



**MOTOROLA**

APX 7500 O5 Control Head  
Mobile Radio User Guide



## Declaration of Conformity

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

### DECLARATION OF CONFORMITY

Per FCC CFR 47 Part 2 Section 2.1077(a)



Responsible Party  
Name: Motorola, Inc.

Address: Motorola, Inc. 1301 E. Algonquin Rd. Schaumburg, IL60196-1078, U.S.A.  
Phone Number: 1-800-927-2744

Hereby declares that the product:

Model Name: **APX 7500**

conforms to the following regulations:

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

#### **Class B Digital Device**

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

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

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

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

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

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## Important Safety Information

### 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 6881095C99) to ensure compliance with RF energy exposure limits.

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

<http://www.motorola.com/governmentandenterprise>

## Software Version

All the features described in the following sections are supported by the radio's software version **R02.00.00** or later.

**Accessing Radio Information** on page 87 to determine your radio's software version.

Check with your dealer or system administrator for more details of all the features supported.

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## Getting Started

Take a moment to review the following:

How to Use This User Guide . . . . .	page 1
Notations Used in This Manual . . . . .	page 1
What Your Dealer/System Administrator Can Tell You . . . . .	page 2

## How to Use This User Guide

This User Guide covers the basic operation of the APX™ 7500 Mobiles.

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

## Notations Used in This Manual

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



**WARNING**

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





**Caution**

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

**Note:**

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

The following special notations identify certain items:

Example	Description
<b>Home</b> button or 	Buttons and keys are shown in bold print or as an icon.
<b>PHONE</b>	Menu entries are shown similar to the way they appear on the radio's display.
	This means "Press the right side of the 4-way Navigation button."

## ■ What Your Dealer/System Administrator Can Tell You

---

You can consult your dealer or system administrator about the following:

- Is your radio preprogrammed with any preset conventional channels?
- Which buttons have been programmed to access other features?
- What optional accessories may suit your needs?

## Preparing Your Radio for Use

Turning On the Radio . . . . . page 3  
 Adjusting the Volume. . . . . page 3

### ■ Turning On the Radio

Press the **Power On/Off** Button briefly.

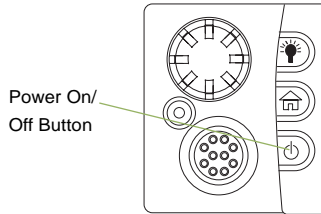
You see red, yellow and green LED's light up. The display then shows Zone and channel text, and menu items display on the screen.

The backlight will turn on to the last selected dim level.

**Note:** Pressing the **Power** Button before the LED lights up will be ignored.

**Note:** If **FAIL ###/##** appears in the display, the radio will not function until the condition has been corrected.

**Note:** If **ERROR ###/##** appears, some non-critical data has been changed. If either of these displays appear, if the display goes blank, or if the unit appears to be locked up, refer to the "Troubleshooting" section.



A **CH MISMATCH** error upon turning on your radio, means that either the Control Head has been connected to an incompatible transceiver, or vice versa.

The radio then performs a self check.

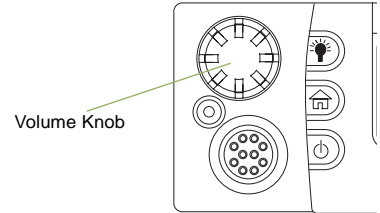
If your radio does not power up, contact your dealer.

*To turn off the radio, press and hold the **Power On/Off Button** after the LEDs light up.*

### ■ Adjusting the Volume

To increase the volume, rotate the Volume knob clockwise to increase the volume.

To decrease the volume, rotate the Volume knob counterclockwise.



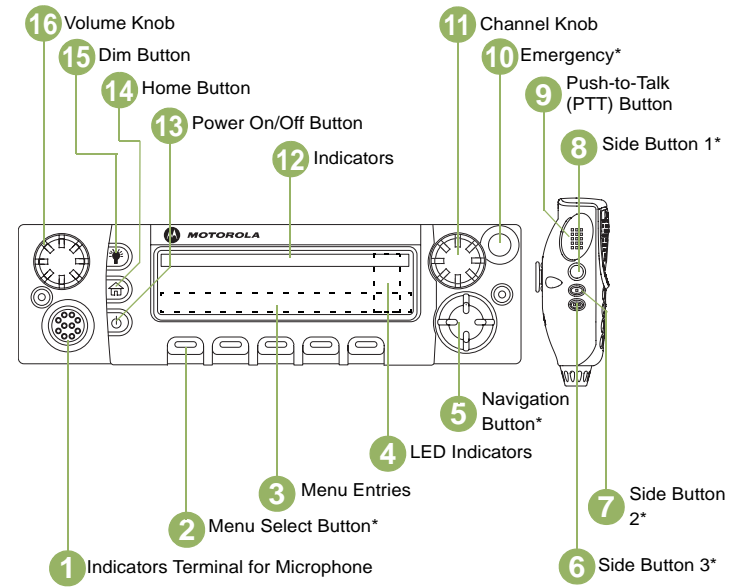
## Identifying Radio Controls

Take a moment to review the following:

- Radio Parts and Controls . . . . . page 4
- Programmable Features . . . . . page 5
- Accessing the Preprogrammed Functions . . . . . page 7
- Using the Keypad . . . . . page 10
- Push-To-Talk (PTT) Button . . . . . page 14

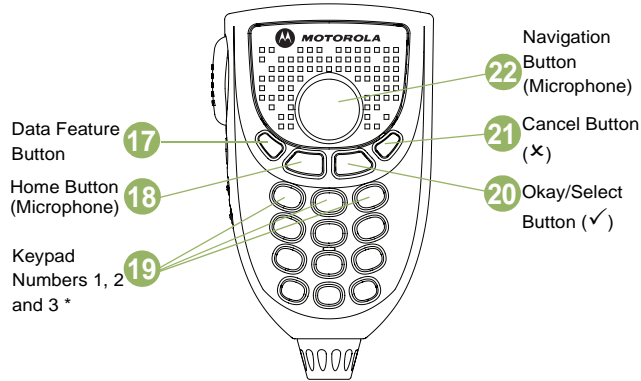
## Radio Parts and Controls

### 05 Control Head



\*These radio controls/buttons are programmable.





\*These radio controls/buttons are programmable.

## ■ Programmable Features

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

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

- Press – Pressing and releasing rapidly.

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

### 📁 Assignable Radio Functions

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

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

**Channel** – Selects a channel.

**Contacts** – Selects the Contacts menu.

**Dynamic Priority (Trunking Only)** – Allows any channel in a scan list (except for the Priority-One channel) to temporarily replace the Priority-Two channel.

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

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

**IP** – Displays the IP (Internet Protocol) information of the radio.

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

**Nuisance Delete** – Temporarily removes an unwanted channel, except for priority channels or the designated transmit channel, from the scan list. The designated transmit channel refers to the user’s selected zone/channel combination from which scan is initiated.

**Phone** – Allows you to make and receive calls similar to standard phone calls.

**PL Defeat** – Overrides any coded squelch (DPL or PL) that is preprogrammed to a channel.

**Private Call** – Allows a call from an individual radio to another individual radio.

**Profiles** – Allows for easy access to a set of preprogrammed visual and audio settings of the radio.

**Recent Calls** – Allows for easy access to the list of calls recently received or made.

**Rekey Request** – Notifies the dispatcher that you want a new encryption keys.

**Reprogram Request (Trunking Only)** – Notifies the dispatcher that you want a new dynamic regrouping assignment.

**Scan List Programming** – Selects the scan list for editing.

**Scan** – Toggles scan on or off.

**Secure/Clear** – Toggles secure transmission on or off.

**Select** – Selects the assigned list for editing.

**Selective Call (Digital Modes Only)** – Calls an assigned radio.

**Site Lock/Unlock** – Locks onto a specific site.

**Site Search** – Performs site search for AMSS (Automatic Multiple Site Select) or SmartZone operation.

**Status (Astro 25 Trunking Only)** – Sends data calls to the dispatcher about a predefined status.

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

**Talkgroup** – Allows a call from an individual radio to a group of radios.

**Ext PA On/Off** – Toggles the audio routing between the connected public address (PA) loudspeaker amplifier and the radio's internal public address (PA) system.

**PA On/Off** – Toggles the radio's internal public address (PA) system on or off.

**TMS** – Selects the text messaging menu.

**TMS Quick Text** – Selects a predefined message.

**User Login** – Automatically registers with the server.

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

### Assignable Settings or Utility Functions

**All Tones/Alerts** – Toggles all tones on or off.

**Backlight** – Toggles display backlight on or off.

**Horns/Lights** – Toggles horns and lights feature on or off.

**Keypad Mute** – Toggles the keypad tones on or off.

**Dim** – Changes the display brightness.

**Speaker** – Activates external speaker to share your call with your group.

**Squelch** – Toggles squelch level between normal and tight.

**TX Power Level** – Toggles transmit power level between high and low.

**Voice Mute** – Toggles voice mute on or off.

**Volume Set** – Adjusts the volume of the speakers.

## ■ Accessing the Preprogrammed Functions

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

- A short or long press of the relevant programmable buttons.

OR


Use the **Menu Select Button** (  ).

