To attach the battery:

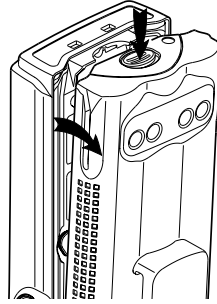
- 1 Turn off the radio and hold it with the back of the radio facing upward.
- 2 Align the three slots at the top of the battery with the three tabs on the back of the radio.
- 3 Push the battery down toward the radio until the battery clicks into place.



Remove the Battery

To remove the battery:

- 1 Turn the radio off.
- 2 Hold the radio with the back of the radio facing upward.
- 3 To release the battery from the radio, push the battery release button located on the bottom of the battery.
- 4 Lift the battery away from the radio and remove.



Note: If your radio is programmed with volatile-key retention, encryption keys are retained for approximately 30 seconds after battery removal. Consult a qualified radio technician for details.

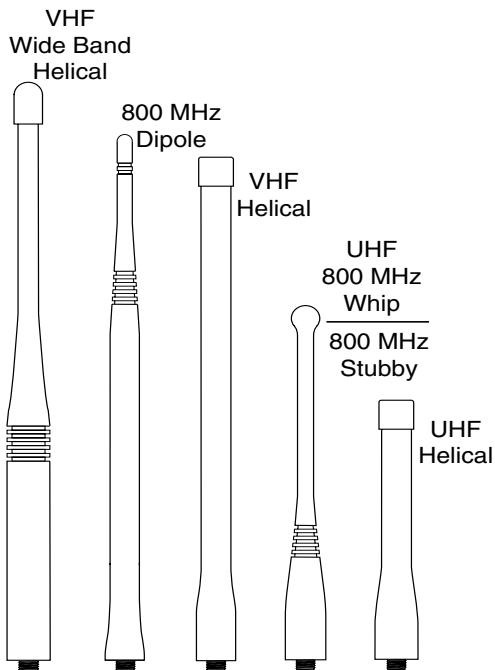
Antenna

Radio Operating Frequencies

Before installing the antenna, ensure that the antenna you have can be used with your radio. Your radio's model number is on a label attached to the back of your radio. A typical model number might be H09UCC9PW5AN. The fourth position of the model number (in this example, U) identifies the operating-frequency band of the radio. The following table lists all fourth-position alpha characters and corresponding frequency band.

Fourth Position	Operating Frequency	Fourth Position	Operating Frequency
K	136-178MHz	R	403-470MHz
S	450-512MHz	U	806-870MHz

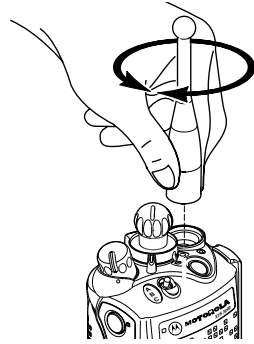
Antennas are frequency sensitive and are color coded according to the frequency range of the antenna. The color code indicator is in the center of the base of the antenna. The following illustrations and table helps identify the antenna, antenna frequency range, and corresponding color code.



Antenna Identification Table					
Antenna Type	Approx. Length		Insulator Color Code	Frequency Range	Antenna Kit No.
	in.	mm			
VHF Wide Band Helical	8.1	203	RED	136-174MHz	NAD6563
VHF Helical	7.8 7.3 6.9	195 183 172	YELLOW BLACK BLUE	136-151MHz 151-162MHz 162-174MHz	NAD6566 NAD6567 NAD6568
UHF Helical	3.3 3.2 3.2	83 80 79	RED GREEN BLACK	403-435 MHz 435-470MHz 470-512MHz	NAE6546 NAE6547 NAE6548
UHF Wide Band Whip	5.2	130	GREY	403-512MHz	NAE6549
800MHz Whip	7	175	RED	806-870MHz	NAF5037
800MHz Dipole	8	200	RED	806-870MHz	NAF5039
800MHz Stubby, Quarterwave	3.3	83	WHITE	806-870MHz	NAF5042

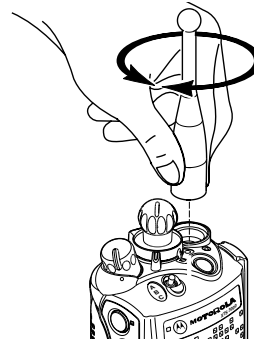
Attach the Antenna

With the radio turned off, turn the antenna clockwise to attach it to the radio.



Remove the Antenna

With the radio turned off, turn the antenna counter-clockwise to remove it from the radio.

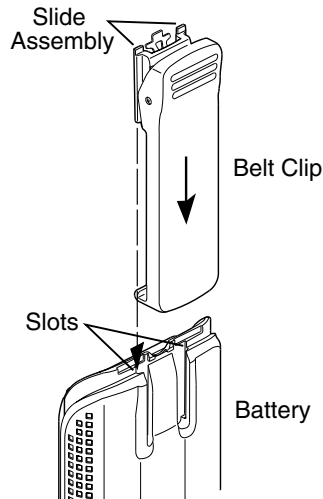


Belt Clip

Note: The battery must be removed from the radio before the belt clip can be installed or removed.

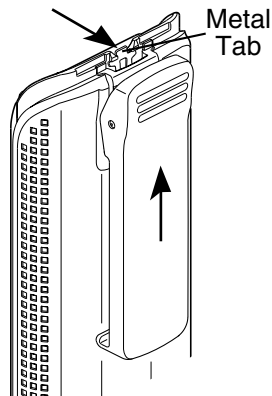
Attach the Belt Clip

- 1 Holding the battery in one hand so that the top of the battery faces upward and the back of the battery faces you, hold the belt clip in the other hand with its top facing upward.
- 2 Align the slide assembly on the front of the belt clip with the slots on the back of the battery. Slide the belt clip downward toward the bottom of the battery until the belt clip clicks in place.



Remove the Belt Clip

- 1 Hold the battery in one hand so that the top of the battery faces upward, and the front (radio side) of the battery faces you.
- 2 At the top of the battery, press down on the belt clip's metal tab and slide the belt clip upward. Continue to slide the belt clip upward until it is free from the battery.



Universal Connector Cover

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

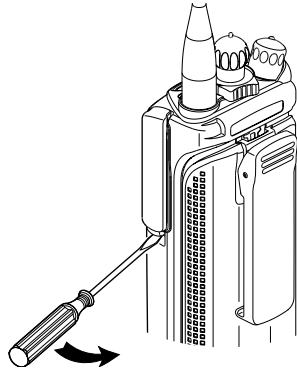
Remove the Connector Cover



Caution

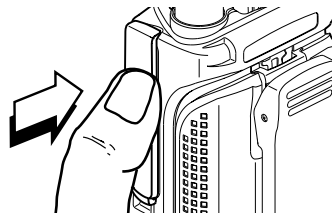
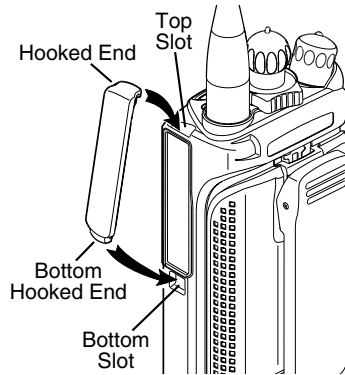
When the Universal Connector is not in use, keep it covered with the Universal Connector cover to prevent damage.

- 1 Turn the radio off.
- 2 *While holding the cover's top (flat) end in place with your thumb, pry upward on the cover's lower end until it disengages from the radio.*



Attach the Connector Cover

- 1 Turn the radio off.
- 2 Insert the top, hooked end of the cover into the top of the connector slot.
- 3 While holding the top end, swing the rounded end into place at the bottom of the connector. Press firmly until it snaps into place.



XTS 3000 R Radios Only

Note: In XTS 3000 R radios, the “R” signifies the radio is a **Rugged**-type radio designed to withstand adverse field conditions such as being submersed in water



Caution

- The XTS 3000 R radio casing has a vent hole that allows for pressure equalization in the radio. Never poke this vent with any objects, such as needles, tweezers or screwdrivers. This creates a leak path into the radio and the radio’s submersibility is lost.
- The pressure equalization vent is located on the chassis, just below the battery contact. Never obstruct or cover the two slots with any object, including a label. Ensure that no oily substances come in contact with this vent.
- The XTS 3000 R radio is designed to be submersed to a maximum depth of 6 feet and a maximum submersion time of 4 hours. Exceeding either maximum limit may result in damage to the radio.

Note:

- 1 If the radio has been submersed in water, shake the radio well to remove any water that may be trapped inside the speaker grille and microphone port. Otherwise, the water could cause decreased audio capabilities.
- 2 If the radio’s battery contact area has been exposed to water, dry and clean battery contacts on both the radio and the battery before attaching the battery to the radio. Otherwise, the water could short-circuit the radio.
- 3 If the radio has been submersed in a corrosive medium (such as salt water), rinse the radio and battery in fresh water and dry the radio and battery.

