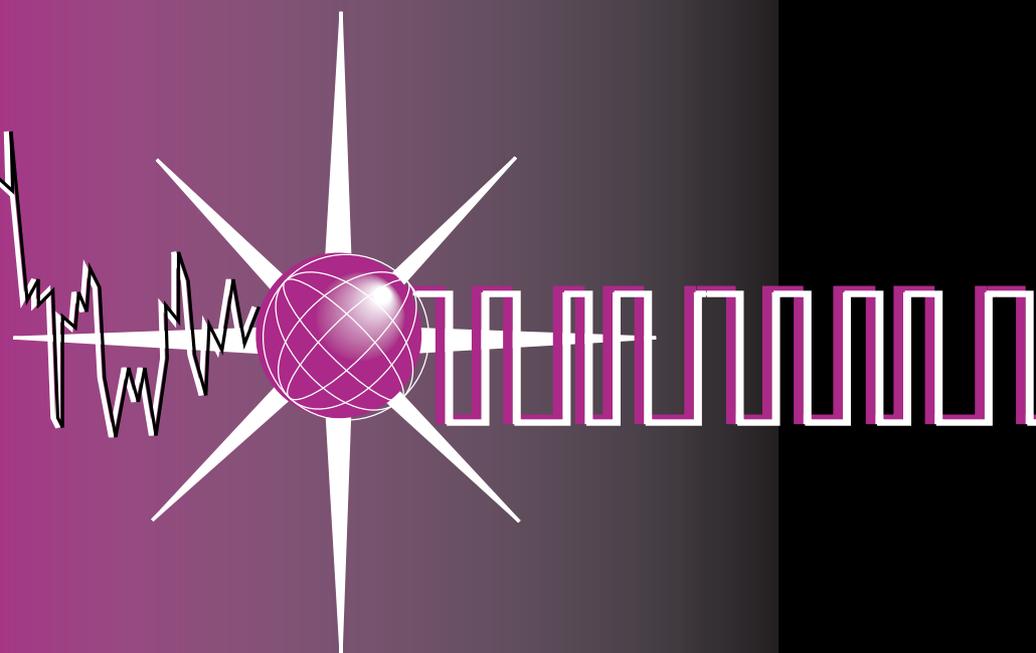**MOTOROLA**

ASTRO
DIGITAL SOLUTIONS

Digital XTS 3000
Basic Model

User's Guide

This manual describes how to operate an ASTRO Digital XTS 3000 Basic Model Portable Radio.

The basic model has no display and no keypad.

This manual first introduces you to your new radio. Then it covers general radio operation and commonly used radio features. Next, special radio features available on an ASTRO Digital XTS 3000 radio are described. The back section of this manual includes a glossary, an alert tone table, helpful tips, and an index.

Use this manual to become familiar with your ASTRO radio. But, <u>before operating your radio, please read and understand the "FCC Safety Standards" on the inside back cover of this manual.</u>

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 care must be taken or observed.

⚠ **WARNING** | **WARNING:** An operational procedure, practice, or condition, etc., which may result in injury or death if not carefully observed.

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

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

You will also notice the following special notations used to identify certain items.

<u>Example</u>	<u>Description</u>
Emergency Button	Buttons, switches, and knobs will be shown in bold print
OR	Signifies different steps with the same end result.
	Signifies different steps with a different end results.

ASTRO Digital XTS 3000

Portable Radio
Basic Model

Ⓜ, Motorola, ASTRO, XTS 3000, Private-Line, Digital Private-Line, Call Alert, MDC-1200, DVP, DVP-XL, Private Conversation, Call Alert, SmartZone, and Quik-Call are trademarks of Motorola, Inc.

User's Guide
68P81083C70-O

For information regarding Factory Mutual Approved models, options, and accessories, refer to the Factory Mutual Approved Supplement for ASTRO Digital XTS 3000 Radios (Motorola part number 68P81084C86).

Computer Software Copyrights

1
Introduction

Congratulations on your purchase of Motorola's leading edge in two-way radio communications; ASTRO, the digital solution.

ASTRO digital technology represents a revolution in two-way radio communication. With its expanded benefits and increased flexibility, an ASTRO digital system gives you an advanced new perspective on the way you communicate.

Motorola is committed to leadership in two-way radio communications for all types of private and public use. In addition to providing you with a wide range of analog solutions, Motorola is the leader in developing new digital solutions to serve you today and in the years ahead. ASTRO narrowband technology is the world's first digital two-way radio system. It offers many highly-sophisticated features previously unavailable for users of privately-owned systems, while maintaining compatibility with existing analog systems. Your ASTRO Digital XTS 3000 radio will provide you with many years of dependable service, with the quality and reliability that you expect from Motorola.

Inspection

Inspect the shipping carton for any signs of damage. Remove and check the contents to be sure that all ordered items have been shipped. Inspect all items thoroughly. If any items have been damaged during transit, report the damage to the shipping company immediately.

Radio Controls

Programmable Switches and Buttons

Refer to Table 1 for the features that are programmable, through radio service software (RSS), to the ASTRO Digital XTS 3000 radio controls. Then write, in the space provided below the appropriate switch or button on this page, the features that apply to your radio's programming (consult your service technician).