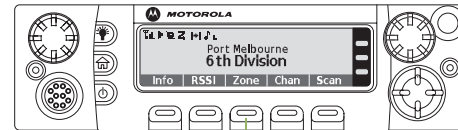
## Using the Menu Select Buttons

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

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

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

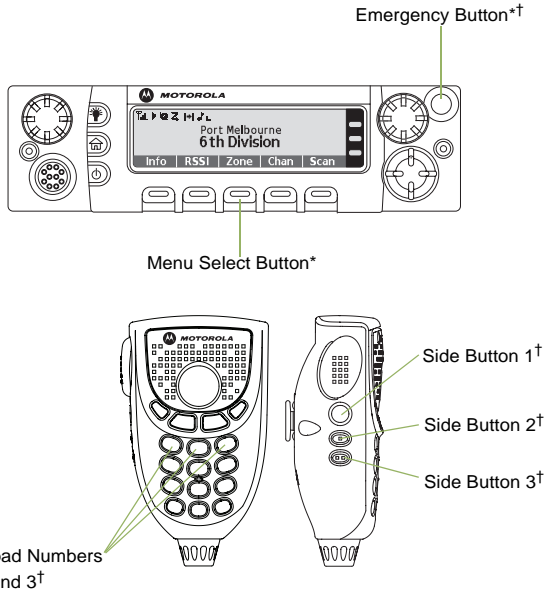
Press the **Menu Select** button (  ) directly below **CHAN**.



Menu Select Button

## Using the Advance Programmable Buttons

There are two special features which are designed to help you to shorten the process on certain common features



\* These programmable buttons support the **One Touch Button** feature.


† These programmable buttons support the **Mode Select Button** feature.


**(Quick Access) One Touch Button** – Enters a menu with a short press on the preprogrammed One Touch button. Call, Page, Phone, Status and Message can be assigned to these buttons.


**Mode Select Button** – Programs the current zone and channel to a Mode Select button with a long press on the Mode Select button. After the buttons are programmed, you can return to the preprogrammed zone and channel with a short press on the programmed Mode Select button.


## Using the Navigation Buttons

### Home Button

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

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

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

The  button also can revert to home channel. Check with your dealer or system administrator for more information.

 **Data Feature Button**

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

 **4-Way Navigation Button**

Use this button to scroll through the radio's lists or items in the display, or both.

 **Volume Knob**

Use this Volume Knob to adjust the volume of the speakers by turning it clockwise or counterclockwise.

 **Channel Knob**

Use this Channel Knob to scroll the channels by turning it clockwise or counterclockwise.

## ■ Using the Keypad

You can use the 3 x 4 alphanumeric keypad on the keypad microphone (Motorola part number: HMN4079\_) to access your radio's features. The keypad functions in a manner similar to a standard telephone keypad when entering numeric digits. When the keypad is used to edit a list, each key can generate different characters of the alphabet. The tables below show the number of times a key needs to be pressed to generate the required character.

### 📄 Keypad Characters – Uppercase Mode

Key	Number of Times Key is Pressed																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	1	.	,	?	!	;	@	_	-	*	#	&	\$	/	+	\	"	'	(	)	
2 abc	A	B	C																		
3 def	D	E	F																		
4 ghi	G	H	I																		
5 jkl	J	K	L																		
6 mno	M	N	O																		
7 pqrs	P	Q	R	S																	
8 tuv	T	U	V	8																	
9 wx yz	W	X	Y	Z																	
0	Toggle between mixed case mode, uppercase mode, and lowercase mode.																				
*	Space																				
#	Toggle between numeric and letter mode.																				

 **Keypad Characters – Lowercase Mode**

Key	Number of Times Key is Pressed																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
<b>1</b>	1	.	,	?	!	;	@	_	-	*	#	&	\$	/	+	=	\	“	’	(	)
<b>2 abc</b>	a	b	c																		
<b>3 def</b>	d	e	f																		
<b>4 ghi</b>	g	h	i																		
<b>5 jkl</b>	j	k	l																		
<b>6 mno</b>	m	n	o																		
<b>7 pqrs</b>	p	q	r	s																	
<b>8 tuv</b>	t	u	v																		
<b>9 wx yz</b>	w	x	y	z																	
<b>0</b>	Toggle between mixed case mode, uppercase mode, and lowercase mode.																				
<b>*</b>	Space																				
<b>#</b>	Toggle between numeric and letter mode.																				

## Keypad Characters – Numeric Mode

Key	Number of Times Key is Pressed																				
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	1	.	,	?	!	;	@	_	-	*	#	&	\$	/	+	=	\	“	‘	(	)
2 abc	2																				
3 def	3																				
4 ghi	4																				
5 jkl	5																				
6 mno	6																				
7 pqrs	7																				
8 tuv	8																				
9 wx yz	9																				
0	0																				
*	Space																				
#	Toggle between numeric and letter mode.																				



## Keypad Characters – Hexadecimal Mode

Key	Number of Times Key is Pressed																					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1	1																					
2 abc	2	A	B	C																		
3 def	3	D	E	F																		
4 ghi	4																					
5 jkl	5																					
6 mno	6																					
7 pqrs	7																					
8 tuv	8																					
9 wx yz	9																					
0	0																					
*	Not applicable																					
#	Not applicable																					

## ■ Push-To-Talk (PTT) Button

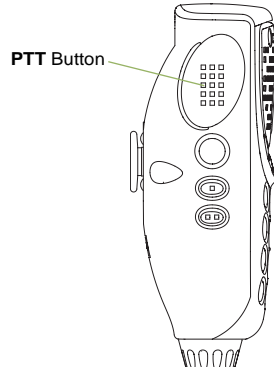
The **PTT** button on the side of the microphone serves two basic purposes:

- While a call is in progress, the **PTT** button allows the radio to transmit to other radios in the call.

Press and hold down **PTT** button to talk. Release the **PTT** button to listen.

The microphone is activated when the **PTT** button is pressed.

- While a call is not in progress, the **PTT** button is used to make a new call. See **Making a Radio Call** on page 29.



## Identifying Status Indicators

Your radio indicates its operational status through the following:

Status Icons . . . . .	page 15
Text Messaging Service (TMS) Icons . . . . .	page 17
LED Indicators . . . . .	page 18
Intelligent Lighting Indicators . . . . .	page 19
Alert Tones . . . . .	page 20

## Status Icons



### Receiving

Radio is receiving a call or data.



### Transmitting

Radio is transmitting a call or data.



### Call Received

Radio has received an Individual Call.



### Received Signal Strength Indicator (RSSI)

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



### Direct

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



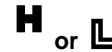
### Monitor (Carrier Squelch)

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



### In-Call User Alert

- **On** = The feature is enabled. Voice muting of the affiliated trunking talkgroup or selected conventional channel is activated.
- **Off** = The feature is disabled. Voice muting of the affiliated trunking talkgroup or selected conventional channel is deactivated.



### Power Level

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



### Scan

Radio is scanning a scan list.



### Priority-One Channel Scan

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



### View/Program Mode

Radio is in the view or program mode.

- **On steady** = View mode
- **Blinking** = Program mode



### Vote Scan Enabled

The vote scan feature is enabled.



### Secure Operation

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



### AES Secure Operation

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



### Location Signal

- **On** = Location feature is enabled, and location signal is available.
- **Off** = Location feature is disabled.
- **Blinking** = Location feature is enabled, but no location signal is available.



### User Login Indicator (IP Packet Data)

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



### Data Activity

Data activity is present.

## ■ Text Messaging Service (TMS) Icons

This feature allows you to send and receive text messages. See **Text Messaging Service (TMS)** on page 57 for more information.

### 📄 Status Icons

The following icons appear on the radio's display for TMS features:



#### **Inbox Full**

The Inbox is full.



#### **Message Sent**

The text message is sent successfully.



#### **Message Unsent**

The text message cannot be sent.



#### **Unread Message**

- User receives a new message.
- The selected text message in the Inbox has not been read.



#### **Read Message**

The selected text message in the Inbox has been read.



#### **Priority Status**



- The "Priority" feature is toggled on before the message is sent.
- Messages in the Inbox folder are flagged with "Priority".



#### **Request Reply**



- The "Request Reply" feature is toggled on before the message is sent.
- Messages in the Inbox folder are flagged with "Request Reply".



#### **Priority Status and Request Reply**

- User is composing a message with a priority status and a request for a reply.
- Messages in the Inbox folder are flagged with "Priority" and "Request Reply".



#### **Numeric**

Indicates that the text entry is currently in numeric mode.

**Mixed Case**

Indicates that the text entry is currently in normal text mode.

**Uppercase**

Indicates that the text entry is currently in uppercase mode.

**Lowercase**

Indicates that the text entry is currently in lowercase mode.

**Hexadecimal**

Indicates that the text entry is currently in hexadecimal mode.

 **TMS Menu Options**

Menu Option	Description/Function
<b>BACK</b>	Brings you back to the previous screen.
<b>DEL</b>	Deletes a message or text.
<b>EDIT</b>	Brings you to the edit screen.
<b>EXIT</b>	Exits to the Home screen.
<b>NO</b>	Returns to the previous screen.
<b>OPTN</b>	Brings you to the Options main screen.
<b>RPLY</b>	Replies to a message.

Menu Option	Description/Function
<b>SEL</b>	Selects the highlighted command.
<b>SEND</b>	Sends the message.
<b>YES</b>	Updates or saves a command.