- 4** To clean the exterior surfaces of the radio, use a diluted solution of mild dish washing detergent and fresh water (one teaspoon of detergent to one gallon of water).
- 5** Do not disassemble the radio. This could damage radio seals and result in leak paths into the radio. Radio maintenance should be performed only by a qualified service person.
- 6** Elastomer technology materials used for seals in rugged portable radios can age with time and environmental exposure. Therefore, Motorola recommends that rugged radios be checked annually to assure the water-tight integrity of the radio. Radio disassembly and reassembly procedures and information regarding test equipment necessary to inspect, maintain and troubleshoot radio seals can be found in the XTS 3000 ASTRO 25 Basic Service manual.

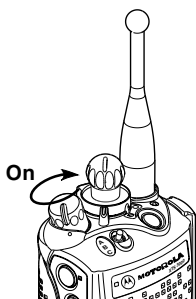
General Radio Operations

Your radio is ready for use after a fully-charged battery and an antenna have been connected to the radio. Refer to pages 4 and 5 to ensure a complete understanding of the radio's controls and indicators.

Turning the Radio On and Off

Radio On

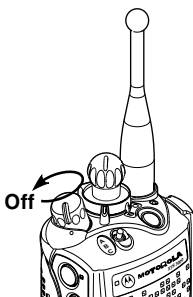
Turn the radio on by rotating the **On/Off/Volume Control Knob** *clockwise*. The radio goes through a power-up self test, and the display shows "Self Test."



If the radio fails the self test, the display shows "ERROR XX/YY," where XX/YY is an alphanumeric code. Turn the radio off, check the battery, and turn the radio back on. If the radio still does not pass its self test, record the "ERROR XX/YY" code and contact your system manager or authorized service technician.

Radio Off


Turn the radio off by rotating the **On/Off/Volume Control Knob** *counterclockwise* until you hear a click.

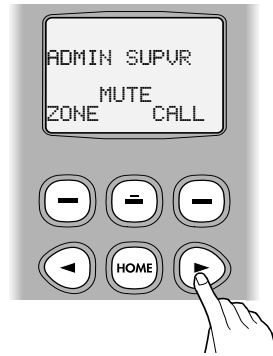


Selecting a Zone and Channel

A *zone* is a grouping of channels. A *channel* is a group of radio characteristics such as transmit/receive frequency pairs. After you turn your radio on, select the desired zone and channel.

Zone Selection

- 1 Press  until the ZONE softkey appears on the display. (The exact location of softkeys will vary based upon individual radio programming.)



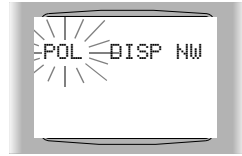
OR

Place the **Zone Switch** (if programmed, see page 4) to the desired position. Then go to step 4.


- 2 Press  directly below ZONE.



The display changes to show the current zone name (flashing) and the channel name (on steady). In the example shown, "POL" = Zone; "DISP NW" = Channel.




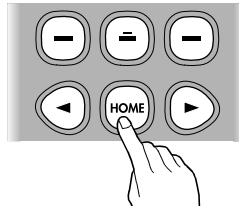
Zone = Flashing
Channel = On Steady

- 3 Press  until the desired zone name appears on the display.



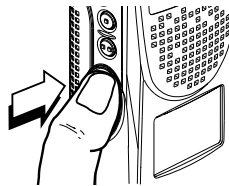
Note: If the selected zone is not programmed, the display will show "UNPROGRAMMED" until a valid programmed zone is selected. This does not mean your radio is not programmed, only that the zone you selected is not programmed.

- 4 To select the displayed zone/
channel combination, press
.



OR

To transmit on the displayed
zone/channel combination,
press the **PTT Button**.



Note: *If you would like a different channel within the selected zone,*
see “Channel Selection” below.

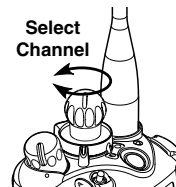
Channel Selection

Consult your service technician to determine which one of the
following methods to use for channel selection.

Method 1


This method is used when the **16-Position Select Knob** is
programmed for channel selection.

Once you have a desired zone
displayed (step 3 of zone selection),
rotate the **16-Position Select Knob** to
the desired channel. The display
changes to show the selected
channel.



Method 2

This method is used when a softkey is programmed for channel selection.

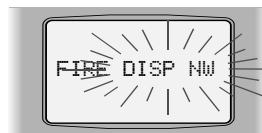
- 1 Press  until the CHAN softkey appears on the display.




- 2 Press  directly below CHAN.



The display changes to show the zone name (on steady) and the current channel name (flashing). In the example shown, "FIRE" = Zone, "DISP NW" = Channel.




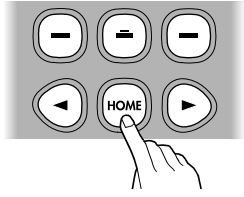
Zone = On Steady
Channel = Flashing

- 3 Press  until the desired channel name appears on the display.



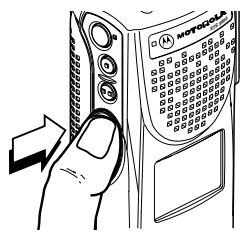
Note: If the selected channel is not programmed, the display will show “UNPROGRAMMED” until a valid programmed channel is selected. This does not mean your radio is not programmed, only that the channel you selected is not programmed.

- 4 When the displayed zone/channel combination is acceptable, press .



OR

To transmit on the displayed zone/channel combination, press the **PTT Button**.



Receiving/Transmitting

After you have turned your radio on and selected the desired zone and channel, you can receive (listen to) or transmit (send) communications as follows:

- 1 Listen until you hear a transmission.

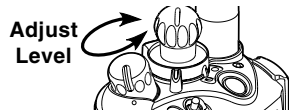
OR

Press the **Volume Set Button** (if programmed, see page 4) to hear the volume set tone.

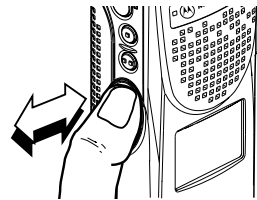
OR

Press the **Monitor Button** (if programmed, see page 4) to listen for activity. See **Notes** below.

- 2 Adjust the **Volume Control Knob** until volume is at a comfortable listening level.




- 3 To transmit, press and hold the **PTT Button** and speak clearly into the microphone. The LED will continuously light red while the radio is transmitting. When you have finished talking (transmitting), release the **PTT Button** to listen (receive).



Transmit = Press & Hold PTT Button

Receive = Release PTT Button

Notes:

- *For Conventional Mode* — If the channel on which you are transmitting is programmed to receive Private-Line® (PL), ensure that the channel is not in use by momentarily pressing the **Monitor Button** (if programmed, see page 4) to listen for activity. The Carrier Squelch status indicator () will be displayed when the **Monitor Button** is activated.

To put the radio in permanent monitor operation (squelch defeat), press and hold the **Monitor Button** for five seconds (time programmable through radio service software).

To return the radio to its original squelch state, tap the **Monitor Button** again or press the **PTT Button**.

- If you try to transmit on a channel that is programmed for receive only, an invalid tone will sound until you release the **PTT Button**.


Using Lists

The “list” feature on your radio allows you to store commonly used numbers with an identifiable name.

The following general operations are available using lists:

- A preprogrammed list can be viewed.
- A specific member in a list can be selected.

Viewing a List

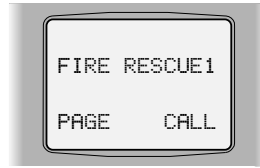
- 1 Press  until the VIEW softkey appears on the display. (The exact location of softkeys will vary based upon individual radio programming.)



- 2 Press  directly below VIEW.




The display changes to show available lists (example: PAGE, CALL); use ◀ or ▶ to see other available lists.




- 3 Press ⊖ directly below the list you wish to view. For example, to view the list of call numbers stored in your radio, press ⊖ directly below CALL.




The display will show the first member in the list (name on the upper line, number on the lower line). The  status indicator will appear (on steady), indicating you are in the view mode.




 On Steady = View Mode
(See page 8 for a description of all status indicators.)


- 4 Use ◀ or ▶ to view the members of the selected list.
- 5 Press (HOME) to exit the list viewing mode.


Selecting from a List

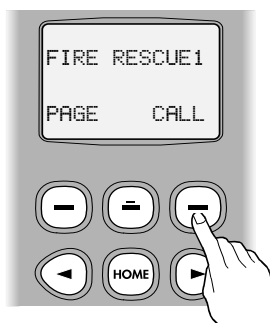
- 1 Press  until the feature you want appears as a softkey on the display.

For example, to select from calls stored in your radio, press  until the softkey appears on the display. (The exact location of softkeys will vary based upon individual radio programming.)