2-Position Concentric Switch

Top Button

3-Position A/B/C Switch

Top Side Button

Side Button 1

Side Button 2
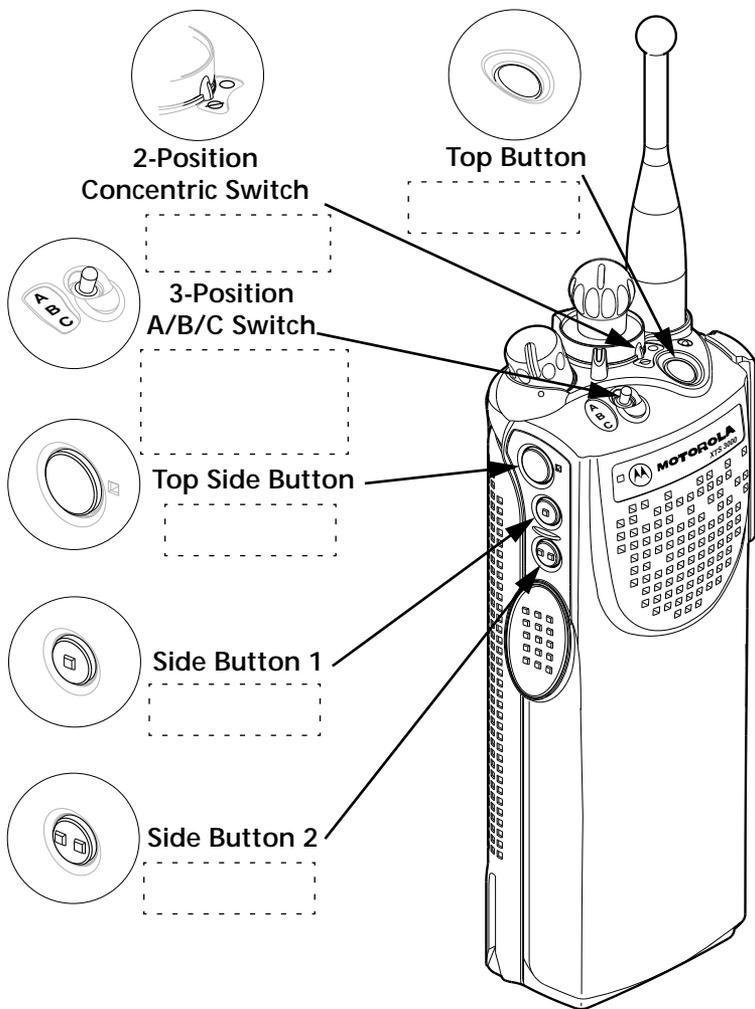
Table 1. Programmable Features	
Call Response (pg. 19)	Repeater/Direct (pg. 21)
Channel (pg. 12, 13)	Reprogram Request (pg. 26)
Dynamic Priority (pg. 23)	Scan On/Off (pg. 22, 23)
Emergency (pg. 15-17)	Secure/Clear (pg. 28)
Light (pg. 38)	Site Lock/Unlock (pg. 32)
Monitor (pg. 13)	Site Search (pg. 32)
Nuisance-Delete (pg. 23)	Tx Power-Level (pg. 30)
PL Defeat (pg. 20)	Volume Set (pg. 13)
Repeater/Direct (pg. 21)	Zone (pg. 12)

(pg.XX) = Page Number of Feature Description

Switches, Buttons, Knobs, and Indicators

Bicolor LED

Indicates the radio's operating status:
Red = Transmitting
Blinking Red = Channel Busy or Low
                          Battery (while transmitting)
Blinking Green = Receipt of Individual Call

Antenna
Radiates and receives
radio-frequency energy.

16-Position Select Knob
Selects the operating
system (zone) and/or
specific channel.

Microphone
Accepts audio.

On/Off/Volume Control Knob
Turns the radio on and off and
adjusts the volume level.

Speaker
Emits audio.

Push-To-Talk (PTT) Switch
Puts the radio in the
transmit (send) mode.

Battery
Rechargeable, 7.5Vdc
power source.

4

Antenna Installation and Removal

Before installing the antenna, ensure that the match between your radio and antenna is correct. 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.

Radio Operating-Frequency Table							
Fourth-Position	Operating Frequency	Fourth-Position	Operating Frequency	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 will help identify the antenna, antenna frequency range, and corresponding color code.
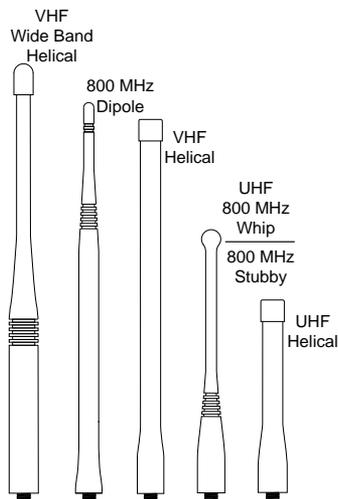
| Antenna Identification Table				
Antenna Type	Approx. Length	Insulator Color Code	Frequency Range	Antenna Kit No.
	in.	mm			
VHF Wide Band Helical	8.1	203	RED	136-174MHz	NAD6563
VHF Helical	7.8 7.3 6.9	195 183 172	YELLOW BLACK BLUE	136-151MHz 151-162MHz 162-174MHz	NAD6566 NAD6567 NAD6568
UHF Helical	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

To install the antenna, screw the threaded end of the antenna into the antenna receptacle on the top of the radio. Rotate the antenna *clockwise* until it seats firmly against the bushing.

To remove the antenna, rotate the antenna *counterclockwise* until its threaded end unscrews from the radio's antenna receptacle.
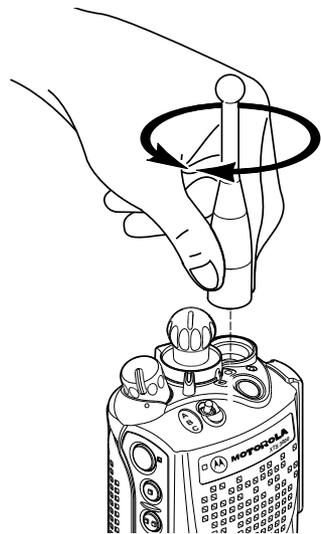
Battery Installation and Removal

⚠️ **WARNING**

To avoid a possible explosion:
DO NOT replace the battery in an area labeled "hazardous atmosphere."
DO NOT discard batteries in a fire.

⚠️ **CAUTION**

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

| Note | The battery is shipped uncharged, and must be charged before use. Refer to the "Battery Charging and Disposal" section on page 36. |

Installing the Battery

1. Turn off the radio and hold it with the back of the radio facing upward.

2. Insert the top edge of the battery into the area at the top of the radio between the radio's case and chassis. Make sure the three tabs on the radio chassis align with the three slots under the top edge of the battery.

3. Rotate the battery toward the radio, and squeeze the battery and radio together until the battery "clicks" in place.
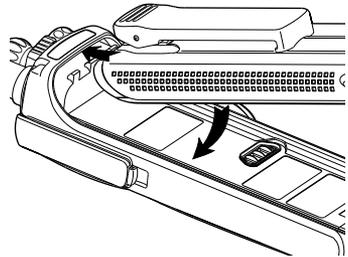
Removing the Battery

1. Turn off the radio and hold it so that the release button on the bottom of the battery is facing upward.

2. Press downward on the release button so that the battery disengages from the radio.

3. Remove the battery completely away from the radio

7
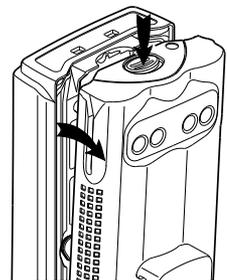
Belt-Clip Installation and Removal

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

Installing the Belt Clip

1. Hold the battery in one hand so that the top of the battery faces upward and the back of the battery faces you.

2. Holding the belt clip in the other hand with its top facing upward, align the slide assembly on the back of the belt clip with the slots on the back of the battery.