**LED Indicators**

LED indicators show the operational status of your radio.

**Solid red** – Radio is transmitting.

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

**Solid yellow** – Channel is busy.

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

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

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

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

## ■ Intelligent Lighting Indicators

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

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

Backlight	Event	When
Orange	Emergency Alerts	The radio initiates an emergency alarm or call.
		The radio receives an emergency alarm or call.
Red	Critical Alerts	The radio is out of range.
		The radio enters failsoft mode.
		The radio is unable to establish a full connection with the system.
Green	Call Alerts	The radio receives private call.
		The radio receives phone call.
		The radio receives a call alert.
		The radio receives selective call.

## ■ Alert Tones

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

You Hear	Tone Name	When
Two high-pitched tones	Private Conversation™	When a Private Call is received.
Four high-pitched tones every five seconds	Call Alert	When a Call Alert page is received.
Single, high-pitched tone	Central Acknowledge	When a Call Alert, emergency alarm, reprogram request, or status/message transmission is received by the system's central controller.
Four high-pitched tones	Mobile Unit Acknowledge	When a Call Alert page is received by the intended unit, or the emergency alarm, reprogram request, or status/message transmission is acknowledged by the intended dispatcher.
Sound similar to a telephone busy signal	System Busy	When the <b>PTT</b> button is pressed, indicates transmission fail because all system radio channels are in use. Release the <b>PTT</b> button and wait for call back.
A series of two short, high-pitched tones	Automatic Call Back	When a channel is now available for your previously requested transmission.
A series of two short, high-pitched tones (same as automatic call back)	Talk Permit (Optional)	When the <b>PTT</b> button is pressed, indicates the system is accepting your transmission.
A series of low-pitched tones followed by a series of high-pitched tones	Scan Alert On	When Scan feature is activated through the preprogrammed button.






You Hear	Tone Name	When
<b>A series of high-pitched tones followed by a series of low-pitched tones</b>	Scan Alert Off	When Scan feature is deactivated through the preprogrammed button.
<b>Continuous, low-pitched tone</b>	Talk-Prohibit	(When the <b>PTT</b> button is pressed) the system is out of service.
	Smart PTT Inhibit	(When the <b>PTT</b> button is pressed) the channel is busy with the Smart PTT feature enabled.
	Out-of-Range	(When the <b>PTT</b> button is pressed) indicates the radio is not in the range of the trunked radio system.
	Illegal Mode	When you have entered a mode where normal system traffic will be missed, or you are attempting something which is not permitted. Examples include: forgetting to exit the telephone interconnect mode after a call ends (fleet and subfleet calls cannot be received), attempting to transmit on a receive-only conventional mode, attempting to select a dynamic mode where no dynamic ID assignment has been made.
<b>Single, high-pitched tone every nine seconds</b>	Failsoft	When a trunked system central controller failure in an unmuted receive condition. The radio reverts from trunked operation to a system similar to conventional radio repeater operation. Other system users can be heard sharing the channel.
<b>Brief low-pitched tone</b>	Time-Out Timer Warning	When your present transmission will soon be disabled.
<b>Single, short, high-pitched tone</b>	Valid Key	When you pressed a valid key, or you entered a feature configuration state, or you are receiving or transmitting in the clear mode on secure models (with TX Clear Alert Tones enabled).
<b>Single, low-pitched tone</b>	Invalid Key	When you tried to make an invalid key press, or that an emergency alarm, reprogram request, or status/message was not acknowledged.

You Hear	Tone Name	When
<del>Unique chirping sound</del> Gurgle	Dynamic Reprogramming	When a dynamic ID is assigned.
Unique low-pitched chirp	New Message	When a new message is received.
Unique high-pitched chirp	Priority Message	When a priority message is received.

## ■ Phone Call Display and Alert Prompts

The following appears on the radio's display when you make and receive Phone calls. The radio also uses alert tones to indicate the current status.

You Hear	You See	When	Notes
A Long Tone	NO PHONE	You press the <b>PTT</b> button and the phone system is not available.	Press  to hang up. The radio returns to the Home screen.
	PHONE BUSY	The phone system is busy.	Press  to exit the phone mode and try your call later.
A Busy Tone	PHONE BUSY	When a channel is not available.	The radio automatically connects when a channel opens.
–	NO ACKNOWLEDGE	The call is not acknowledged.	Press  to hang up. The radio returns to the Home screen.
A High-Pitched Tone	–	When you release the <b>PTT</b> button.	The radio indicates to the landline party that he or she may begin talking.

**Note:** You have the option of sending additional digits (overdial), such as an extension number, or credit card or PIN numbers, to the phone system. If the radio is preprogrammed for live overdial, every digit entered after the call is connected is sent to the phone system.

If the radio is preprogrammed for buffered overdial, the digits pressed are entered into memory and then sent when the **PTT** button is pressed. Press the **PTT** button to send either digits or voice, but not both at the same time.

## General Radio Operation

Once you understand how your APX 7500 O5 CH Mobile is configured, you are ready to use your radio.

Use this navigation guide to familiarize yourself with the basic Call features:

Selecting a Zone . . . . .	page 24
Selecting a Radio Channel . . . . .	page 25
Receiving and Responding to a Radio Call. . . . .	page 26
Making a Radio Call . . . . .	page 27
Repeater or Direct Operation . . . . .	page 30
Monitoring Features . . . . .	page 30

- 3 Press the **PTT** button to begin transmitting on the displayed

## Selecting a Zone

A zone is a group of channels.

**Note:** Your radio must be preprogrammed to allow you to use these features.

### Procedure:

#### Using the Menu Entry ZONE:

- 1 **▶** to **ZONE**.
- 2 Press the **Menu Select** button directly below **ZONE**. The display shows the current zone and channel.
- 3 **▶** or **◀** button until the desired zone is displayed.
- 4 Press **⏠** or the **PTT** button to confirm the selected zone number.
- 5 Press the **PTT** button to begin transmitting on the displayed zone channel.

### OR

#### Using the Menu Entry ZNUP or ZNDN

- 1 **▶** to **ZNUP** or **ZNDN**.
- 2 Press the **Menu Select** button directly below **ZNUP** or **ZNDN** until the required zone appears.  
zone channel.

**Note:** Positions of the **ZNUP** or **ZNDN** softkey on the display may differ each time you release the Menu Select button.

## ■ Selecting a Radio Channel

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

Use the following procedure to select a channel.

**Note:** Your radio must be preprogrammed to allow you to use this feature. If you select a channel that is not within the preprogrammed band, the radio indicates that it is on an unsupported frequency with both audio and visual warnings.

Consult a qualified radio technician for the right choice between the following methods.

### Procedure:

Rotate the **Channel** knob until the display shows the desired channel.

### OR

#### Using the Menu Entry **CHAN**:

- 1 Press and hold **▶** and hold to scroll to **CHAN**.

- 2 Press the **Menu Select** button directly below **CHAN**. The display shows the current zone and mode.

- 3 Rotate the **Channel** knob to the desired channel.

- 4 Press **⏠** or the **PTT** button to confirm the channel.

- 5 Press the **PTT** button to transmit on the displayed zone channel.

### OR

#### Using the Menu Entry **CNUP** or **CNDN**

- 1 **▶** to **CNUP** or **CNDN**.

- 2 Press the **Menu Select** button directly below **CNUP** or **CNDN** until the required zone appears.

- 3 Press the **PTT** button to begin transmitting on the displayed zone channel.

**Note:** Positions of the **CNUP** or **CNDN** softkey on the display may differ each time you release the Menu Select button.

*When the channel you want is not shown in the current zone, the radio allows you to press **◀** or **▶** **⊙** the zone containing the channel. Please consult a qualified technician for this option.*

## ■ Receiving and Responding to a Radio Call

### 📄 Receiving and Responding to a Talkgroup Call

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

#### Procedure:

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

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

The LED lights up solid yellow. The display shows the talkgroup alias or ID, and the caller alias or ID.

**OR**

#### **Trunking Only:**

The display shows the caller alias or ID.

- 2 Hold the microphone vertically 1 to 2 inches (2.5 to 5.0 cm) from your mouth.
- 3 Press the **PTT** button to respond to the call. The LED lights up solid red.
- 4 Release the **PTT** button to listen.

See *Making a Talkgroup Call* on page 28.

### 📄 Receiving and Responding to a Private Call (Trunking, Digital Mode Only)

A Private Call is a call from an individual radio to another individual radio.

These one-to-one calls between two radios are not heard by others in the current talkgroup. The calling radio automatically verifies that the receiving radio is active on the system and can display the caller ID.


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

#### Procedure:

When you receive a Private Call:

- 1 You hear two alert tones and the LED blinks green. The display shows **CALL RECEIVED**.
- 2 Press the **Menu Select** button directly below **CALL** within 20 seconds after the call indicators begin.
- 3 During the call, the display shows the caller alias (name), if it is in the call list.  
**OR**  
During the call, the display shows the caller ID (number), if the caller's name is not in the call list.

4 Press and hold the **PTT** button to talk. Release the **PTT** button to listen.

5 Press  to hang up and return to the Home screen.

**Note:** If you press **PTT** button before pressing the **Menu Select** button directly below **CALL**, your conversation will be heard by all members of the talk group.