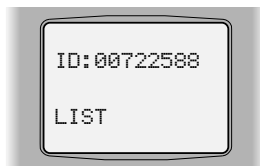


- 2 Press  directly below the desired feature.

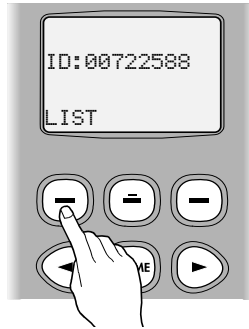
Using the same example in step 1, press  directly below CALL.



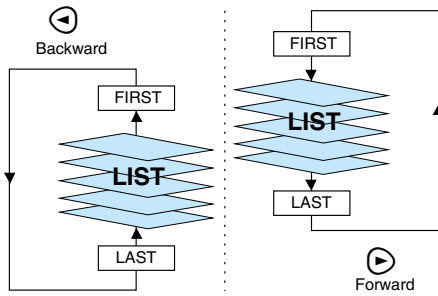
The display changes to show the last call received. The LIST softkey also appears.



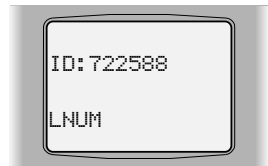
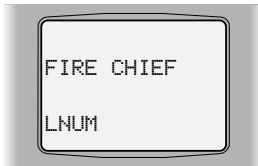
- 3 To access the preprogrammed list, press **⊖** directly below LIST.



- 4 Scroll through the preprogrammed list by pressing **◀** or **▶** until you locate the desired member's name/number.



The display will alternate between the name and number of a member in the list.



Note: Pressing ⊖ directly below the LNUM softkey, will take you to the Last **NUM**ber dialed or the Last ID **NUM**ber transmitted/received.



General Radio Features

Muting the Keypad Tones



The radio's keypad tones, normally heard each time a keypad key is pressed, can be turned OFF (muted) or ON (unmuted) at your discretion.

Muting Keypad Tones Using the Keypad-Mute Switch:

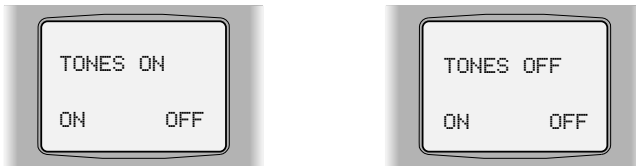
Note: The **Keypad-Mute Switch** is programmable through radio service software.

- 1 To turn the keypad tones OFF, put the **Keypad-Mute Switch** in the "tones off" position.
- 2 To turn the keypad tones ON for normal operation, put the **Keypad-Mute Switch** in the "tones on" position.


Muting Keypad Tones Using the Softkey Feature:

- 1 Press  until the MUTE softkey appears on the display.
- 2 Press  directly below MUTE.

The display changes to show the current mute state:
"TONES ON" = tones unmuted; "TONES OFF" = tones muted.



- 3 Press  below the desired mute state (ON or OFF).

Note: Pressing  or the **PTT Button** will exit this display menu without changing the keypad tones muting selection.


Time-Out Timer

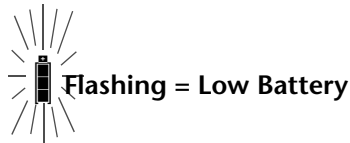
The new ASTRO portable radio is equipped with a programmable time-out timer which, upon expiration, will turn off the transmitter. This timer is programmable by your system manager or service technician using radio service software, and can be set from 0 seconds (off) to 7.75 minutes (465 seconds), at 15-second increments. ASTRO radios have been programmed at shipment with a default time-out timer duration of 60 seconds.

- A time-out timer warning occurs approximately four seconds before the allocated time-out timer expires. The warning is a short, low-pitched tone.
- If the **PTT Button** is held down longer than the time-out timer's allotted time, a continuous, low-pitched tone will sound and the LED will stop lighting red, indicating that your transmission has been cut off. This tone will continue to sound until the **PTT Button** is released.

1. Release the **PTT Button**.
2. To transmit another message, press the **PTT Button**.

Low-Battery Indication

If the battery voltage falls below the low-voltage level, the  status indicator will appear (flashing).



Note: If a low-battery indication occurs, replace the battery.

Additional programmable battery status options include the following:

- When the **PTT Button** is pressed, the bicolor LED will blink red to indicate a low-battery condition.
- When the **PTT Button** is released following a transmission, a short, high-pitched tone (chirp) will sound to indicate a low-battery condition.
- When the radio is in the standby mode and a low-battery condition occurs, an alert tone will sound from 30 to 930 seconds (programmable through radio service software) at 30-second increments.

Common Radio Features


Conventional Squelch Options

Analog Squelch Options


Tone Private-Line® (PL), Digital Private-Line™ (DPL), network ID, and carrier squelch operations are all available in your radio and can be programmed by your system manager or service technician for each channel.

Note: Network ID is only available on ASTRO “digital” channels (consult your service technician).

When in carrier squelch operation, all traffic on the channel is heard. When in PL, DPL, or network ID operation, your radio responds only to those messages intended for you. PL, DPL, network ID, and carrier squelch can be programmed for each channel.

Whenever the radio is operating in carrier squelch, the display will show the  status indicator.



 On Steady = Carrier-Squelch Operation

Project 25 Digital Squelch Options

Each conventional personality may be programmed for one of the following squelch options in digital mode (consult your service technician):

Digital Carrier-Operated Squelch (COS) — This option will allow the radio to hear any received digital Project 25 voice traffic.

Normal Squelch — This option will allow the radio to hear any digital Project 25 voice traffic that has the correct Network access code.


Selective Squelch — This option will allow the radio to hear any digital Project 25 voice traffic that has the correct Network access code and the correct talkgroup.

Note: Your radio’s squelch level can be reprogrammed at an authorized service facility.

Data Calls (Trunked Radios Only)

This feature allows you to send data calls (status calls) from your radio to the dispatcher to indicate a predefined condition. Each defined status can have a 12-character alias. You can have the following maximum number of predefined conditions: 16 message conditions, 16 status conditions for conventional, eight status conditions for trunking.


Sending a Status Call

- 1 Press  until the STS softkey appears on the display.



OR

Press the **Status Button** (if programmed, see page 4). This will take you directly to step 3.

- 2 Press  directly below the type of data call you want to make.

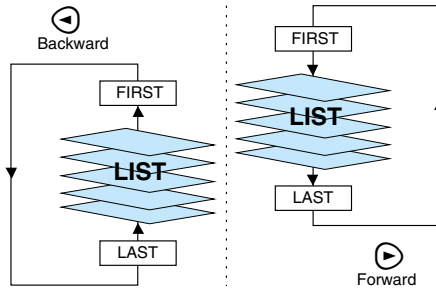
STS for Status Call



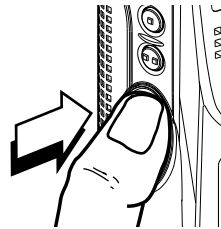
The last acknowledged status call will be displayed.

Note: If no status has been acknowledged, the first status in the status list will be displayed.

- 3 Scroll through the list by pressing ◀ or ▶ until you locate the predefined condition you want to send.



- 4 When you locate the condition you want to send, press the **PTT Button**.




Upon receipt of the data call, the dispatcher will transmit an acknowledge to your radio. Your radio will then beep four times, display "ACK RECEIVED," and then return to normal dispatch operation.




If the system does not acknowledge the data call, your radio will display the currently selected, predefined condition on line 1 and "NO ACKNOWLEDG" on line 2.



- 5 Press  to exit the data-call feature and return to the home display.

Notes:

- While the data-call feature is selected, you will not hear normal radio communication on trunked channels.
- If the data-call feature (STS) is selected and no activity occurs for six seconds, an alert tone will sound to indicate to you that the data-call feature is active. The alert tone will stop when  or the **PTT Button** is pressed.

Emergency

For radios programmed with the emergency feature, pressing the **Emergency Button** (if programmed, see page 4) will send out an emergency signal that takes precedence over any other signalling activity in progress on the selected channel. There are two types of emergency signals:

- **Emergency Alarm** sends a data transmission to alert the dispatcher to an emergency condition and identify the radio sending the emergency signal.
- **Emergency Call** is a type of dispatch operation that gives your radio priority access to channels (not available on conventional radios).

Note: “Emergency” signals a critical situation. It should never be used for any other reason.

Entering the Emergency State

Press and hold the **Emergency Button** (if programmed, see page 4).

The display alternates between showing “EMERGENCY” and the current zone/ channel combination (except for silent-emergency alarm. See Silent Emergency Alarm below).



Emergency Alarm

During a non-silent emergency alarm state:

- the LED will light,
- a group of short, medium-pitched tones will be heard, and
- when the emergency alarm is acknowledged by the dispatcher, the radio sounds four beeps and the alarm ends .