3. Slide the belt clip downward toward the bottom of the battery until the belt clip "clicks" in place.
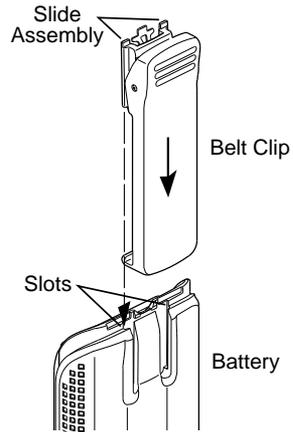
Removing the Belt Clip

1. Hold the battery (with belt clip installed) 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 until it disengages from the battery.

3. Continue to slide the belt clip upward until it is free from the battery.
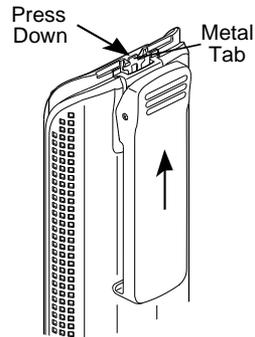
Universal Connector Cover Installation and Removal

⚠ CAUTION

When the universal connector is not in use, keep it covered with the universal connector cover.

Installing the Universal Connector Cover

1. Looking at the antenna side of the radio, insert the top (flat) hooked end of the cover into the slot on the top of the radio, above the universal connector. Press downward on the cover's top to seat it in the slot.

2. While holding the cover seated in the top slot, insert the cover's bottom (rounded) hooked end into the slot below the universal connector. Press firmly inward on the cover's bottom until it snaps in place.
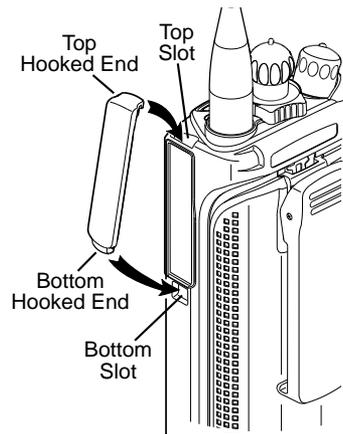
Removing the Universal Connector Cover

1. Looking at the antenna side of the radio, insert a flat-bladed screwdriver into the area between the lower end of the universal connector cover and the slot below the universal connector.

2. Pry upward on the cover's lower end until it disengages from the radio.

9

Notes
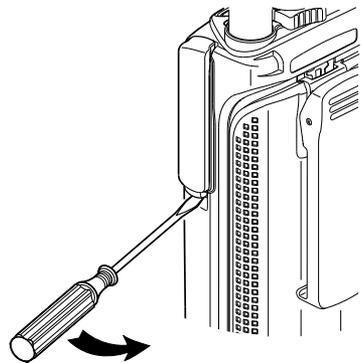
2

General Radio Operations

After a fully-charged battery and an antenna have been connected to the radio, you can begin operation. If necessary, refer to page 2 to ensure a complete understanding of the radio's controls and indicators. Also, for your convenience, the "Additional Information" section (starting on page 33) contains a glossary, alert tone table, helpful tips, and an index.

Turning the Radio On and Off

Radio On
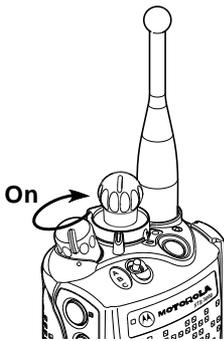
Turn the radio on by rotating the **On/Off/Volume Control Knob** *clockwise*.

The radio then goes through a power-up self test. When the radio passes the self test, a medium-pitched tone sounds. This tone is programmable through radio service software.

If the radio fails the self test, a low-pitched tone will sound. Turn the radio off, check the battery, and turn the radio back on. If the radio still does not pass its self test, contact your nearest authorized service technician.

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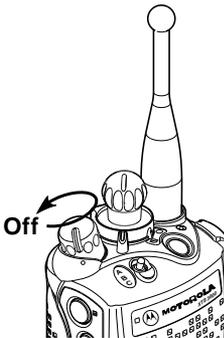
Turn the radio off by rotating the **On/Off/Volume Control Knob** *counterclockwise* until you hear a click.

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. Place the **Zone Switch** (if programmed, see page 2) to the desired position.

    Notes

*   If the selected zone is unprogrammed, you will hear a continuous, low-pitched tone (invalid-mode tone) until a valid programmed zone is selected. This does not mean your radio is unprogrammed, only that the zone you selected is unprogrammed.

*   *If you would like a different channel within the selected zone,* see "Channel Selection" on this page.

2. To transmit on the selected zone/channel combination, press the **PTT Switch**.

See page 2 for your radio's feature-control programming.
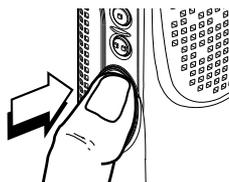
Channel Selection

1. Once you have a desired zone, *rotate* the **16-Position Select Knob** to the desired channel.

    Note   If the selected channel is unprogrammed, you will hear a continuous, low-pitched tone (invalid-mode tone) until a valid programmed channel is selected. This does not mean your radio is unprogrammed, only that the channel you selected is unprogrammed.
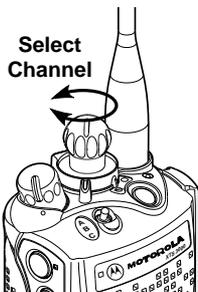
    Select Channel

2. To transmit on the selected zone/channel combination, press the PTT Switch.
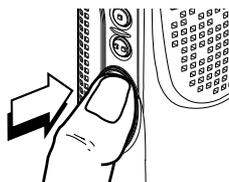
Receiving/Transmitting

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

1a. Listen until you hear a transmission.

OR

1b. Press the **Volume Set Button** (if programmed, see page 2) to hear the volume set tone.

See page 2 for your radio's feature-control programming.