*If 20 seconds pass before you press the **Menu Select** button directly below the **CALL**, you will not respond privately to the call just received. Instead, you initiate a Private Call. See **Making a Private Call (Trunking, Digital Mode Only)** on page 28.*

## Receiving and Responding to a Telephone Call (Trunking Only)


This feature allows you to receive calls similar to standard phone calls from a landline phone.

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

### Procedure:

- 1 You hear a telephone-type ringing and the LED blinks green. The backlight of the screen turns green. The display shows **PHONE CALL** and the call received icon blinks.
- 2 Press the **Menu Select** button directly below **PHON**.

3 Press and hold the **PTT** button to talk. Release the **PTT** button to listen.

4 Press  or the **Menu Select** button directly below **PHON** button to hang up and return to the **Home** screen.

See **Making a Telephone Call (Trunking Only)** on page 29 for details.

## ■ Making a Radio Call

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



- The preprogrammed Zone switch
- The Channel Knob
- A preprogrammed **One Touch** button
- A preprogrammed **Mode Select** button
- The Contacts list (see **Contacts** on page 40).

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

## Making a Talkgroup Call

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

### Procedure:

- 1  or  to **TGRP**. The display shows the last-selected talkgroup.  
**OR**  
Rotate the **Channel Knob** to select the channel with the desired talkgroup.

---

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

---

- 3 Press the **PTT** button to make the call.

---

- 4 **ASTRO Conventional Only:**  
The LED lights up solid red. The display shows the talkgroup alias or ID.  
**OR**  
**Trunking Only:**  
The LED lights up solid red.

---

- 5 Speak clearly into the microphone.

---

- 6 Release the **PTT** button to listen.

---

See *Using the Talkgroup Call Feature (Conventional Operation Only)* on page 34 for details on setting a Talkgroup

## Making a Private Call (Trunking, Digital Mode Only)



This feature allows you to send an individual Call Alert page if there is no answer from the target radio. Your radio must be preprogrammed to allow you to use this feature.

### Procedure:

Press the preprogrammed **Quick Access (One-Touch) Enhanced Private Call** button to dial the preprogrammed ID and proceed to Step 5.

### OR



Follow the procedure below.

- 1  or  to **CALL**.

---

- 2 Press the **Menu Select** button directly below **CALL**. The LED lights up solid red. The display shows the last transmitted or received ID.

---


- 3 Press the **Menu Select** button directly below **CNTS** to scroll through and select the required ID.  
**OR**  
Press the **Menu Select** button directly below **LIST** to go to the first number of the call list.  
**OR**  
 or  to the required ID.  
**OR**  
Use the keypad to enter the required ID.

---

- 4 Press the **PTT** button to start the Private Call.

---



- 5 A telephone-type ringing sounds if the receiving unit is in service. The display shows **CALLING...<NUMBER>** or **CALLING...<ALIAS>**.
- 
- 6 Hold the microphone vertically 1 to 2 inches (2.5 to 5.0 cm) from your mouth.
- 
- 7 When you are connected, the display shows the ID of the target radio. Press and hold the **PTT** button to talk. Release the **PTT** button to listen.
- OR**  
If no acknowledgment is received, the display shows **NO ACKNOWLEDGE**.
- OR**  
If the target radio does not respond before the time out, the display shows **NO ANSWER**.
- 
- 8 Press  to return to the **Home** screen.
- 

See ***Sending a Call Alert Page*** on page 55 for more information.

### **Making a Telephone Call (Trunking Only)**






This feature allows you to make calls similar to standard phone calls to a mobile or landline phone.

#### **Procedure:**

Press the preprogrammed **Quick Access (One-Touch) Phone Call** button to dial the preprogrammed phone number and proceed to Step 5.

#### **OR**

Follow the procedure below.

- 1  or  to **PHON**.
- 
- 2 Press the **Menu Select** button directly below **PHON**. The display shows the last transmitted phone number.
- 
- 3 Press the **Menu Select** button directly below **CNTS** to scroll through and select the required ID.
- OR**  
Press the **Menu Select** button directly below **LIST** to go to the first number of the call list.
- OR**  
 or  to the required phone number.
- OR**  
Use the keypad to enter the required phone number.
- 
- 4 Press and release the **PTT** button to dial the phone number.
- 
- 5 Hold the microphone vertically 1 to 2 inches (2.5 to 5.0 cm) from your mouth.
- 
- 6 When your call is answered, press the **PTT** button to talk.
- 
- 7 Release the **PTT** button to listen.
- 
- 8 Press  to return to the Home screen.
- 

See ***Alert Tones*** on page 20 for more information if your call is **NOT** answered.

## ■ Repeater or Direct Operation

---

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

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

### Procedure:

Press the preprogrammed **Repeater/Direct** switch to toggle between talkaround and repeater modes.

### OR

Follow the procedure below.

- 1 ◀ or ▶ to **DIR**.
- 2 Press the **Menu Select** button directly below **DIR**.
- 3 The **Dir** indicator lights to show **REPEATER MODE** if the radio is currently in Repeater mode.  
**OR**  
The **Dir** indicator lights to show **DIRECT MODE** and the Talkaround icon if the radio is currently in Direct mode (during conventional operation only).

*You can repeat step 2 to toggle between the two modes. Once in Direct Mode, press **PTT** button to start conversation with the radios nearby.*

## ■ Monitoring Features

---

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

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

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

### Monitoring a Channel

#### Procedure:

Lift the microphone control head off hook.


#### Conventional Modes Only:

- 1 Listen for activity on that channel.
- 2 Adjust the **Volume Knob** if necessary.
- 3 If you hear no activity, press and hold the **PTT** button to start your conversation.

### OR

#### Trunked Modes Only:

- 1 Press the **PTT** button.

- 2 If you hear two, short, high-pitched tones, or if you hear no tone and the  indicator lights steadily, then proceed with your message.
- 3 Release the **PTT** button to receive (listen).

*if you are not in the range of the system, you may hear a continuous low-pitched tone and the display shows "OUT OF RANGE".*

### Conventional Mode Operation



This feature allows you to monitor channel traffic on conventional channels by defeating the coded squelch. Thus you can listen to another user active on the channel. This way, you may be prevented from talking over someone else's conversation.

**Note:** This feature must first be enabled by a qualified radio technician or system administrator.

#### **Procedure:**

Take the control head off hook. (This is the same as monitor on. You hear all channel traffic.)

#### **OR**

- 1 At **Home** mode where the default zone and channel are being displayed,  or  button to **MON**.

- 2 Press the **Menu Select** button directly below **MON** momentarily to activate monitoring. The display shows **MONITOR ON**.
- 3 Press the **Menu Select** button to deactivate the monitoring. The display shows **MONITOR OFF**.

***MONITOR ON** shown on the display indicates that the radio is monitoring. Pressing the **Menu Select** button again turns monitor off and you don't hear all channel traffic.*





## Advanced Features

Use this navigation guide to learn more about advanced features available with your radio:

Advanced Call Features . . . . .	page 32
Multiple Control Head Features . . . . .	page 37
Contacts . . . . .	page 40
Scan Lists . . . . .	page 45
Scan . . . . .	page 47
Call Alert Paging . . . . .	page 50
Automatic Registration Service (ARS) . . . . .	page 54
Text Messaging Service (TMS) . . . . .	page 57
Secure Operation . . . . .	page 68
Global Positioning System (GPS) Enabled. . . . .	page 71
Utilities. . . . .	page 81

## Advanced Call Features

### Calling a Phone Not in the List

- 1  or  to **PHON**.
- 2 Press the **Menu Select** button directly below **PHON**.
- 3 Enter the desired phone number from the optional keypad microphone. The display updates as the numbers are entered.
- 4 Press  button on the keypad microphone to make the call.
- 5 Press and hold the **PTT** button to talk. Release the **PTT** button to listen.
- 6 Press  or **Menu Select** button directly below **PHON** to exit.

## Receiving and Making a Selective Call (ASTRO Conventional Only)

This feature allows you to receive a call from or to call a specific individual. It is intended to provide privacy and to eliminate the annoyance of having to listen to conversations that are of no interest to you.

### Receiving a Selective Call

#### Procedure:

- 1 When you receive a Selective Call, you hear two alert tones and the LED lights up solid yellow. The call received icons blinks and the display alternates between **CALL RECEIVED** and the home display.

---

- 2 Press the **Menu Select** button below **CALL** within 20 seconds after the call indicators begin. The display shows the alias or ID number of the sender.

---

- 3 The speaker unmutes.


---

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

---

- 5 Press and hold the **PTT** button to talk. Release the **PTT** button to listen.

---

- 6 Press  to return to the Home screen.

---

**Note:** If you press **PTT** button before pressing the **Menu Select** button directly below **CALL**, your conversation will be heard by all members of the talk group.

*If 20 seconds pass before you press the **Menu Select** button directly below the **CALL**, you will not respond privately to the call just received. Instead, you initiate a Private Call. See “**Making a Selective Call**” on page 33.*



### Making a Selective Call

#### Procedure:

Press the preprogrammed **Quick Access (One-Touch) Selective Call** button to dial the preprogrammed ID and proceed to Step 4.

#### OR



Follow the procedure below.

- 1  or  to **CALL**.

---


  - 2 Press the **Menu Select** button directly below **CALL**. The display shows the last transmitted or received ID.


---

  - 3 Press the **Menu Select** button directly below **CNTS** to scroll through and select the required ID.
- OR**
- Press the **Menu Select** button directly below **LIST** to go to the last number dialed.
- OR**
-  or  to the required ID.