Silent-Emergency Alarm

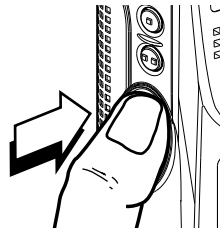
During a silent-emergency state:

- the LED will not light,
- tones will not be heard, and
- the audio will be muted (turned off) and will remain so until you exit emergency alarm state.

The silent-emergency state will continue until you press the **PTT Button**.

Emergency Call

To send an Emergency Call, press the **PTT Button**.



Notes:

- **For all types of emergency signals** — If you change channels during emergency operation, the emergency alarm or call will be moved to, and continue on, the new channel if the new channel is also programmed for emergency operation. If the new channel is not programmed for emergency operation, an invalid-mode tone will sound until the radio exits emergency state, or you change to a channel programmed for emergency operation.
- **For emergency-alarm with emergency-call signals** — Once an acknowledgment is received from the dispatcher, your radio will enter emergency-call state.

- **For emergency-call signals** — While your radio is in emergency-call state, it operates in the usual dispatch manner.

OR

If programmed to do so, your radio will return to one of the following operations:

Tactical/Non-Revert Operation — You talk on the channel you selected before entering the emergency state.

Non-Tactical/Revert Operation — You talk on a preprogrammed emergency channel, and the emergency alarm will also be sent to this preprogrammed emergency channel.

Exiting the Emergency State

It is important that you exit emergency state when you no longer need to stay in that state. There are four ways to exit emergency state:

- 1 Press the **Emergency Button** for approximately one second (this time is programmable through radio service software); a medium-pitched, emergency-exit tone sounds until the button is released and the radio returns to normal operation.
- 2 *Radios programmed with emergency alarm* — Press the **PTT Button**. The alarm will be canceled (without an emergency-exit tone), and you may begin transmitting your voice call.
- 3 *On radios equipped with emergency alarm with call* — Press the **PTT Button** while the radio is in emergency-alarm operation to place the radio in emergency-call operation.
- 4 *Radios programmed with emergency alarm only* — The radio automatically exits emergency state on receiving an acknowledgment from the dispatcher or if the alarms are exhausted when no acknowledgment is received. This method applies to non-silent emergency alarm radios.

Note: If you have a silent-emergency alarm radio, use method 1, 2, or 3 to exit the emergency alarm state.

Emergency Keep-Alive



When this feature is enabled, moving the **On/Off Control Knob** to the OFF position will not turn your radio off if it is in an emergency state. Your radio will continue normal emergency operation as if the power is on. The radio will not turn power off until it exits emergency state.

Conventional Talkgroup Calls (Conventional Project 25 Operation Only)

Project 25 replaces Motorola's group selective calls with talkgroup calls. This feature allows you to define talkgroups for your conventional system. Talkgroups, combined with selective squelch operation, allow groups of users to transparently share a conventional channel. Talkgroups may be slaved to a personality using the radio service software (RSS), or you may select them.

Encryption keys are slaved to talkgroups. When talkgroups are enabled, encryption keys are changed by changing the active talkgroup. See "Secure Operation" on page 69.

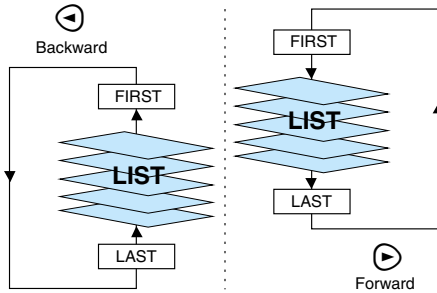
Talkgroup Selection

- 1 Press  until the TGRP softkey appears on the display.
- 2 Press  directly below TGRP.

The display changes to show the last user-selected-and-stored talkgroup and the available softkey selections.



- 3 Press ◀ or ▶ to scroll through the talkgroups.



- 4 Press ⊖ directly below one of the following softkey options to complete the selection of your talkgroup:

PSET (PRESET) — Selects the preset or radio service software programmed talkgroup.

SEL (SELECT) — Saves the currently displayed talkgroup and returns to the home display.

If the encryption key slaved to the new talkgroup is erased, “KEY FAIL” will be displayed and a momentary “key fail” tone will be generated.



If the encryption key that is slaved to the new talkgroup is not allowed, “ILLEGAL KEY” will be displayed and a momentary “illegal key” tone will be generated.



- 5 Press ◻ or the **PTT Button**, or turn the **16-Position Select Knob** to exit this menu.

Individual Calls (APCO Trunking Only)


Individual calls are defined as follows:

- **Telephone Calls** — Similar to standard telephone calls, except you use your radio. These calls can be landline-to-radio, or radio-to-landline calls.
- **Enhanced Private Conversation Calls (Enhanced Private Calls, Trunked Channels Only)** — The radio automatically verifies that the target radio is active on the system. The target radio user can also view the ID of the calling radio before answering.
- **Call Alert™ Pages** — Your radio functions like a pager (beeper). Call Alert Pages provide a means to signal other radio users that you wish to get in touch with them (even if they are away from their radio or in a noisy environment). Call Alert Pages also allow users to verify that the radio they are calling is active on the system.

Quick Access (One-Touch)

If your radio is programmed for Quick Access (One-Touch), you can initiate a call to *one* preprogrammed phone number or ID number without having to use the “Selecting the Feature (Phone, Private Call, Call Alert)” and “Selecting a Phone Number or ID Number” menus. This means that you start at “Initiating the Phone Call, Private Call, or Call Alert” on page 50.

Selecting the Feature (Phone, Private Call, Call Alert)



- 1 Press  until one of the following softkeys appear on the display:

PHON for a *Telephone Call*

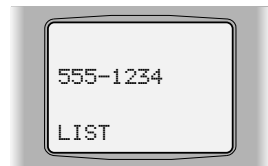
CALL for a *Private Conversation Call*

PAGE for a *Call Alert Page*



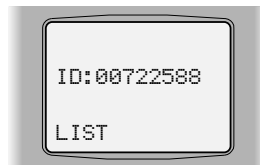
- 2 Press  directly below the desired softkey feature. For example, to make a private call, press  directly below CALL.

For Phone — The display changes to show the last transmitted phone number.



OR

For Private Conversation Call and Call Alert — The display changes to show the ID number of the last call/page transmitted/received.





- 3 Go to the section “Selecting a Phone Number or ID Number” on page 50.

Selecting a Phone Number or ID Number

For Phone — The display shows last transmitted phone number.

For Private Conversation Call and Call Alert — The display shows the ID number of the last call/page transmitted/received.

- 1 Use  or  to scroll to the desired phone/ID number in the Phone, Private Call, or Call Alert list.
- 2 Go to the section “Initiating the Phone Call, Private Call, or Call Alert” on page 50.

Initiating the Phone Call, Private Call, or Call Alert

For Phone — The display shows the desired phone number.

For Private Conversation Call and Call Alert — The display shows the desired ID number.

- 1 Press the **PTT Button** to initiate the Phone Call/Call Alert/Private Call to the Phone/ ID number on the display.

OR

Press the “Quick-Access” (one-touch) **Phone, Private Call, or Call Alert Button**. This initiates the call to the preprogrammed Phone/ID number.

For Phone — The phone number being called will remain on the display.

If the system does not acknowledge the call, your radio will display “NO ACKNOWLEDG.”

Private Call — The display shows the called ID number momentarily, then changes to “PLEASE WAIT.”

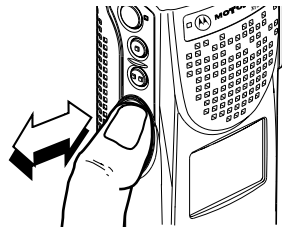
- Once connected, the display changes to show the called ID number.
- If the system does not acknowledge the call, your radio will display “NO ACKNOWLEDG.”
- If the target radio user does not respond to the Private Call before the time-out, your radio will display “NO ANSWER.”

For Call Alert — The display changes to “PLEASE WAIT.”

- Once connected, the display changes to show home display.
- If the system does not acknowledge the call, your radio will display “NO ACKNOWLEDG.”

Notes: *For phone only* —

- If the phone system is malfunctioning, or not currently available, then when the **PTT Button** is pressed, the display will change to “NO PHONE,” and the radio will sound a continuous tone.
 - If the phone system is busy, and not available at all, then the display will show “PHONE BUSY.” If the radio is sounding a continuous tone, then the system phone connection is busy, and you should exit phone mode and try again.
 - If the display shows “PHONE BUSY” and the radio is sounding a busy tone, then there is no channel available, and the radio will automatically connect when the channel is ready.
- 2 If the party you are calling answers, converse in the normal manner. Press the **PTT Button** to talk; release the **PTT Button** to listen.