OR

1c. Press the **Monitor Button** (if programmed, see page 2) to listen for activity. See notes below.

See page 2 for your radio's feature-control programming.
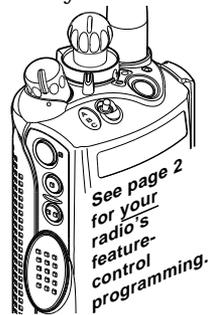
2. Adjust the **Volume Control Knob** for a comfortable listening level.

Adjust Level

3. To transmit, *press and hold* the **PTT Switch** and (with your mouth 2 to 3 inches away from the radio) 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 Switch** to listen (receive).
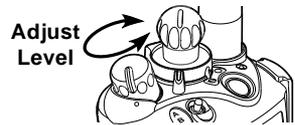
If you try to transmit on a channel that is programmed for receive only, an invalid tone will sound until you release the **PTT Switch**.

Transmit= Press & Hold PTT Switch
Receive= Release PTT Switch
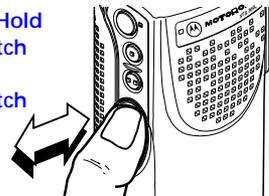
Note

• 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 2) to listen for activity. 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 Switch**.

See page 2 for your radio's feature-control programming.

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General Radio Features

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 through radio service software and can be set from 0 seconds (off) to 7.75 minutes (465 seconds), at 15 second increments. The ASTRO radios have been programmed at shipment for 60 seconds.

1. A time-out timer warning occurs approximately four seconds before the allocated time-out timer expires. The warning is a short, low-pitched tone.

2. If the **PTT Switch** 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 Switch is released.

3. Release the **PTT Switch**.

4. To transmit another message, press the **PTT Switch**.

Low-Battery Indication

If the battery voltage falls below the low-voltage level, a short, high-pitched chirping tone (low-battery chirp) will sound.

Once a low-battery indication occurs, replace the battery.

Programmable battery status options include:

*   When the **PTT Switch** is pressed, the bicolor LED will blink red to indicate a low-battery condition.

*   When the **PTT Switch** 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.

3

Common Radio Features

Emergency

For radios programmed with the emergency feature, pressing the **Emergency Button** (if programmed, see page 2) 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 which gives your radio priority access to channels in trunked radios.

| Note | "Emergency" signals a critical situation. It should never be used for any other reason. |

Entering the Emergency State

1. Press and hold the **Emergency Button** (if programmed, see page 2). The length of the press-and-hold time required is programmable through radio service software.

See page 2 for your radio's feature-control programming.

2a. Emergency Alarm	*2b. Silent-Emergency Alarm*	*2c. Emergency Call*
During a non-silent emergency alarm state:	During a silent-emergency state:	Press the **PTT Switch**.

OR   OR

2a.
- the LED will light,
- a short, medium-pitched tone will be heard,
- when the emergency alarm is acknowledged by the dispatcher, the radio sounds four beeps and the alarm ends.

2b.
- the LED will not light,
- tones will not be heard,
- the audio will be muted (turned off) and will remain so until you exit the emergency alarm state.

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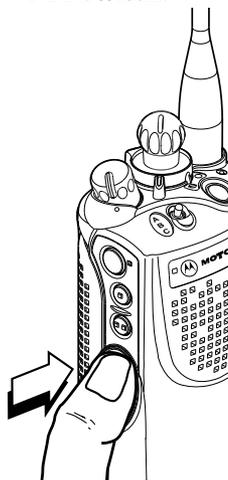
Note

- **For all types of emergency signals** — If you change channels while in 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 emergency state is exited, or you change to a channel programmed for emergency operation.

- **For emergency-alarm with emergency-call signals** — After receiving the acknowledgment from the dispatcher, your radio will enter the emergency-call state.

- **For emergency-call signals** — While your radio is in emergency-call state, it operates in the usual dispatch manner. Or, if enabled in your radio, your radio will return to one of the following operations:

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

  Non-Tactical/Revert Operation — you will 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 the emergency state when you have finished. There are four ways to exit the emergency state:

1. Press the **Emergency Button** for approximately 1 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* — the emergency alarm state may be exited by pressing the **PTT Switch**. 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* — pressing the **PTT Switch** while the radio is in emergency-alarm operation will place the radio in emergency-call operation.

4. *Radios programmed with emergency alarm only* — the emergency state is automatically exited upon reception of 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 the emergency state.

Individual Calls – Receive Only

Individual calls are defined as follows:

- **Telephone Calls** — similar to standard telephone calls, except you use your radio. These calls can be landline caller to radio, radio to landline caller, or landline caller to radio talkgroup.

- **Private-Conversation™ II Calls** (Private Calls) — one-on-one calls involving two specific radios in which the conversation will not be heard by others in the current radio talkgroup.

- **Enhanced Private-Conversation Calls** (Enhanced Private Calls, Trunked Radios Only) — same as Private Conversation II calls except the radio automatically verifies that the target radio is active on the system.

- **Selective Calls** (Conventional Channels Only) — used to selectively call an individual or group of radios. It is intended to provide privacy and to eliminate the annoyance of having to listen to conversations that are of no interest to you.

- **Call-Alert™ Pages** — your radio functions like a pager (beeper); Call Alert pages provide a means for other radio users to signal you that they wish to get in touch with you (even if you are away from your radio or in a noisy environment). Call Alert pages also allow users to verify that a radio is active on the system.

Note	In the following procedures, any reference to Private-Conversation (Private Call) will represent both Private-Conversation II calls and Enhanced Private-Conversation calls, unless otherwise specified.

Answering an Individual Call

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

  • a telephone-type ringing if it is a telephone call in a trunked radio;
  • two alert tones if it is a Private-Conversation call or selective call;
  • a continuous cycle of four tones if it is a Call-Alert page; and
  • the LED blinks green.

2a. *Telephone Calls Only* — Press the **Call Response Button**.
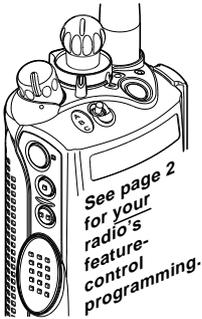
OR

2b. *Private-Conversation Calls and Call-Alert Pages with Private-Conversation* — Within 20 seconds, press the **Call Response Button**.

2c. *Call-Alert Pages Only* — To respond, press the **PTT Switch**. Your conversation will be heard by the entire talkgroup.