OR

Use the keypad to enter the required ID.

- 4 Hold the microphone vertically 1 to 2 inches (2.5 to 5.0 cm) from your mouth.
- 5 Press and hold the **PTT** button to start the Selective Call. The display shows the ID of the target radio.
- 6 Release the **PTT** button to listen.
- 7 Press  to return to the Home screen.

*If you do not press  button to hang up, your radio will remain in Selective Call state with the other unit. You will miss all subfleet traffic and incoming phone calls.*








### Using the Talkgroup Call Feature (Conventional Operation Only)

This feature allows you to define a group of conventional system users so that they can share the use of a conventional channel.

**Note:** Encryption keys are slaved to talkgroups. When talkgroups are enabled, encryption keys are changed by changing the active talkgroup. See **Secure Operation** on page 68 for more information.

### Selecting a Talkgroup

**Procedure:**

- 1  or  to **TGRP**.
- 2 Press the **Menu Select** button directly below **TGRP**. The display shows the last talkgroup that was selected and stored.
- 3  or  to **PSET** for the preset preprogrammed talkgroup.  
**OR**  
 or  to the required talkgroup.  
**OR**  
Use the keypad to enter the number of the corresponding talkgroup in the list.
- 4 Press the **Menu Select** button directly below **SEL** to save the currently selected talkgroup and return to the **Home** screen.
- 5 If the encryption key slaved to the new talkgroup is erased, a momentary key fail tone sounds and the display shows **KEY FAIL**.  
**OR**  
If the encryption key that is slaved to the new talkgroup is not allowed, a momentary key fail tone sounds and the display shows **ILLEGAL KEY**.
- 6 Press  or the **PTT** button to exit.

## Sending a Status Call

This feature allows you to send data calls to the dispatcher about a predefined status.

Each status can have up to a 14-character name. A maximum of eight status conditions is possible.



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

### Procedure:

Press the preprogrammed **Status** button and proceed to Step 3.

**OR**

Follow the procedure below.

- 1  or  to **STS**.



---

- 2 Press the **Menu Select** button directly below **STS**.

---

- 3 The display shows the last acknowledged status call, or the first status in the list.

---

- 4  or  to the required status.  
**OR**  
Use the keypad to enter a number corresponding to the location in the status list.

---


- 5 Press the **PTT** button to send the status. The display shows **PLEASE WAIT**.


---

- 6 When the dispatcher acknowledges, four tones sound and the display shows **ACK RECEIVED**. The radio returns to normal dispatch operation.

**OR**

If no acknowledgment is received, a low-pitched tone sounds and the display shows **NO ACKNOWLEDGE**.

- 7 Press  to return to the Home screen.

*No traffic is heard on trunked channels while Status Calls is selected. If the radio detects no Status Call activity for six seconds, an alert tone sounds until you press  or the **PTT** button.*

## Using the Dynamic Regrouping Feature (Trunking, Digital Mode Only)

This feature allows the dispatcher to temporarily reassign selected radios to a single special channel so they can communicate with each other. This feature is typically used during special operations and is enabled by a qualified radio technician.

You will not notice whether your radio has this feature enabled until a dynamic regrouping command is sent by the dispatcher.

**Note:** If you try to access a zone or channel that has been reserved by the dispatcher as a dynamically regrouped mode for other users, an invalid tone sounds.

## Procedure:

- 1 When your radio is dynamically regrouped, it automatically switches to the dynamically regrouped channel. A “gurgle” tone sounds and the display shows the dynamically regrouped channel's name.
- 2 Press the **PTT** button to talk. Release **PTT** button to listen.

*When the dispatcher cancels dynamic regrouping, the radio automatically returns to the zone and channel that you were using before the radio was dynamically regrouped.*

### **Requesting a Reprogram (Trunking, Digital Mode Only)**



This feature lets you notify the dispatcher that you want a new dynamic regrouping assignment.

#### Procedure:

Press the preprogrammed **Reprogram Request** button to send reprogram request to the dispatcher and proceed to Step 3.

#### OR


Follow the procedure below.

- 1  or  to **RPGM**.
- 2 Press the **Menu Select** button directly below **RPGM** to send reprogram request to the dispatcher.
- 3 The display shows **REPROGRAM RQST** and **PLEASE WAIT**.

- 4 If you hear five beeps, the dispatcher has acknowledged the reprogram request. The display shows **ACK RECEIVED** and the radio returns to the Home screen.

#### OR

If the dispatcher does not acknowledge the reprogram request within six seconds, a low-pitched alert tone sounds and the display shows **NO ACKNOWLEDGE**.

Try again or press  to cancel and return to the Home screen.

### **Classifying Regrouped Radios**

The dispatcher can classify regrouped radios into either of two categories: **Select Enabled** or **Select Disabled**.

- Select-enabled radios are free to change to any available channel, including the dynamic-regrouping channel, once the user has selected the dynamic-regrouping position.
- Select-disabled radios cannot change channels while dynamically regrouped. The dispatcher has forced the radio to remain on the dynamic-regrouping channel.

The Scan or Private Call feature cannot be selected while your radio is Select Disabled.



## ■ Multiple Control Head Features

### 📄 Multiple Control Head Features

This feature allows a transceiver to control as many as four O5 control heads. You can use the CAN cables to connect in any configuration that does not exceed 131 feet (40 meters) in combined length. O5 Control Head Installation Manual (HLN6947) for further information.



If a keypad microphone is connected after the radio has been turned on, the radio **MAY** fail to detect it.

#### Caution

The Multiple Control Head feature consists of 2 modes:

- All Active mode
- One Active mode


Multiple Control Head (MCH) feature can be programmed via Customer Programming Software (CPS).

**Note:** If two or more control heads are connected to the system before enabling the MCH feature in the CPS, the radio will display **EXTRA CH** or **CH ID # ERR**. Both errors are **FATAL**.

### 📄 Setting the Initial Control Head's ID

This feature allows you to setup the control head in the **Front Panel Programming (FPP)** mode. During the setup, the control head are defined as Control Head Number 1, Control Head Number 2, Control Head Number 3 and Control Head Number 4.

#### Procedure:

- 1 Press the **Power** button to power off the radio.
- 2 Press and hold the left-most  button and the emergency button simultaneously.
- 3 While continuing to depress these two buttons, press the **Power** button to power on the radio and the control head.
- 4 The radio and the control head will power on into **FPP** mode. The display shows control head's ID number.
- 5 Turn the **Channel** knob to change the control head's ID number.
- 6 Repeat steps 1 to 4 above to set the ID number for the rest of the attached control heads.

## All Active Mode

The All Active mode enables all connected control heads of the radio to operate concurrently with each other. When you activate a feature on one control head, the rest of the control heads will have the same activated feature and indicator on their respective display.

The multiple control head feature allows only control heads of the same type to be connected. Upon power up, if a control head of a different type is connected to the radio, the radio reports the fatal error **CH MISMATCH** on the display of all attached control heads.

## Intercom Feature

The All Active mode allows you to use one of the control head to talk to the user at the other control heads.

**Note:** Only one intercom call can be initiated at one time.

### Procedure:

- 1 Press the **Menu Select** button directly below **INTC** to activate the intercom feature of any of the control head.
- 2 Press the **PTT** button to initiate an intercom transmission. All control heads that are attached will receive the same intercom call.
- 3 The display of the control heads receiving the intercom call shows the alias/ID number of the transmitting control head.

- 4 Press the **Menu Select** button directly below **EXIT** to deactivate the intercom feature.

**OR**

Press  to deactivate the intercom feature.

**OR**

Change to other mode to deactivate the intercom feature.

**OR**

### **Only in Emergency channel:**

pressing the **Emergency** button or the emergency footswitch on any control head also deactivates the intercom feature.

---

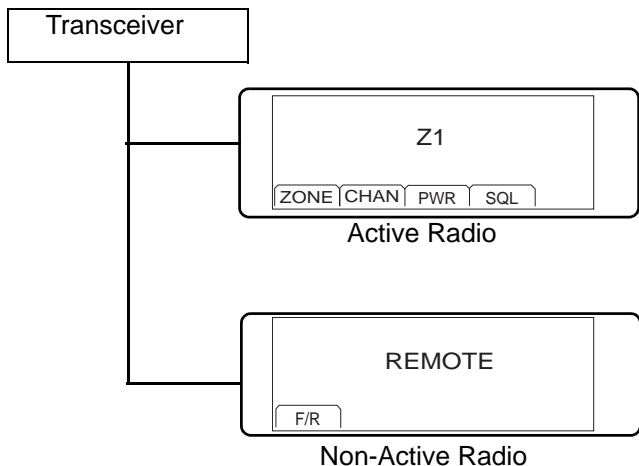
## One Active Mode

The One Active mode enables only one control head to be visibly active at a time in a **two** control head system. In the One Active mode, if more than two (2) control heads are present upon power up, the radio shows a fatal error **EXTRA CH** on the display of all attached control heads.

The active control head commands the system normally. In the meantime, the inactive control head is in remote mode with its display showing **REMOTE**.

The **Volume** knob, **DIM**, **Front/Rear (F/R)** softkey and **Emergency** buttons remain active on the inactive head, while all other controls are disabled. Emergency footswitch and VIP inputs are also still active on the inactive control head. However, VIP inputs must be connected to the head assigned ID #1.