- Note:** Motorola trunked radios generate a high-pitched tone when the radio's **PTT Button** is released. This is heard by the landline party and is an indicator to begin talking.
- 3 When you have finished your conversation, or if the display shows “NO PHONE” or “NO ACKNOWLEDG,” hang up (disconnect) by pressing (HOME) or the **Phone Button**.
The radio will return to the home display.

Answering an Individual Call

When an individual call is being received, you will hear and/or see:

- a telephone-type ringing if it is a telephone call;
- two alert tones if it is a Private Conversation Call;
- a continuous cycle of four tones if it is a Call Alert Page;
- a blinking green signal on the LED;
- the 🎵 indicator flashing; and
- one of the following on the display:



Telephone Call

Private Conversation Call

Call Alert Page

- 1 *Telephone Calls Only* — Within 20 seconds, press the preprogrammed **Call Response Button**.

Private Conversation Calls — Within 20 seconds of receiving the call, press the **Call Response Button**.

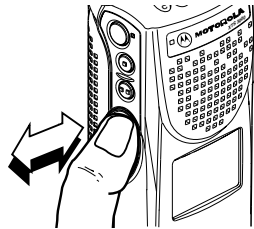
The display will show the caller's ID number. Press the **PTT Button** to talk privately.

Call Alert Pages Only — To see the caller's ID, press ⊖ directly below the **PAGE** softkey.

If you wish to respond, press the **PTT Button** and your conversation will be heard by the entire talkgroup.

- 2 Converse in the normal manner. Press the **PTT Button** to talk; release the **PTT Button** to listen.


Talk = Press & Hold
PTT Button
Listen = Release
PTT Button



- 3 *For Telephone Calls and Private Calls Only* — When you have finished your conversation, “hang up” (disconnect) by pressing **HOME**. The radio will return to the home display.

PL Defeat

The PL defeat feature allows you to override any coded squelch (DPL, PL, or network ID) that may be programmed to a channel. To activate this feature, place the **PL Defeat Switch** (if programmed, see page 4) in the PL defeat position. You will then be able to hear any activity on the channel; if no activity is present, the radio is muted.


The Carrier Squelch status indicator  will be displayed if the feature is active.

Repeater/Direct

The repeater/direct feature allows you to bypass the repeater and talk directly to another radio. This is known as DIRECT operation or talkaround operation. The transmit frequency is the same as the receive frequency.

In REPEATER operation, you talk through the repeater, which increases the radio’s operating range. The transmit frequency is not the same as the receive frequency.

Selecting Repeater or Direct Operation

- 1 Press  until DIR appears on the display.



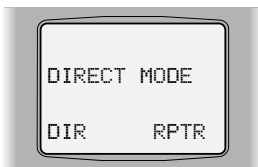
OR

Place the Repeater/Direct Switch (if programmed, see page 4) in the “repeater position or the “direct” position.

- 2 Press  directly below DIR.




The display will show the current operation for a few seconds and then the two possible operations.



OR



- 3 Press  below the desired operation (DIR or RPTR).

Note: Pressing  or the **PTT Button** will exit this display menu without changing the current operation

Scan



 = Scan Feature Active

The scan feature allows you to monitor activity on different channels by scanning a “scan list.” Each radio can have up to 20 different scan lists. The channels to be scanned can be programmed by your system manager or radio technician using radio service software, or manually if your radio is configured to allow user-programming of scan lists.

Three types of scan lists are available (consult your service technician for additional information):

- **Trunking Priority Monitor** — Comprises channels that are all from the same trunking system (10 different channels maximum). This feature will work only on systems that support it.
- **Conventional** — Comprises only conventional channels (15 different channels maximum).
- **Talkgroup Scan** — Comprises conventional and trunked channels from one trunking system (10 different channels maximum). Priority operation is not available in this type of list.

There are also several types of scanning available:

- **Priority-One Scanning** — With priority-one scanning enabled, one member of the scan list is chosen as the priority-one member. Any activity on the priority-one channel will be heard on the speaker even if another channel in the scan list has activity on it.



 (Flashing Dot) = Priority-One Channel


- **Priority-Two and Non-Priority Scanning** — In addition to the priority-one channel being the number one priority, a second channel can be assigned as a priority-two channel, if desired. The remaining members in the scan list can be programmed as non-priority members of the scan list.



 (Dot On Steady) = Priority-Two Channel

- **Automatic Scanning (Autoscan)** — When selected, a channel with autoscan will automatically begin scanning its associated scan list. The radio will continue auto scanning until you select a channel that does not have autoscan enabled.
- **Operator-Selectable Scan** — Scan can be programmed by your system manager or service technician to be activated by a softkey-related button or a **Scan On/Off Switch** (if programmed, see page 4).

Turning Scan On and Off

- 1 Press  until SCAN appears on the display.



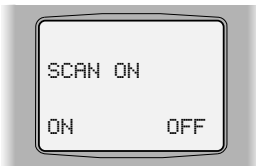
OR

Place the **Scan On/Off Switch** (if programmed, see page 4) in the “scan on” position or the “scan off” position.

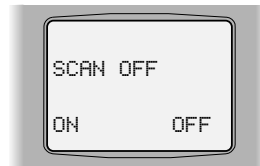
- 2 Press  directly below SCAN.



The display will show the current scan state.



OR



- 3 Press (⊖) below the desired scan state (ON or OFF). When the scan feature is on (active), the scan indicator (Z) is displayed.

Note: Pressing (HOME) or the **PTT Button** will exit this display menu without changing the scan activity state.

Deleting Nuisance Channels

When the radio scans to a channel that you do not wish to hear (nuisance channel), you can temporarily delete the channel from the scan list.

When the radio is locked onto the channel to be deleted, press the **Nuisance-Delete Button** (if programmed, see page 4). Repeat this step to delete additional nuisance channels.

Note: Priority channels, the designated transmit channel, and the selected channel cannot be deleted using the nuisance-delete feature.

The radio continues scanning the remaining channels in the list. To resume scanning the deleted channel, you can change channels or leave and re-enter scan operation.

Dynamic Priority Change (Conventional Operation Only)

While the radio is scanning, the dynamic priority change feature allows you to *temporarily* change any channel in a scan list (except the priority-one channel) to the priority-two channel. The present priority-two channel becomes a non-priority channel. This change remains in effect until scan is turned off, then scanning reverts back to the preprogrammed state.

When the radio is locked onto the channel to be designated as priority-two, press the **Dynamic Priority Button** (if programmed, see page 4).

Note: The priority-one channel cannot be changed to priority-two.

The radio continues scanning the remaining channels in the list. To resume scanning the preprogrammed priority-two channel, you must leave and re-enter scan operation.

Viewing a Scan List

The “view scan list” feature allows you to view the members of the scan list associated with the currently selected channel. You view a scan list the same way you view other lists (see “Viewing a List” on page 31).

Scan List Empty


If the scan list assigned to the current mode has NO entries, the display will show the “empty list” condition.

Turning scan off, or adding scan list entries with Radio Service Software or scan list programming via the keypad, will end the empty list display.



Programming a Scan List



Note: Scan list members must be set to “Operator Selectable” in the Radio Service Software to allow the scan list programming feature.

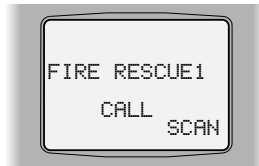
- 1 Press  until the PROG softkey appears on the display.



- 2 Press  directly below PROG.




The display changes to show the lists (CALL, SCAN, etc.) that can be changed; use  or  to see other available lists.

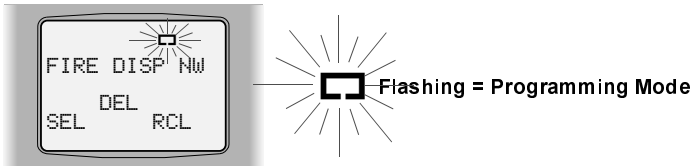


- 3 Press  directly below SCAN.



Note: If SCAN does not appear on the display, your radio may be configured so that scan list programming is entered using a switch. Move the switch to the scan list programming position to enter scan list programming mode.

The display will show the first member in the list. The  status indicator will appear (flashing), indicating you are in the programming mode.



- 4 Press  below the desired state (SEL or DEL).





SEL = add currently displayed channel to the scan list

DEL = delete currently displayed channel from the scan list

OR

Press the **Select Button** (the **Top Side Button**) to change the scan-list status of the currently displayed channel.

Notes: Each press of the SEL softkey-related button, or the programmed **Select Button** (the **Top Side Button**), will cause one of the following to occur:

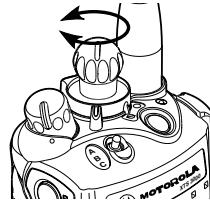
- The scan indicator () will appear to indicate that this channel has been added to the scan list.
- A “•” will be displayed next to the scan indicator () to indicate that this channel is the *priority-two* channel.
- A flashing  will be displayed next to the scan indicator () to indicate that this channel is the *priority-one* channel.
- The scan indicator will turn off to indicate that this channel has been removed from the scan list.