See page 2 for your radio's feature-control programming.

OR

See page 2 for your radio's feature-control programming.
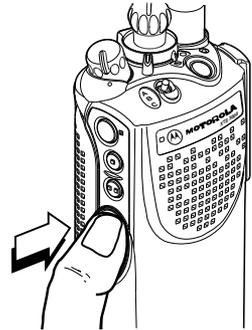
Press the **PTT Switch** to talk privately. *Selective Call* —After 2 seconds, the speaker will unmute.

3.   Converse in the normal manner.

Press the **PTT Switch** to talk; release the **PTT Switch** to listen.

Transmit= Press & Hold PTT Switch
Receive= Release PTT Switch
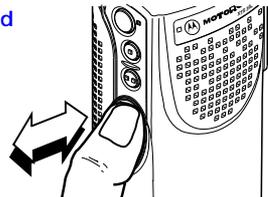
4.   When you have finished your conversation, "hang up" (disconnect) by pressing the **Call Response Button**.

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 2) 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.

See page 2 for your radio's feature-control programming.

Repeater Access

Repeater access allows you, the user, to selectively activate repeaters, which is especially useful in areas where repeaters are placed close together to ensure total coverage. Repeater access can operate automatically or manually and can be enabled through radio service software on a per channel basis. During automatic repeater access, a sidetone is generated to indicate that the repeater access code is being transmitted to discourage you from talking over the data transmission.

In radios programmed with manual repeater access, you activate the repeater access code transmission by pressing the **Repeater Access Button** (if programmed, see page 2); a sidetone is generated if programmed in the radio service software. On radios with MDC-1200™ signalling, when the repeater access is acknowledged, the radio will emit an acknowledge alert tone. This acknowledge alert tone can be disabled through radio service software.

See page 2 for your radio's feature-control programming.

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

Place the **Repeater/Direct Switch** (if programmed, see page 2) in the "repeater" position or the "direct" position.

See page 2 for your radio's feature-control programming.
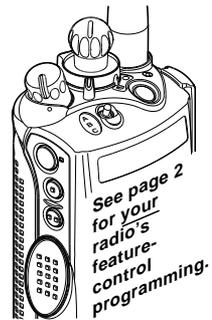
Scan

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 with the radio service software.

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).

> **Note**   This feature will work only on those systems that support it.

•   **Conventional** — Comprises only conventional channels (15 different channels maximum).

•   **Talkgroup Scan** — Comprises conventional and trunked channels from more than one trunking system (15 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.

•   **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.

•   **Automatic Scanning (Autoscan)** — With this feature, the radio begins scanning whenever you select a channel to which a scan list is assigned (strapped). The radio will continue auto scanning until you select a channel that does not have autoscan enabled.

•   **Operator-Selectable Scan** — Scan can be programmed to be selected by a **Scan On/Off Switch** (see page 2).

Turning Scan On and Off

Place the **Scan On/Off Switch** (if programmed, see page 2) in the "scan on" position or the "scan off" position.

See page 2 for your radio's feature-control programming.
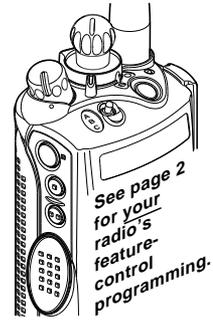
Deleting Nuisance Channels

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.

1. When the radio is locked onto the channel to be deleted, press the **Nuisance-Delete Button** (if programmed, see page 2). Repeat this step to delete additional nuisance channels.

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

2. 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.

See page 2 for your radio's feature-control programming.
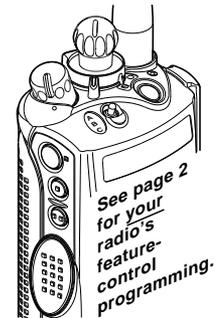
Dynamic Priority Change (Conventional Operation Only)

While the radio is scanning, the dynamic priority change feature lets you 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.

1. When the radio is locked onto the channel to be designated as priority-two, press the **Dynamic Priority Button** (if programmed, see page 2).

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

2. 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.

23

Selecting Squelch Operation

Tone Private-Line® (PL), Digital Private-Line™ (DPL), network ID, and carrier squelch operations are all available in the same radio on a per channel basis.

| 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 to only those messages intended for you. PL, DPL, network ID, and carrier squelch can be programmed on a per channel basis.

Smart PTT

Smart PTT is a per-channel, programmable feature used in conventional radio systems to keep radio users from talking over other radio conversations. When smart PTT is enabled in your radio, you will not be able to transmit on an active channel. If you try to transmit (press the **PTT Switch**) 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** — With this feature enabled, you will be prevented from transmitting if any activity is detected on the channel.

- **Transmit Inhibit on Busy Channel with Wrong Squelch Code** — With this feature 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 Switch** presses within the time programmed through the radio service software for **Smart PTT Quick-Key Timer** (default value is 1/2 second).

4

Special Radio Features

Dynamic Regrouping

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 means of the radio service software, 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 radio controls without being dynamically regrouped, an invalid tone will be heard. |

1. When your radio has been dynamically regrouped, you will hear a "gurgle" tone (unless you are already on the dynamic-regrouping zone/channel), and your radio will be automatically switched to the dynamic-regrouping channel.

| Note | If you are using a radio control knob or switch to select the zone or channel — Until you select the correct dynamic-regrouping position, you will not be able to select scan, telephone call, or Private Conversation call feature, and you will hear a gurgle tone each time you press the **PTT Switch**. 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. |

| Exception to this Note | If your radio is programmed as a select-enabled radio — Once you select the correct dynamic-regrouping position, you can change the radio's zone or channel knob/switch position, press the **PTT Switch**, which will transmit on the dynamic-regrouping zone/channel, and you will not hear the "gurgle" tone. |

2. Talk and listen as usual.

3. When the dynamic regrouping is cancelled by the dispatcher, the radio will automatically return to the present knob/switch zone and/or channel position.

Reprogram Request

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

1. Press the **Reprogram Request Button** (if programmed, see page 2).

2. The reprogram request is automatically sent to the dispatcher.

See page 2 for your radio's feature-control programming.
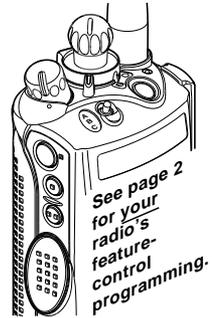
3a. If you hear one beep, press the **PTT Switch** to resend the reprogram request again.

| Note | If the dispatcher fails to acknowledge the reprogram request within six seconds, a low-pitched alert tone sounds. Try again.