**Note:** Only two (2) control heads are supported in the one active mode.



Follow the procedure below to toggle between the two control heads.

**Procedure:**

Press the **Menu Select** button directly below **F/R**.

**OR**

Press the **Menu Select** button preprogrammed user button on the keypad microphone.

### **Intercom Features**

The intercom feature allows a user at one control head to talk to the user at the other control heads of a Multiple Control Head configuration. At any given time, when a control head being operated has priority for the intercom call, all other control heads are blocked until the active control head releases **PTT** button.

This can be made on any attached control head. This feature only applies to control heads in the All Active mode.

**Procedure:**

- 1** Press the **Menu Select** button directly below **INTC** to activate the intercom feature.

---

- 2** Press the **PTT** button on the microphone of one of the control heads to initiate the audio transmission.


---

- 3** All control heads that are attached, receive the same intercom call. The display of the receiving control heads shows the alias/ID number of the transmitting control head.

---

Press the **Menu Select** button directly below **EXIT** to deactivate the intercom feature.

**OR**

Press  on any control head to deactivate the intercom feature.

The intercom feature also deactivates when user initiates a mode change. If the radio is on an emergency channel,

pressing of the **EMERGENCY** button or the emergency footswitch button on any control head also deactivates the intercom feature.

## ■ Contacts

This feature provides “address-book” capabilities on your radio. Each entry corresponds to an alias (name) or ID (number) that you use to initiate a call.

Contacts manages up to 2,500 contact entries, alphabetically sorted according to entry alias. Each alias can have up to 5 IDs of different call types associated with it.

Additionally, each entry, depending on context (conventional, trunking, or phone), associates with one or more of the four types of calls: Phone Call, Selective Call, Private Call, or Call Alert.

Each entry within Contacts displays the following information:

- Call Alias (Name)
- Call ID (Number)
- Call Type (Icon)
- WACN ID (Astro 25 Trunking IDs only)
- System ID

**Note:** Your radio must be preprogrammed to allow you to add, edit, or delete the contact entries.

Your radio also supports a maximum of 50 call lists. Each list can store up to 100 IDs (numbers).

**Note:** Your radio is preprogrammed with a number of contacts per Call Lists. Check with your dealer or system administrator for more information.

The radio automatically exits the feature, if the time-out timer is enabled, when the radio is left idle and the timer expires. You will hear the Menu Inactive Exit Tone upon feature exit.

### Making a Private Call from Contacts

**Note:** Your radio must be preprogrammed to allow you to use this feature.

#### **Procedure:**

Use the Options Menu.

- 1 **▶** or **◀** to **CNTS**.
- 2 Press the **Menu Select** button directly below **CNTS** to the call list. The display shows Contact Alias.
- 3 **▶** or **◀** to the required subscriber alias.
- 4 Press the **Menu Select** button directly below **OPTN**.
- 5 **▶** or **◀** to **CALL** and press the **Menu Select** button directly below **SEL**.

- 6 **▶** or **◀** to select the call type.

---

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

---

- 8 Press the **PTT** button to initiate the call. During the call, the display shows the subscriber alias.

---

- 9 Press and hold the **PTT** button to talk. The LED lights up solid red.  
**OR**  
Release the **PTT** button to listen. The LED lights up solid green.

---

- 10 If there is no voice activity for a programmed period of time, the call ends.  
**OR**  
The call ends when it reaches the maximum ring time.

**OR**

Use the **PTT** button:

- 1 **▶** or **◀** to **CNTS**.

---

- 2 Press the **Menu Select** button directly below **CNTS**.

---

- 3 **▶** or **◀** to the required subscriber alias.

---

- 4 Press the **Menu Select** button directly below **CNTS**. The display shows Contact Alias.

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

---

- 6 Press the **PTT** button to initiate the call. During the call, the display shows the subscriber alias.

---

- 7 Press and hold the **PTT** button to talk. The LED lights up solid red.  
**OR**  
Release the **PTT** button to listen. The LED lights up solid yellow.

---

- 8 If there is no voice activity for a preprogrammed period of time, the call ends.  
**OR**  
The call ends when it reaches the maximum ring time.

### Adding a New Contact Entry

**Procedure:**

- 1 **▶** or **◀** to **CNTS**.

---

- 2 Press the and hold **Menu Select** button directly below **CNTS**. The entries are alphabetically sorted.

---

- 3 **▶** or **◀** to **[NEW CONTACT]** and press the **Menu Select** button directly below **SEL**.

---

- 4 The display shows **NAME**.  
Use the keypad to enter the name.  
Press **◀** to move one space to the left.

Press **▶** to move one space to the right.

Press the **Menu Select** button below **DEL** to delete any unwanted characters.

Press **(\*)** to add a space.

Press **(0)** to toggle between mixed case mode, uppercase mode, and lowercase mode.

Press **(#)** to toggle between numeric and letter mode.

- 5** Press the **Menu Select** button directly below **OK** once you have entered the name.

**OR**

Press the **Menu Select** button directly below **CNCL** to return to the previous screen.

- 6** **▶** or **◀** to **[ADD NUMBER]** and press the **Menu Select** button directly below **SEL**. The display shows **TYPE 1 <DEFAULT TYPE>**.

- 7** Press **Menu Select** button directly below **EDIT**.

- 8** **▶** or **◀** to the required channel and press the **Menu Select** button directly below **SEL**.

- 9** **▶** or **◀** to **NUMBER 1** and press the **Menu Select** button directly below **EDIT**. The display shows **NUMBER 1** and a cursor appears.

Use the keypad to enter the number.

Press **◀** to move one space to the left.

Press **▶** to move one space to the right.

Press the **Menu Select** button directly below **DEL** to delete any unwanted characters.

- 10** Press the **Menu Select** button directly below **OK** once you have entered the number.

**OR**

Press the **Menu Select** button directly below **CNCL** to return to the previous screen.

- 11** Press the **Menu Select** button directly below **DONE** once you have finished.
- 12** The display shows **<ENTRY> STORED**, confirming that the contact entry has been added.
- 13** The radio returns to the main Contacts screen.

### Deleting a Contact Entry

**Procedure:**







- 1** **▶** or **◀** to **CNTS**.
- 2** Press the **Menu Select** button directly below **CNTS**. The entries are alphabetically sorted.
- 3** **▶** or **◀** to the entry you want to delete and press the **Menu Select** button directly below **OPTN**.
- 4** **▶** or **◀** to **DELETE** and press the **Menu Select** button directly below **SEL**. The display shows **<ENTRY> CONFIRM DEL?**.
- 5** Select **YES** to delete the entry. The display shows **<ENTRY> DELETED** and the radio returns to the main screen for Contacts.

OR

Select **NO** to return to the main screen for Contacts.

### Adding a Contact to a Call List or Phone List

**Procedure:**












- 1  or  to **CNTS**.
- 2 Press the **Menu Select** button directly below **CNTS**. The entries are alphabetically sorted.
- 3  or  to the entry you want to add to the call list and press the **Menu Select** button directly below **OPTN**.
- 4  or  to **ADD TO CALLST** or **ADD TO PHONLST** and press the **Menu Select** button directly below **SEL**.
- 5 The display shows **<ENTRY> ADDED TO CALLST** or **ADDED TO PHONLST**, confirming the addition of the contact to the list.
- 6 The radio returns to the main display for Contacts.

### Editing a Contact in a Call List or a Phone List

#### Editing an Entry Alias

**Procedure:**

- 1  or  to **CNTS**.

- 2 Press the **Menu Select** button directly below **CNTS**. The entries are alphabetically sorted.
- 3  or  to the entry you want to edit and press the **Menu Select** button directly below **OPTN**.
- 4  or  to **EDIT** and press the **Menu Select** button directly below **SEL**.
- 5  or  to the entry alias you wish to change and press the **Menu Select** button directly below **EDIT**.
- 6 A cursor appears.  
Use the keypad to edit the name.  
Press  to move one space to the left.  
Press  to move one space to the right.  
Press the **Menu Select** button below **DEL** to delete any unwanted characters.  
Press  to add a space.  
Press  to toggle between mixed case mode, uppercase mode, and lowercase mode.  
Press  to toggle between numeric and letter mode.
- 7 Press the **Menu Select** button directly below **OK** once you have finished. The display returns to the Edit Contact screen.
- 8 Press the **Menu Select** button directly below **DONE** to save your changes and return to the main screen for Contacts.

## Editing as Entry ID

### Procedure:

- 1 **▶** or **◀** to **CNTS**.

---

- 2 Press the **Menu Select** button directly below **CNTS**. The entries are alphabetically sorted.

---

- 3 **▶** or **◀** to the entry you want to edit and press the **Menu Select** button directly below **OPTN**.

---

- 4 **▶** or **◀** to **EDIT** and press the **Menu Select** button directly below **SEL**.

---

- 5 **▶** or **◀** to the entry ID you wish to change and press the **Menu Select** button directly below **EDIT**.

---

- 6 A cursor appears.  
Use the keypad to edit the number.  
Press **◀** to move one space to the left.  
Press **▶** to move one space to the right.  
Press the **Menu Select** button below **DEL** to delete any unwanted characters.  
Press **(\*)** to add a space.  
Press **(0)** to toggle between mixed case mode, uppercase mode, and lowercase mode.  
Press **(#)** to toggle between numeric and letter mode.