Note: The priority indicator “•” will only be displayed if the list being edited allows priority members in the scan list.

- 5 Use ◀ or ▶ to select additional modes to be added or deleted from the scan list.

OR

Rotate the **16-Position Select Knob** to select additional modes to be added or deleted from the scan list.



Note: Depending on the manner in which the radio was field-programmed, the arrow buttons/**16-Position Select Knob** will select either zones or channels.

The entire contents of the scan list, as currently programmed, can be viewed by repeatedly pressing the **RCL** softkey. This may cause a mismatch between the displayed mode and the **16-Position Select Knob**'s position. To rectify this, reposition the **16-Position Select Knob** and the display will be updated.

- 6 Press **HOME** to exit the scan list programming mode (or move the switch programmed for scan list programming away from the scan list programming mode position).

Notes: The following notes are dependent upon your radio's programming; consult you service technician.

- A maximum of 16 channels can be added to the scan list (including the selected channel). If you try to add more than 16 channels to the scan list, the radio will sound an invalid tone to indicate the scan list is full.
- Whenever a new priority-one channel is assigned, the radio will automatically cancel the old priority-one channel assignment (radio service software programmable).

- Whenever a new priority-two channel is assigned, the radio will automatically cancel the old priority-two channel assignment (radio service software programmable).

Smart PTT (Conventional Only)

Smart PTT is a per-channel, programmable feature used in conventional radio systems to keep radio users from interrupting other radio conversations. When smart PTT is enabled in your radio, you will not be able to transmit on an active channel. If you try to transmit (press the **PTT Button**) on an active smart-PTT channel, an alert tone will be generated, and the transmission will be inhibited. The LED will also blink red to indicate that the channel is busy.

Three radio-wide variations of smart PTT are available:

- **Transmit Inhibit on Busy Channel with Carrier** — When this feature is enabled, you will be prevented from transmitting if any activity is detected on the channel.
- **Transmit Inhibit on Busy Channel with Wrong Squelch Code** — When this feature is enabled, you will be prevented from transmitting 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 will not be prevented.
- **Quick-Key Override** — This feature can work in conjunction with either of the two above variations. With this feature enabled, you will be able to override the transmit-inhibit state by quick-keying the radio; in other words, two **PTT Button** presses within the time programmed through radio service software (RSS) for **Smart PTT Quick-Key Timer** (default value is 1/2 a second).

Notes

Special Radio Features

Dynamic Regrouping (Trunking APCO Project 25 Operation Only)

The dynamic regrouping feature allows the dispatcher to temporarily reassign selected radios to a single special channel so that they can communicate with each other. This feature, enabled in each radio by your system manager or service technician, is typically used during special operations is typically used during special operations. You will not notice whether your radio has this feature enabled until a dynamic regrouping command is sent by the dispatcher.

Note: If you select the dynamic-regrouping zone/channel using softkeys or other radio controls without being dynamically regrouped, an invalid tone will be heard.

When your radio has been dynamically regrouped, you will hear a “gurgle” tone and your radio will be automatically switched to the dynamic-regrouping channel. The display will show the name assigned to the dynamic-regrouping channel.

Note: If you are using a radio control knob or switch (not softkeys) to select the zone or channel —
Until you select the correct dynamic-regrouping position, you will not be able to select scan or the Private Conversation Call feature, the display remains in the dynamic mode, and you will hear a “gurgle” tone each time you press the **PTT Button**. This is a reminder to you that you are transmitting on the dynamic regrouping channel, not the zone or channel indicated by the position of the radio control.

However, the dispatcher may classify regrouped units into one of two categories: “select enabled” or “select disabled.” *Select-enabled* units are free to make mode changes to any of the available talkgroups, including the dynamic group. Once the user has selected the dynamic regrouping position, *select-disabled* units cannot change modes because the dispatcher has specifically chosen to force the unit to remain in the dynamic mode.


Talk and listen as usual.

*For Radios Using **Only Softkeys** for Zone **and** Channel Selection —*
When the dynamic regrouping is canceled by the dispatcher, the radio will automatically return to the original softkey zone and channel before the radio was dynamically regrouped.

*For Radios Using **Knobs or Switches** for Zone **and/or** Channel Selection —*
When the dynamic regrouping is canceled by the dispatcher, the radio will automatically return to the present knob/switch zone and/or channel position and the original softkey zone or channel selection.

Reprogram Request

This feature allows you to notify the dispatcher that you want a new dynamic-regrouping assignment.

- 1 Press  until the **RPGM** softkey appears on the display.


OR

Press the **Reprogram Request Button** (if programmed, see page 4). Then go to step 3.

- 2 Press  directly below **RPGM**.


The display changes to show “REPRGRM RQST,” and the reprogram request is automatically sent to the dispatcher.



- 3 If you hear one beep, press the **PTT Button** to resend the reprogram request again, or press  to hang up and return to the home display.

OR

If you hear five beeps, the reprogram request was acknowledged by the dispatcher, and your radio will return to the home display.

Note: If the dispatcher fails to acknowledge the reprogram request within six seconds, a low-pitched alert tone sounds and the display shows “RPRGRM RQST” on line 1 and “NO ACKNOWLDG” on line 2. Try again or press .

Select Enable/Disable

The dispatcher may classify regrouped radios into either of two categories: select enabled or select disabled.

- Select-enabled radios are free to make channel changes to any available channel, including the dynamic-regrouping channel, once the user has selected the dynamic regrouping position.
- Select-disabled radios cannot change channels since the dispatcher has specifically chosen to force the radio to remain on the dynamic-regrouping channel.

Note: The scan or Private Conversation Call feature cannot be selected while your radio is select disabled.


PTT-ID Receive

The PTT-ID receive feature allows you to see the radio ID number of the radio you are currently receiving. This ID can be a maximum of eight characters and can be viewed by both the receiving radio and the dispatcher.

PTT-ID Transmit



The PTT-ID transmit feature is a per-channel feature in which your radio's ID number is automatically sent every time the **PTT Button** is pressed. For analog voice transmissions, depending upon how your radio was programmed, your radio's ID can be transmitted at the beginning of a transmission, at the end of a transmission, or at the beginning and ending of a transmission. For digital voice transmissions, your radio's ID is sent continuously during the voice message.

Viewing Your Radio's ID Number

- 1 Press  until the CALL or PAGE softkey appears on the display.

OR

Press the **Call Button** or **Page Button** (if programmed, see page 4). Then go to step 3.

- 2 Press  directly below CALL or PAGE.
- 3 Press .

The display changes to show your radio's ID.

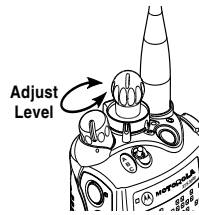


Secure Operation

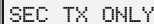
Note: Secure operation provides the highest level of commercially available voice security on trunked or conventional channels. Unlike other forms of security, Motorola digital encryption provides signalling that makes it virtually impossible for others to decode any part of an encrypted message.

Selecting Secure or Clear Transmissions

Use the **Secure/Clear Switch** (if programmed, see page 4) to select secure or clear operation of the radio before initiating a transmission using the **PTT Button**. This selection cannot be made when a transmission is in progress.



- If a channel is programmed for secure-only operation, and the **Secure/Clear Switch** is in the clear (○) position, when the **PTT Button** is pressed, the display will show "SEC TX ONLY," an invalid-mode tone will sound, and the radio will not transmit until the **Secure/Clear Switch** is set to the secure (⊗) position.

A rectangular display screen with a thin border, showing the text "SEC TX ONLY" in a simple, monospaced font. The screen is centered on a light gray background.

SEC TX ONLY

- *If a channel is programmed for clear-only operation, and the **Secure/Clear Switch** is in the secure (⊗) position, when the **PTT Button** is pressed, the display will show “CLR TX ONLY,” an invalid-mode tone will sound, and the radio will not transmit until the **Secure/Clear Switch** is set to the clear (○) position.*



Note: This is not the case when the radio is programmed using the RSS to “Ignore TMSS on Sec/Clr Strapped Channel.”

Managing Encryption

KEY Loading

- Refer to the key-variable loader (KVL) manual for equipment connections and setup.
- When the KVL is attached to your radio, the display will show “KEYLOADING,” and all other radio functions, except for power down, backlight, and volume, will be locked out.
- When the key has been loaded successfully into your radio, the radio will sound a short tone for single-key radios; for multikey radios, an alternating tone will be heard.





MultiKEY

The multikey feature allows your radio to be equipped with as many as 16 different encryption keys and supports up to two different encryption algorithms simultaneously (for example, DVP-XL™ and DES-XL; or DVP™ and DVI-XL™ or DES-OFB).