OR

3b. If you hear five beeps, the reprogram request was acknowledged by the dispatcher.

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.

• 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, telephone call, or Private Conversation call feature cannot be selected while your radio is select disabled.

PTT-ID Transmit

The PTT-ID transmit feature is a per channel feature where your radio's ID number is automatically sent every time the **PTT Switch** is pressed. 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 during the voice message.

If your radio has MDC-1200™ signalling and the ID is sent before the voice transmission, you will hear a tone until the ID transmission is completed; this helps you avoid talking while the ID code is being transmitted.

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

The **Secure/Clear Switch** (if programmed, see page 2) will set the transmit operation of the radio before the **PTT Switch** is pressed; the transmit operation cannot be changed while the **PTT Switch** is pressed.

See page 2 for your radio's feature-control programming.
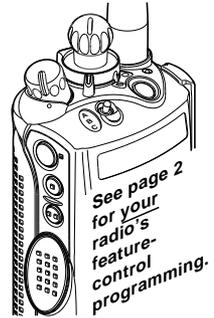
If a channel is programmed for secure-only operation, and the **Secure/Clear Switch** is in the clear (○) position, when the **PTT Switch** is pressed, an invalid-mode tone will sound, and the radio will not transmit until the **Secure/Clear Switch** is set to the secure (⬭) position.

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

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Managing Encryption

KEY Loading

1. Refer to the key-variable loader (KVL) manual for equipment connections and setup.

2. When the KVL is attached to your radio, all other radio functions will be locked out.

3. Pressing the KVL's PTT switch will load the encryption keys into your radio. When the key has been loaded successfully, the radio will sound a short tone for single-key radios; for multikey radios, an alternating tone will be heard.

KEY Erasure (All KEYS Erased)

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.

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 DVP-XL).

*   **Multikey** — The encryption keys can be tied (strapped) on a one-per-channel basis through radio service software.

*   **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, emergency talkgroup, or emergency-announcement group).

Selectable Power-Level

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

| Note | The radio will always turn on to the default setting as determined through radio service software. |

Place the **TX Power-Level Switch** (if programmed, see page 2) in the "high-power" position or the "low-power" position.

High Power = longer transmitting distance; lessens battery life

Low Power = shorter transmitting distance; conserves battery life

See page 2 for your radio's feature-control programming.
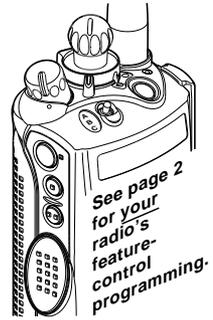
Trunking System Controls

Busy Override

When a talkgroup call is placed in a SmartZone™ system and the system is not able to obtain voice channels at all necessary sites, a busy tone will be generated. If so programmed in the zone manager and through the radio service software, you may override this busy by performing the following steps:

1. Press the **PTT Switch**; a busy indication is received.

2. Release the **PTT Switch**.

3. Press and hold the **PTT Switch** a second time. The busy tones are heard again. After a few seconds, a busy-override chirp will be generated (if so programmed), and the radio will send in a busy-override request.

4. The talkgroup call will be placed at all sites that have voice channel resources available. Other sites will be added to the call as channels become available. Note: Realize that not all members of the talkgroup will be able to hear a call when a busy override is requested.

Dispatcher-Interrupt

The dispatcher-interrupt feature allows the dispatcher to interrupt your radio and place you in a Private Conversation call with the dispatcher.

1. When your radio receives a dispatcher-interrupt call, you will hear a repeating sequence of four, short, medium-pitched tones until you answer the call. The green LED will also flash to announce that a call is being received.

2. Press the **PTT Switch** and converse in the normal manner with the dispatcher.

3. When you are finished with your conversation, hang up by pressing the **Call Response Button**.

Failsoft

If a trunking system experiences a complete failure, the radio will revert to 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 leave the 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 radio will 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) 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 is particularly useful when operating at the fringe of a system's coverage.

Press the **Site Lock/Unlock Button** (if programmed, see page 2). The site-lock state will change.

See page 2 for your radio's feature-control programming.
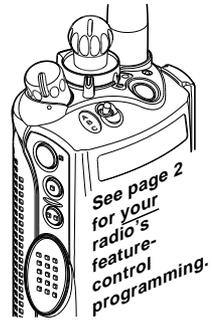
Site Change

1. Press and hold down the **Site Search Button** (if programmed, see page 2) to manually force the radio to change to a new site.

2. You will hear a tone while the radio scans for a new site. When a new site is found, the tone will stop.

See page 2 for your radio's feature-control programming.
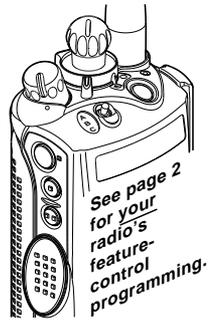
5
Additional Information

Glossary

ACK	Acknowledgment of communication
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)
Dispatcher	An individual who has radio system management duties
FCC	Federal Communications Commission
Hang Up	Disconnect
Landline Caller	Someone communicating through the public telephone system
Page	A one-way alert, with audio and/or display messages
PTT	Push-To-Talk - the PTT switch engages the transmitter and puts 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 re-transmits received signals in order to improve communications range and coverage
RF	Radio Frequency
Squelch	The muting of audio circuits when received signal levels fall below a pre-determined 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

Alert Tones

Sound	Tone Name	Occurs:
Short, Low-Pitched Tone	Radio Self-Test Fail	when the radio fails its power-up self test
	No ACK Received	when the radio fails to receive an acknowledgment 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 switch is pressed and transmissions are not allowed
	Out-of-Range	when the PTT switch is pressed and the radio is out of range of the system
	Invalid Mode	when the radio is on an unprogrammed channel
	Individual Call Warning Tone	when the radio is in an individual call for greater than 6 seconds without any activity
A Group of Low-Pitched Tones (Busy Tone)	Busy	when interconnect channel, phone line, or system is busy
Short, Medium-Pitched Tone	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 reception of activity on a priority channel
	Emergency Alarm Entry	upon entering the emergency state
	Central Echo	when the central controller has received a request from a radio
Continuous, Medium-Pitched Tone	Volume Set	when volume changed on a quiet channel
	Emergency Exit	upon exiting the emergency state
	PTT Sidetone	when data is sent by pressing the PTT switch, but the user must wait to talk
A Group of Medium-Pitched Tones	Failsoft	when system fails
	Automatic Call Back	when voice channel is available from previous request
	Talk Permit	upon pressing the PTT switch; 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

Alert Tones (cont.)