---

- 7 Press the **Menu Select** button directly below **OK** once you have finished. The display returns to the Edit Contact screen.

---

- 8 Press the **Menu Select** button directly below **DONE** to save your changes and return to the main screen for Contacts.

---

## Editing a Call Type

### Procedure:

- 1 **▶** or **◀** to **CNTS**.

---

- 2 Press the **Menu Select** button directly below **CNTS**. The entries are alphabetically sorted.

---

- 3 **▶** or **◀** to the entry you want to edit and press the **Menu Select** button directly below **OPTN**.

---

- 4 **▶** or **◀** to **EDIT** and press the **Menu Select** button directly below **SEL**.

---

- 5 **▶** or **◀** to **TYPE** and press the **Menu Select** button directly below **EDIT**.

---

- 6 **▶** or **◀** to choose from the list of call types given and press the **Menu Select** button directly below **OK** to select.

---

- 7 The display returns to the Edit Contact screen.

---

- 8 Press the **Menu Select** button directly below **DONE** to save your changes and return to the main screen for Contacts.

---



## ■ Scan Lists


---

Scan lists are created and assigned to individual channels/groups. Your radio scans for voice activity by cycling through the channel/group sequence specified in the scan list for the current channel/group.

Your radio can support up to 125 different scan lists. These lists must be preprogrammed by a qualified radio technician.

### Viewing a Scan List



#### Procedure:

- 1  to **SCNL**


---

- 2 Press the **Menu Select** button directly below **SCNL**.

---

- 3  or  to view the members on the list.

---

- 4 Press the  to exit the current display and return to the Home screen.

---

### Editing the Scan List

This feature lets you change scan list members and priorities.

**Note:** The maximum number of members for a trunking priority monitor scan list is 50; for a conventional scan list, 30; and for a talkgroup scan list, 250.

#### Procedure:



Long press the preprogrammed **Scan List Programming** button (side button) and proceed to Step 3.

#### OR

Move the preprogrammed **Scan List Programming** switch to programming position and proceed to Step 3.

#### OR



Follow the procedure below.

- 1  or  to **SCNL**.

---

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

---

- 3  or  to the entry you want to edit.

---



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

**OR**

Press the **Menu Select** button directly below **DEL** to delete the currently displayed channel from the scan list.

**OR**

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

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

**OR**

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


**OR**

Use the **Channel Knob** to select additional channels to be added or deleted.

---

- 6 Move the **Scan List Programming** switch out of programming position.

**OR**

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

---

### **Changing the Scan List Status**



**Procedure:**

- 1 Long press the preprogrammed **Scan List Programming** button (side button).



---

- 2 The display shows the programming mode icon and the first list member.



---

- 3  or  to the number you want to edit.

---

- 4 Press the  button or press the **Menu Select** button directly below **SEL** once to add the currently displayed channel to the scan list.  
**OR**  
Press the  button or press the **Menu Select** button directly below **SEL**, one or more times to change the scan list status icon of the currently displayed channel.

---

- 5  or  to select more list members whose scan status you want to change.

**OR**

Use the keypad to go directly to that scan list member.


**OR**

Use the **Channel Knob** to select another scan list member.

---

- 6 Long press the **Scan List Programming** to switch out of programming position.


**OR**

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

---

### **Viewing and Changing the Priority Status**

**Procedure:**

- 1 At the below **SEL**, **DEL**, and **RCL** screen, press the **Menu Select** button directly below **SEL** to view and/or change the priority status of the currently displayed channel.  
**OR**  
At the below **SEL**, **DEL**, and **RCL** screen, press the  button or press the **Menu Select** button directly below **SEL**, one or more times to view and/or change the scan list status icon of the currently displayed channel.

---

- 2 A Scan icon indicates that the current channel is in the scan list as a non-priority channel. The LED lights up solid green.  
**OR**  
A Priority-Two Channel Scan icon indicates that the current channel is in the scan list as the Priority-Two channel. The LED blinks green.  
**OR**

A Priority-One Channel Scan icon indicates that the current channel is in the scan list as the Priority-One channel. The LED rapidly blinks green. You hear all traffic on the Priority-One channel, regardless of traffic on non-priority channels.

**OR**

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

## ■ Scan

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

### 📄 Turning Scan On or Off

#### Procedure:

Press the preprogrammed **Scan** button, or turn the preprogrammed Scan switch to the Scan on or Scan off position, to start or stop scan.

**OR**

Follow the procedure below.

- 1 ▶ to **SCAN**.
  - 2 Press the **Menu Select** button directly below **SCAN**.
  - 3 The display shows **SCAN OFF** if scan is disabled. Press the **Menu Select** button directly below **SCAN** to enable scan.
- OR**
- The display shows **SCAN ON** and the scan status icon if

scan is enabled. Press the **Menu Select** button directly below **SCAN** to disable scan.

- 4 The radio returns to the Home screen.

### 📄 Turning Scan On While Disregarding the Squelch Code (Conventional Channels Only)

#### Procedure:

- 1 ▶ to **MON**.
- 2 Press the **Menu Select** button directly below **MON**.
- 3 The brief **MONITOR ON** display indicates that the radio is disregarding the squelch code.

*While scanning for activity, you can still receive fleetwide, system-wide, dynamic regrouping, incoming telephone interconnect and Private Conversation/Call Alert calls.*

*Respond to these types of calls as you would normally on the selected channel. However, when scanning different channels while in talkgroup scan, incoming Private Conversation/Call Alert calls may be missed.*

### 📄 Transmitting While the Scan is On

### 📄 Radio Programmed for Talkback Scan

## Procedure:

- 1 Press the **PTT** button to transmit on the channel indicated by the display.
- 


*The radio does not begin scanning again for a predetermined hang time after you release the **PTT** button, allowing the other party to respond. If the other party responds within the hang time, scanning does not resume until the full hang time expires after they have finished speaking, allowing the conversation to be completed.*

*To transmit on the selected channel if another channel is active, first turn scan off by pressing the **Menu Select** button below **SCAN** momentarily.*

## **Radio Programmed for Non-Talkback Scan**

### Procedure:

- 1 Press the **PTT** button at any time to transmit on the selected channel or fixed channel.
- 



*To make a Call Alert page, or Private Conversation call while scanning, press either the **Menu Select** button directly below **PAGE** or **CALL**. The call is entered on the selected channel and scanning is halted until the call is exited by pressing  or pressing the **Menu Select** button below either **PAGE** or **CALL**.*

## **Deleting a Nuisance Channel**

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

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

### Procedure:

- 1 When the radio is locked onto the channel to be deleted,  or  to **NUIS**.

---

  - 2 Press the **Menu Select** button directly below **NUIS**.

---

  - 3 Press the **Menu Select** button directly below **DELETE**.
- 

## **Restoring a Nuisance Channel**

### Procedure:

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

- Turn scan off, then on.  
**OR**
- Change modes.  
**OR**
- Turn off the radio, and then turn it back on.

*Nuisance mode delete can be disabled by the system administrator.*

## Changing Priorities Status While Scan is On


While the radio is scanning, the dynamic priority change feature allows you to temporarily change any channel in a scan list (except for the Priority-One channel) to the Priority-Two channel.

This change remains in effect until scan is turned off. Scan then reverts to the preprogrammed (original) setting.

### Procedure:

- 1 Press the **Menu Select** button directly below **DYNP** to change the priority of a non-priority channel in the scan list to Priority-Two.

---

- 2 Press  momentarily to exit the scan list and resume scanning.

---

## Restoring Priorities in a Scan List

### Procedure:

To restore the original channel priorities in a scan list, do one of the following:

- Press the **Menu Select** button directly below **RCL**.  
**OR**
- Turn scan off, then on.  
**OR**
- Change channels.  
**OR**
- Turn off the radio, and then turn it back on.

## Hang Up (HUB)

To temporarily suspend Scan Mode operation, remove the control head from the Hang Up Box (HUB). You are allowed to use the control head while scan is suspended. However, Priority Member scanning is not suspended. This feature applies to all Scan Lists and Scan Types. Scan is resumed once the control head is returned to the holding clip and the preprogrammed hang time has elapsed.

**Note:** Priority Scan List members are continuously scanned only when the Scan List, **Designated Tx Member** field is set to “Talkback” in the radio programming. Otherwise, all scan mode operation is suspended.

## ■ Call Alert Paging

This feature allows your radio to work like a pager.

Even if other users are away from their radios, or if they are unable to hear their radios, you can send them an individual Call Alert page. You can also verify if a radio is active on the system.

Depending on how your radio is programmed, when you make an Enhanced Private Call, the radio either automatically sends a call alert page if there is no answer after the maximum ring time, **OR** when you press the **PTT** button.

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

### 📄 Answering a Call Alert

#### Procedure:

- 1 When you receive a Call Alert page, you hear four repeating alert tone and the green LED blinks.

---

- 2 The call received icons blinks and the display shows **PAGE RECEIVED**.

---

- 3 Press the **PTT** button to answer.  
**OR**  
Press any button to clear the Call Alert page.

---

See *Making a Talkgroup Call on page 28* or *Making a Private Call (Trunking, Digital Mode Only) on page 28* for more information on returning the call.