- **Conventional Multikey** — The encryption keys can be tied (strapped), on a one-per-channel basis, through radio service software. In addition, you can have operator-selectable keys, operator-selectable indexes, and operator-selectable key erasure. If talkgroups are enabled in conventional, then the encryption keys are strapped to the talkgroups.
- **Trunked Multikey** — If you use your radio for both conventional and trunked applications, you will have to strap your encryption keys for trunking on a per-talkgroup or announcement-group basis. In addition, you may strap a different key to other features (for example, dynamic regrouping, failsoft, or emergency talkgroup). You can have operator-selectable key erasure.

KEY Selection

- 1 Press  until the KEY softkey appears on the display.
- 2 Press  directly below KEY.

The display changes to show the last user-selected and stored encryption key and the available softkey selections.




- 3 Press  or  to scroll through the encryption keys.

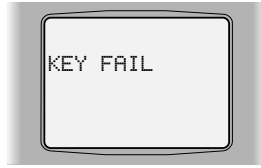
Note: If an erased key is selected, the key name will be alternated with “ERASED KEY.”

- 4 Press  directly below the desired softkey.

PSET or “PRESET” = selects the preset or default encryption key.

SEL = saves the newly-selected key and returns to the home display.

- 5 Press , the **PTT Button**, the **ABRT** softkey, or turn the **16-Position Select Knob** to exit this menu. If the selected key is erased, "KEY FAIL" will be displayed and a momentary "key fail" tone will be generated.





If the selected key is not allowed, "ILLEGAL KEY" will be displayed and a momentary "illegal key" tone, similar to the "key fail" tone, will be generated.



Index Selection (Conventional Only)

The select-an-index feature allows you to select one or more groups of several encryption keys from among the available keys stored in the radio. For example, you could have a group of three keys structured to one index, and another group of three different keys structured to another index; by changing indexes, you would automatically switch from one set of keys to the other. Every channel to which one of the original keys was tied to will now have the equivalent new key instead.

- 1 Press  until the **INDX** softkey appears on the display.
- 2 Press  directly below **INDX**.

The display changes to show the last user-selected and stored index and the available index softkey selections.



- 3 Press  directly below the desired index.

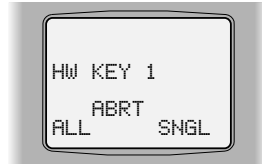
- 4 To save the newly selected index, press \ominus below SEL. The radio will then exit index selection and return to the home display.

Note: Pressing $\text{\textcircled{HOME}}$ or the **PTT Button** or turning the **16-Position Select Knob** will exit this display menu without changing the index selection.

KEY Erasure (KEY Zeroization) — Method 1 (Multikey Only)

- 1 Press $\text{\textcircled{▶}}$ until the ERAS softkey appears on the display.
- 2 Press \ominus directly below ERAS.

The display changes to show the last user-selected and stored encryption key and the available softkey selections.



- 3 Press \ominus directly below the desired softkey.

ALL = erases all the encryption keys in the radio. The display shows "ERS ALL KEYS" and YES and NO for erase confirmation.

ABRT = exits this menu and returns to the home display.

SNGL = selects the displayed encryption key to be erased. The display shows "ERS SNGL KEY" and YES and NO for erase confirmation.

Press $\text{\textcircled{◀}}$ or $\text{\textcircled{▶}}$ to scroll through the encryption keys. The display changes to show the new selection on the upper line.

- 4 Press $\text{\textcircled{HOME}}$, the **PTT Button**, the ABRT softkey, or turn the **16-Position Select Knob** to exit this menu.

KEY Erasure (All KEYS Erased) — Method 2

Note: This is the method used for erasing the key in radios with the “single key” option.

With the radio on, press and hold the **Top Side Button**. While holding this button down, press the **Emergency Button**.

Note: **DO NOT** press the **Emergency Button** before pressing the **Top Side Button** unless you are in an emergency situation; this would send an emergency alarm.



Before the keys are erased, the display will show “PLEASE WAIT.” When all the encryption keys have been erased, the display will show “ERASED.”



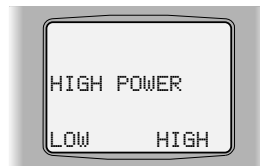
Selectable Power Level


This feature allows you to select the power level at which your radio will transmit messages.

Note: When the radio is powered on, it will default to the setting programmed through radio service software.

- 1 Press  until the PWR softkey appears on the display.
- 2 Press  directly below PWR.

The display changes to show the current power-level state.




- 3 Press  directly below the desired power level. The new transmit power-level is saved, and your radio returns to the home display.

LOW = shorter transmitting distance; conserves battery life

HIGH = longer transmitting distance; lessens battery life

Notes:

- Pressing  or the **PTT Button** will exit this display menu without changing the power selection.
- Pressing the **TX Power Level** switch will set the power level to low. Once you have selected low power, the opposite switch position will switch the radio to high power.

Trunking System Controls

Failsoft

If a trunking system experiences a complete failure, the radio will indicate failsoft operation and automatically switch to its failsoft channel. During failsoft, the trunking repeaters will transmit a medium-pitched tone every 10 seconds. When the trunking system returns to normal operation, your radio will automatically exit failsoft operation and return to trunked operation.




Out of Range

If you go out of range of the system and can no longer lock onto a control channel, the display will show "OUT OF RANGE" and the currently selected zone/channel combination, and/or sound a low-pitched tone. Your radio will remain in this out-of-range condition until it (1) locks onto a control channel, (2) locks onto a failsoft channel, or (3) the radio is turned off.




Site Lock

This feature allows your radio to lock onto a specific site and not roam among wide-area talkgroup sites. This feature should be used with caution since it inhibits roaming to another site in a wide-area system.

- 1 Press  until the `SITE` softkey appears on the display.


OR

Press the **Site Lock/Unlock Button** (if programmed, see page 4). The site lock status will be displayed momentarily. To toggle the site lock status, hold down the button until the new status is displayed.

- 2 Press  directly below `SITE`.

The display changes to show the current lock state.



- 3 Press  directly below the desired condition (`LOCK` or `UNLK`). The new site-lock state is saved, and your radio returns to the home display.

Site Trunking

If the zone dispatcher loses communication with any site, that site will revert to what is known as "site trunking." Your radio will display "SITE TRUNKING" and the currently selected zone/channel combination. When this occurs, you will only be able to communicate with other radios within your trunking site.



Site View and Change

Viewing the Current Site

Momentarily press the **Site Search Button** (if programmed, see page 4).

The display will show the number of the current site and its corresponding Received Signal Strength Indicator (RSSI) or, if the radio is scanning for a new site, the display will show "SCANNING SITE" until it locks onto a new site.

Changing the Current Site

Press and hold down the **Site Search Button** (if programmed, see page 4) to manually force the change to a new site.

You will hear a tone, and the display will show "SCANNING SITE" while the radio scans for a new site. Then the radio automatically returns to the home display.



Notes

Helpful Hints

Troubleshooting

If you suspect a radio problem, check the following items before requesting service:

Radio Checks

- Be sure the radio is turned on and the **16-Position Select Knob** is in the proper position.
- Replace or recharge the battery. The first time a new battery is used, it should charge a minimum of 16 hours.
- The antenna must be screwed on properly, with its base flush against the top of the radio.
- Could your radio problem be caused by accessories improperly connected?
- Try operating the radio from several different locations, especially when using the radio inside buildings.
- Check the transmitter by transmitting to an alternate portable radio.

Operating Instructions

Review your operating instructions and ensure that you are using the radio properly.

Problem Not Solved

If, after checking your radio and operating instructions, your radio still has a problem, contact your system manager, or review your service agreement and call the applicable Motorola service representative, as applicable. If you do not have a service agreement on your radio, contact your nearest authorized Motorola service shop for guidance toward a prompt and expedient evaluation and/or repair.

Radio Care

Handling

- Avoid physical abuse; do not pound, drop, or throw the radio unnecessarily. Do not carry the radio by the antenna.
- Avoid subjecting the radio to an excess of liquids. Never allow the radio to become submersed.
- Avoid subjecting the radio to corrosives, solvents, or spirits.
- Do not disassemble the radio in any way.
- Keep the accessory-connector cover in place until ready to use the accessory connector. Replace the cover immediately after the accessory has been disconnected.

Cleaning

Clean external surfaces of your radio with the following solution: one teaspoon of mild dishwashing detergent to one gallon of water (0.5% solution).



Caution

Do not use solvents to clean your radio; spirits may be harmful and permanently damage the radio housing.

Apply the detergent solution sparingly with a stiff, non-metallic, short-bristled brush, being careful not to allow excess detergent to remain entrapped near connectors and controls or in cracks and crevices. Do not submerge the radio in the detergent solution. Dry the radio thoroughly with a soft, lint-free cloth.