Sound	Tone Name	Occurs:
Short, High-Pitched Tone (Chirp)	Low-Battery Chirp	when battery is below preset threshold value
	Phone Dekey Chirp	from radio to phone line upon releasing the PTT switch
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
Gurgle	Dynamic Regrouping/Over-The-Air Programming	when a dynamic ID has been received and the PTT switch is pressed and the reprogrammed group has not been selected and when the radio is successfully re-KEYed

Battery Charging and Disposal

• Charging Batteries

This product is powered by a nickel-cadmium (Ni-Cd) or nickel-metal-hydride (NiMH) 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 that is attached to the radio, turn the radio off to ensure a full charge. |

⚠ WARNING

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

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

⚠ 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.

• Recycling or Disposal of Batteries

At the end of its useful life, the NiCd battery can be recycled. However, recycling facilities may not be available in all areas. Under various state or local laws, the battery must be recycled or disposed of properly and cannot be disposed of in landfills or incinerators.

For disposal, NiCd batteries should be delivered to an authorized metals reclamation dealer. NiMH batteries, although they contain no designated toxic metals, are recommended to be disposed of through an authorized metals-reclamation dealer.

In addition, U.S. Environmental Protection Agency (EPA) regulations classify used Ni-Cd batteries as hazardous waste, unless certain exemptions apply.

Motorola fully endorses and encourages the recycling of Ni-Cd batteries. If you are located in the United States or Canada, you can ship, post paid, your used Ni-Cd batteries to INMETCO, an EPA approved recycling facility, at the address listed below. If you are not located in the United States or Canada, you may ship your used Motorola Ni-Cd batteries to one of the nearest international locations listed below. Should you have any questions, contact the facility first.

Consideration should be given to the methods of collecting, labeling, and shipping used Ni-Cd batteries. Your federal, state or local EPA should be consulted for specific legal requirements and for recycling options in your area.

Motorola, as a responsible corporate citizen, has always been concerned with the protection of the environment. Please feel free to call the Motorola America's Parts Division, Customer Service Department, toll free, at 1-800-422-4210.

INMETCO, Bin #M1
P.O. Box 720
245 Portersville Road
Ellwood City, PA 16117
Phone: (412) 758-2800
Fax: (412) 758-9311

HANIL METAL RECYCLE CO., LTD
24-4, Palryong-dong,
Changwon-Shi
Kyongsangnam-Do, Korea
Phone: 082 551 93 1911
Fax. 082 551 96 0050

S.N.A.M.
Rue De La Gareene
Z.I. Chesnes-Tharabie
B.P. 733-38297 St. Quentin Fallavier Cedex France
Phone: 033 74 94 59 85
Fax. 033 74 94 13 18

NIPPON RECYCLE CTR. CORP.
6-13-19, Nishitama, Kita-KuZ.I.
Osaka, 530, Japan
Phone: 081 6 311 9071
Fax. 081 6 311 0949

For additional information on batteries, write to: Motorola • Energy Products Division • Customer Care Department • 1700 Belle Meade Court • Lawrenceville, GA 30243-5854.

Helpful Tips

• 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 **Light Button** (see page 2). This light will remain on for a preprogrammed time before it turns off automatically, or you can turn it off immediately by pressing the **Light Button** again. If, while the light is on, any key or button is pressed (except for the **Volume Knob** and the **PTT Switch**), any knob is turned, or any toggle switch is moved, the light will remain on for an additional time period.

• Your radio's squelch level can be reprogrammed at an authorized service facility.

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

  1. 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.

  2. Operating Instructions

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

  3. Problem Not Solved

     If, after following steps 1 and 2, your radio still has a problem, review your service agreement and call the applicable Motorola service representative. 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

• 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 submerse 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.

• 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.

Air Bag Safety Information

> **⚠ WARNING**
>
> An air bag inflates with great force. DO NOT place objects, including communications equipment, in the area over the air bag or in the air bag deployment area If the communication equipment is improperly installed and the air bag inflates, this could cause serious injury.

• Installation of vehicle communication equipment should be performed by a professional installer/technician qualified in the requirements for such installations. An air bag's size, shape, and deployment area can vary by vehicle make, model, and front compartment configuration (for example, bench seat vs. bucket seats).

• Contact the vehicle manufacturer's corporate headquarters, if necessary, for specific air bag information for the vehicle make, model, and front compartment configuration involved in your communication equipment installation

Service

Proper repair and maintenance procedures will assure efficient operation and long life for this product. A Motorola maintenance agreement will provide expert service to keep this and all other communication equipment in perfect operating condition. A nationwide service organization is provided by Motorola to support maintenance services. Through its maintenance and installation program, Motorola makes available the finest service to those desiring reliable, continuous communications on a contract basis. For a contract service agreement, please contact your nearest Motorola service or sales representative, or an authorized Motorola dealer.

Express Service Plus (ESP) is an optional extended service coverage plan, which provides for the repair of this product for a period of three years from the date of shipment from the factory, or the date of delivery if purchased from an authorized Motorola two-way radio dealer. For more information about ESP, contact the Motorola Radio Support Center at 3761 South Central Avenue, Rockford, IL 61102 (800) 227-6772 / (815) 874-1400.

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ASTRO Digital XTS 3000™ Basic Model Portable Radio

Quick-Reference Card

Concentric Switch
– – – – – – –

16-Position Select Knob

On/Off/ Volume Knob

Top Button
– – – – – – –

Top Side Button
– – – – – – –

3-Position Switch
– – – – – – –

Side Button 1
– – – – – – –

Side Button 2
– – – – – – –

PTT Switch

Speaker/ Microphone
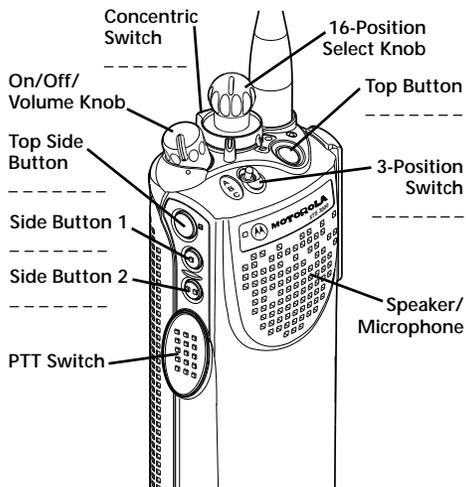
Write in <u>your</u> radio's programmed features.