Clean all battery contacts with a lint-free cloth to remove dirt, grease, or other foreign material that may prevent good electrical connections.

Battery Charging and Disposal

Charging Batteries

This product is powered by a nickel-cadmium (Ni-Cd), nickel-metal-hydride (NiMH), or lithium-ion rechargeable battery. Charge the battery before use to ensure optimum capacity and performance. The battery was designed specifically to be used with a Motorola charger. Charging in non-Motorola equipment may lead to battery damage and void the battery warranty.

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

The battery should be at about 77°F (25°C) (room temperature), whenever possible. Charging a cold battery (below 50° F [10°C]) may result in leakage of electrolyte and ultimately in failure of the battery. Charging a hot battery (above 95°F [35°C]) results in reduced discharge capacity, affecting the performance of the radio. Motorola rapid-rate battery chargers contain a temperature-sensing circuit to ensure that batteries are charged within the temperature limits stated above.

Recycling Batteries

Batteries may be recycled. However, recycling facilities may not be available in all areas. Under various U.S. state laws and the laws of several other countries, batteries must be recycled or disposed of properly and cannot be disposed of in landfills or incinerators.

Contact your local waste management agency for specific requirements and information in your area.

Motorola fully endorses and encourages the recycling of batteries. In the U.S. and Canada, Motorola participates in the nationwide Rechargeable Battery Recycling Corporation (RBRC) program for battery collection and recycling. Many retailers and dealers participate in this program.

Helpful Hints

For the location of the drop-off facility closest to you, access RBRC's Internet website at www.rbrc.com or call 1-800-8-BATTERY. This internet site and telephone number also provide other useful information concerning recycling options for consumers, businesses, and governmental agencies.

Glossary

ACK	Acknowledgment of communication
APCO	Association of Public Safety Communication Officers
Channel	A group of characteristics such as transmit/receive frequency pairs, radio parameters, and encryption encoding
Control Channel	In a trunking system, one of the channels that is used to provide a continuous, two-way/data communications path between the central controller and all radios on the system
Conventional	Typically refers to radio-to-radio communications, sometimes through a repeater; does not use a trunking (controller) system (See Trunking)
Cursor	A visual tracking marker (a blinking line) that indicates a location on the display
Dispatcher	An individual who has radio system management duties
FCC	Federal Communications Commission
Hang Up	Disconnect
Home Display	The first display information after the radio completes its self test
Landline Caller	Someone communicating through the public telephone system
LCD	Liquid Crystal Display
Page	A one-way alert, with audio and/or display messages
PTT	Push-To-Talk - the PTT Button engages the transmitter and places the radio in transmit (send) operation when pressed
Radio-To-Landline	Communicating from a portable/mobile radio through the telephone system.
Repeater	A conventional radio feature, where you talk through a receive/transmit facility (repeater) that retransmits received signals in order to improve communications range and coverage
RF	Radio Frequency

Softkeys	Features shown on the display with a key-like outline - selection of these features is controlled by the ⊖ and ⊕ buttons
Squelch	The muting of audio circuits when received signal levels fall below a predetermined threshold
Standby	An operating condition whereby the radio's speaker is muted but still continues to receive data
Talkgroup	An organization of radio users who communicate with each other
Trunking	The automatic sharing of communications paths between a large number of users (See Conventional)
Zone	A grouping of channels

Commercial Warranty

Limited Warranty

MOTOROLA COMMUNICATION PRODUCTS

I. WHAT THIS WARRANTY COVERS AND FOR HOW LONG:

MOTOROLA INC. (“MOTOROLA”) warrants the MOTOROLA manufactured Communication Products listed below (“Product”) against defects in material and workmanship under normal use and service for a period of time from the date of purchase as scheduled below:

XTS 3000 ASTRO 25 Portable Units	One (1) Year
Product Accessories	One (1) Year

Motorola, at its option, will at no charge either repair the Product (with new or reconditioned parts), replace it (with a new or reconditioned Product), or refund the purchase price of the Product during the warranty period provided it is returned in accordance with the terms of this warranty. Replaced parts or boards are warranted for the balance of the original applicable warranty period. All replaced parts of Product shall become the property of MOTOROLA.

This express limited warranty is extended by MOTOROLA to the original end user purchaser only and is not assignable or transferable to any other party. This is the complete warranty for the Product manufactured by MOTOROLA. MOTOROLA assumes no obligations or liability for additions or modifications to this warranty unless made in writing and signed by an officer of MOTOROLA. Unless made in a separate agreement between MOTOROLA and the original end user purchaser, MOTOROLA does not warrant the installation, maintenance or service of the Product.

MOTOROLA cannot be responsible in any way for any ancillary equipment not furnished by MOTOROLA which is attached to or used in connection with the Product, or for operation of the Product with any ancillary equipment, and all such equipment is expressly excluded from this warranty. Because each system which may use

the Product is unique, MOTOROLA disclaims liability for range, coverage, or operation of the system as a whole under this warranty.

II. GENERAL PROVISIONS:

This warranty sets forth the full extent of MOTOROLA'S responsibilities regarding the Product. Repair, replacement or refund of the purchase price, at MOTOROLA's option, is the exclusive remedy. THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED TO THE DURATION OF THIS LIMITED WARRANTY. IN NO EVENT SHALL MOTOROLA BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT, FOR ANY LOSS OF USE, LOSS OF TIME, INCONVENIENCE, COMMERCIAL LOSS, LOST PROFITS OR SAVINGS OR OTHER INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE SUCH PRODUCT, TO THE FULL EXTENT SUCH MAY BE DISCLAIMED BY LAW.

III. STATE LAW RIGHTS:

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION OR EXCLUSIONS MAY NOT APPLY.

This warranty gives specific legal rights, and there may be other rights which may vary from state to state.

IV. HOW TO GET WARRANTY SERVICE:

You must provide proof of purchase (bearing the date of purchase and Product item serial number) in order to receive warranty service and, also, deliver or send the Product item, transportation and insurance prepaid, to an authorized warranty service location. Warranty service will be provided by Motorola through one of its authorized warranty service locations. If you first contact the company

which sold you the Product, it can facilitate your obtaining warranty service. You can also call Motorola at 1-888-567-7347 US/Canada.

V. WHAT THIS WARRANTY DOES NOT COVER:

- A) Defects or damage resulting from use of the Product in other than its normal and customary manner.
- B) Defects or damage from misuse, accident, water, or neglect.
- C) Defects or damage from improper testing, operation, maintenance, installation, alteration, modification, or adjustment.
- D) Breakage or damage to antennas unless caused directly by defects in material workmanship.
- E) A Product subjected to unauthorized Product modifications, disassemblies or repairs (including, without limitation, the addition to the Product of non-Motorola supplied equipment) which adversely affect performance of the Product or interfere with Motorola's normal warranty inspection and testing of the Product to verify any warranty claim.
- F) Product which has had the serial number removed or made illegible.
- G) Rechargeable batteries if:
 - any of the seals on the battery enclosure of cells are broken or show evidence of tampering.
 - the damage or defect is caused by charging or using the battery in equipment or service other than the Product for which it is specified.
- H) Freight costs to the repair depot.
- I) A Product which, due to illegal or unauthorized alteration of the software/firmware in the Product, does not function in accordance with MOTOROLA's published specifications or the FCC type acceptance labeling in effect for the Product at

the time the Product was initially distributed from MOTOROLA.

- J) Scratches or other cosmetic damage to Product surfaces that does not affect the operation of the Product.
- K) Normal and customary wear and tear.

VI. PATENT AND SOFTWARE PROVISIONS:

MOTOROLA will defend, at its own expense, any suit brought against the end user purchaser to the extent that it is based on a claim that the Product or parts infringe a United States patent, and MOTOROLA will pay those costs and damages finally awarded against the end user purchaser in any such suit which are attributable to any such claim, but such defense and payments are conditioned on the following:

- A) that MOTOROLA will be notified promptly in writing by such purchaser of any notice of such claim;
- B) that MOTOROLA will have sole control of the defense of such suit and all negotiations for its settlement or compromise; and
- C) should the Product or parts become, or in MOTOROLA's opinion be likely to become, the subject of a claim of infringement of a United States patent, that such purchaser will permit MOTOROLA, at its option and expense, either to procure for such purchaser the right to continue using the Product or parts or to replace or modify the same so that it becomes non-infringing or to grant such purchaser a credit for the Product or parts as depreciated and accept its return. The depreciation will be an equal amount per year over the lifetime of the Product or parts as established by MOTOROLA.

MOTOROLA will have no liability with respect to any claim of patent infringement which is based upon the combination of the Product or parts furnished hereunder with software, apparatus or devices not furnished by MOTOROLA, nor will MOTOROLA have any liability for

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VII. GOVERNING LAW:

This Warranty is governed by the laws of the State of Illinois, USA.

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