GENERAL

Turning the Radio On: Rotating 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 Switch**.

Receiving: Release the **PTT Switch**.

Selecting a Zone and Channel:

1. Place the **Zone Switch** (if programmed) to the desired position.

If you would like a different channel than the presently selected channel:

2. Rotate the **16-Position Select Knob** to the desired channel.

3. To transmit on the selected zone/channel combination, press the **PTT Switch**.

COMMON RADIO FEATURE

Answering an Individual Call:

1a. *For telephone calls —* press the **Call Response Button**.

- – - OR - – -

1b. *For Private-Conversation Calls and Call-Alert Pages with Private-Conversation —* within 20 seconds, press the **Call Response Button**. Press the **PTT Switch** to talk privately. For Selective Call after 2 seconds, the speaker will unmute.

- – – OR - – -

1c. *For Call-Alert Pages Only —* To respond, press the **PTT Switch**. Your conversation will be heard by the entire talkgroup.

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

3. When you have finished your conversation, "hang up" (disconnect) by pressing the **Call Response Button**.

COMMON and SPECIAL RADIO FEATURES

Most of your radio features can be accessed by performing the following step. For more detail, refer to the feature description in your manual.

Press (or rotate) the **Feature Button/Switch** (if programmed).

LED DESCRIPTION

Indicates the radio's operating status:

- **Red** = Transmitting

- **Blinking Red** = Channel Busy or Low Battery

- **Blinking Green** = Receipt of Individual Call

Concentric Switch

16-Position Select Knob

On/Off/ Volume Knob

Top Button

Top Side Button

3-Position Switch

Side Button 1

Side Button 2

Speaker/ Microphone

PTT Switch

FOLD

Write in your radio's programmed features (consult your service technician).

FOLD

QUESTIONNAIRE

We believe that reports from users provide valuable information for producing quality operating instructions. Your comments and answers to the following questions will aid us in preparing manuals that contain accurate and complete information of maximum benefit to you.
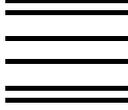
In reference to Manual No. **68P81083C70-O**

ASTRO Digital XTS 3000™

1. Please check all the appropriate boxes:

		Clear	Confusing	Too Detailed	Too Brief	Adequate	Complete	Incomplete	Incorrect	Not Covered in This Manual
Controls and Features	text									
	illustrations									
Operating Procedures	text									
	illustrations									
Alert Tone Explanations										
Battery Information										
Options										
Model Information										
Accessories										
General Care Information										
Other (specify)										

2. For illustrating procedures, do you prefer:

    ☐ photographs   ☐ line drawings   ☐ no preference

3. How would you rate the overall organization of this manual?

    ☐ excellent   ☐ very good   ☐ good   ☐ fair   ☐ poor

4a. If this manual has a "quick reference card," do you use it?

    ☐ yes   ☐ no

4b. If yes, how useful is it to you?

    ☐ extremely ☐ very   ☐ somewhat   ☐ not very

5. How do you rate this manual overall?

    ☐ excellent   ☐ very good   ☐ good   ☐ fair   ☐ poor

6. Comments/Recommendations for improving operating instructions.

    _____

    _____

    _____
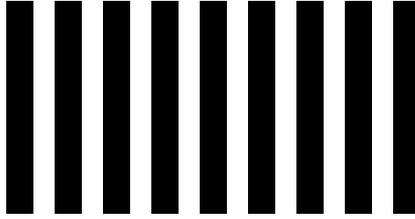
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(A) MOTOROLA

Attention: Technical Publications
Room 2352
8000 W. SUNRISE BOULEVARD
FT. LAUDERDALE, FLORIDA 33322

FCC Safety Standards

In 1991 the Institute of Electrical and Electronics Engineers (IEEE), and in 1992 the American National Standards Institute (ANSI), updated the 1982 ANSI Standard for safety levels with respect to human exposure to RF energy. Over 120 scientists, engineers, and physicians from universities, government health agencies, and industry, after reviewing the available body of research, developed this updated Standard. In March, 1993, the Federal Communications Commission (FCC) proposed the adoption of this updated Standard.

Motorola subscribes to the same safety standard for the use of its products. Proper operation of this radio will result in user exposure substantially below FCC recommended limits:

- Do not hold the radio with the antenna very close to, or touching, exposed parts of the body, especially the face, ears, or eyes, while transmitting. Hold the radio in a vertical position with the microphone two to three inches away from the lips.
- Do not hold the transmit switch (PTT) on when not actually desiring to transmit.
- Do not allow children to play with any radio equipment containing a transmitter.
- Do not operate radio transmitters near explosive blasting caps.The transmitted radio energy may trigger a blasting cap and cause an explosion.
- Do not operate radio transmitters in an explosive atmosphere unless it is a type especially qualified for such use. An explosion may result.
- Do not replace or charge batteries in a hazardous atmosphere. Contact sparking may occur while installing or removing batteries and cause an explosion.
- Turn radio off when removing or installing a battery.
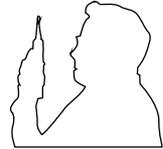
Anyone intending to use a radio in a hazardous area is advised to become familiar with the subject of intrinsic safety and with Section 70 of the National Fire Code, which is commonly referred to as Article 500 of the National Electric Code. Use of anything but factory supplied components may affect the approval and safety of the radio. Likewise, it is advised that servicing should be performed only by qualified personnel who adhere to the following Factory Mutual (FM) required warning:

> **⚠ WARNING**
>
> Modification of FM approved intrinsically safe radios will negate Factory Mutual Research Corporation (FMRC) approval.

Because this radio contains a transmitter, federal law prohibits unauthorized, non-licensed personnel from adjusting or maintaining it. If any operational difficulties should arise while using this product, report them to authorized service personnel as soon as possible.

> **⚠ WARNING**
>
> Do not attempt any unauthorized modification to the radio.

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