### 📄 Sending a Call Alert Page

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

#### Procedure:

Press the preprogrammed **Quick Access (One-Touch) Call Alert Paging** button to send a page to the preprogrammed ID and proceed to Step 5 of the procedure below.

#### **OR**

Follow the procedure below.

- 1 **▶** or **◀** to **PAGE**.

---

  - 2 Press the **Menu Select** button directly below **PAGE**.

---

  - 3 **▶** or **◀** to select the required ID.

---

  - 4 Press the **PTT** button to send the page.

---

  - 5 The display shows **PAGING...<NUMBER>** or **<ALIAS>**.

---

  - 6 If the call alert page is sent successfully, a tone sounds and the display shows **ACK RECEIVED**.
- OR**

If the call alert page is not acknowledged, a low tone sounds and the display shows **NO ACKNOWLEDGE**.

- 7 The radio returns to the Home screen.

**OR**

Press the **Menu Select** button directly below **OK** to return to the main screen for Contacts.

**OR**

Follow the procedure below.

- 1 **▶** or **◀** to **CALL**.
- 2 Press the **Menu Select** button directly below **CALL**.
- 3 **▶** or **◀** to select the required ID, press the **PTT** button to initiate the call.
- 4 If the target radio does not respond after a preprogrammed period of time, the display shows **SEND PAGE?**.
- 5 Press the **Menu Select** button directly below **YES** to send the call alert page.  
**OR**  
Press the **Menu Select** button directly below **NO** to exit the screen without sending the call alert page.
- 6 The display shows **PAGING...<ALIAS>**.
- 7 If the call alert page is sent successfully, a tone sounds and the display shows **ACK RECEIVED**.  
**OR**

If the call alert page is not acknowledged, a low tone sounds and the display shows **NO ACKNOWLEDGE**.

- 8 The radio returns to the Home screen.

**OR**

Press the **Menu Select** button directly below **OK** to return to the main screen for Contacts.

### In-Call User Alert

You can enable and disable voice transmission, if needed.

#### **Procedure:**

- 1 Make sure you are in **Home** mode where the default zone and mode are being displayed.
- 2 **▶** or **◀** to scroll to the **VMUT**.
- 3 Press the **Menu Select** button directly below **VMUT**.
- 4 Press the **Menu Select** button directly below **VMUT** or the **VMut** preprogrammed button again to turn the feature off and you will be able to hear to normal dispatch calls.

*Pressing the **Menu Select** button directly below **VMUT** or the **VMut** programmed button momentarily toggles between Voice mute on and Voice mute off. **VOICE MUTE ON** shown on the display indicates that the radio is muted to normal dispatch calls.*

## ■ Emergency Operation

---

The Emergency feature is used to indicate a critical situation.

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

Your radio supports 5 Emergency Alarms:

- Emergency Call
- Emergency Alarm
- Emergency Alarm with Call
- Silent Emergency Alarm
- Special Considerations for Emergencies

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

Only **one** of the Emergency Alarms above can be assigned to the preprogrammed **Emergency** button or the **Emergency** footswitch.

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

## Sending an Emergency Alarm

This feature allows you to send a data transmission, which identifies the radio sending the emergency, to the dispatcher.

### Procedure:

- 1** Press preprogrammed **Emergency** button. A tone sounds and the display alternates **EMERGENCY** and the home display.
- 2** A dispatcher acknowledgment **ACK RECEIVED** display follows.  
**AND, Trunking Only:**  
A high-pitched tone indicates that the alarm has been received by the trunked system's central controller.
- 3** The radio automatically returns to normal operation. No further action is required.

## Sending an Emergency Call

### Procedure:

- 1** Press preprogrammed **Emergency** button. A tone sounds and the display alternates **EMERGENCY** and the home display.
- 2** Press the **PTT** button and announce your emergency.
- 3** After completing the emergency call, press and hold the emergency button until a tone sounds.



- 4 The **EMERGENCY** display disappears, and the radio returns to normal operation.
- 

### Sending an Emergency Alarm with Emergency Call

This feature allows you send an Emergency Alarm to another radio. Upon acknowledgement, both radios can communicate over a programmed Emergency channel.

If the radio has both emergency call and alarm features, it automatically proceeds to the call mode after the alarm is acknowledged.

#### Procedure:

- 1 Press the preprogrammed **Emergency** button to activate the emergency call/alarm feature.

---

- 2 The display alternates **EMERGENCY** and the home display.

---

- 3 A high-pitched tone sounds, indicating that the alarm has been received by the trunked system's central controller. A dispatcher acknowledgment (four high-pitched tones) follows, accompanied by an **ACK RECEIVED** display.

---

- 4 Press the **PTT** button and announce your emergency.

---

- 5 Press and hold the emergency button until a tone sounds to exit from the emergency state altogether.

---

- 6 The **EMERGENCY** display disappears, and the radio returns to normal operation.
- 

*Turning the radio off also cancels the emergency state.*

### Sending a Silent Emergency Alarm

This feature allows you to send an Emergency Alarm to another radio without any audio or visual indicator.

Upon acknowledgement, your radio's microphone is automatically activated, allowing you to communicate with the other radio without pressing the **PTT** button.

This activated microphone state is also known as "**hot mic**".

**Note:** If you press the PTT button during hot mic, and continue to press it after the hot mic duration expires, the radio continues to transmit until you release the PTT button.

#### Procedure:

- 1 Press the preprogrammed **Emergency** button to activate the silent alarm feature.

---

- 2 Press and hold the emergency button until a tone sounds to exit the silent alarm mode.

---

*If silent emergency alarm is used with emergency call, pressing the **PTT** button exits the silent mode and initiates the emergency call.*

## Special Considerations for Emergencies

- If you press the emergency button while in a channel that has no emergency capability, a low-pitched tone sounds.
- If the unit is out of the range of the system and/or the emergency alarm is not acknowledged, a tone sounds and the display shows **NO ACKNOWLEDGE**.
- If you press the emergency button, then change to a mode that has no emergency capability, the display shows **NO EMERGENCY** and a continuous low-pitched tone sounds until a valid emergency mode is selected or until the emergency is cancelled.
- When an emergency is active, changing to another mode where emergency is enabled (trunked or conventional) causes an emergency alarm and/or emergency call to be active on the new mode.

## ■ Automatic Registration Service (ARS)

This feature provides an automated data application registration for the radio. When you turn on the radio, the device automatically registers with the server.

Data applications within the fixed network can determine the presence of a device on the system and send data to the device. For example: Text Messaging Service (TMS).


The Automatic Registration Service for the radio consists of two (2) modes:

- ARS Server Mode (default mode)
- ARS Non Server Mode

**Note:** The default ARS mode can be changed by a qualified radio technician using the radio's programming software.

## Selecting or Changing ARS Mode

### Procedure:

- 1 After the zone you want is displayed, toggle until the display shows the required channel.  
**OR**  
▶ and hold to **CHAN**.
- 2 Press the **Menu Select** button directly below **CHAN**.  
The display shows the current zone and the channel blinking.
- 3 ▶ or rotate the **Channel Knob** to the desired channel.
- 4 Press  to confirm the displayed zone and channel.

## Accessing the User Login Feature

This feature allows you as the user to be associated with the radio. With this association, every data application (Example: Text Messaging Service) will take on a friendly username.

You can still send text messages without logging in as a user. The user login feature only enables the recipient of your message to identify you as the sender by assigning a username to your message.

The user login feature can be accessed by selecting a menu item on the display or through a programmable button.


**Note:** Valid characters for a username entry are capital letters A-Z, small letters a-z, numbers 0-9, '\*', '#', '-', '/' and the space character.

The maximum length for a username is eight (8) characters. Usernames are not case sensitive in server mode but are case sensitive in non-server mode.

A predefined username may sometimes be invalid because the programming software that is used to set predefined usernames allows you to set usernames comprising of eight (8) characters or more.

## Logging In as a User

**Procedure:**

- 1  to **USER**.

---

- 2 Press the **Menu Select** button directly below **USER**.

---

- 3 The display shows the User Login screen.


---

- 4 Press the **Menu Select** button directly below **ID**.


---

- 5 A blinking cursor appears beside ID. Use the keypad to enter a username using the keypad multi-tap function.
 

**OR**

 to scroll through the list of predefined usernames. Press the **Menu Select** button to select a predefined username.

**OR**

Press and hold  to scroll through the list of predefined usernames at a fast scroll rate. Press the **Menu Select** button to select a predefined username.

---

- 6 If the selected predefined username has more than eight (8) characters, or an invalid character in it, the display momentarily shows Invalid ID. Repeat Step 5.
 

**OR**

Press the **Menu Select** button directly below **PIN**.

---

- 7 A blinking cursor appears beside **PIN**. Enter your Personal Identification Number (PIN) number.

The maximum PIN length is 4 digits. The PIN number will appear as asterisks.

- 8 Press the **Menu Select** button directly below **LOGN**.
- 9 In ARS server mode, the display shows the User Login Indicator icon, the ID, **IN PPROGRESS** and **CNCL**.  
**OR**  
In ARS non-server mode, the display shows the User Login Indicator icon, the ID, **LOGGED IN** and **LOGT**.  
In non-ARS enabled mode, the display shows **OFFLINE** and **LOGT**.
- 10 If the username is invalid, login fails and the user login failure indicator (IP indicator) icon blinks. The display also momentary shows **LOGIN FAILED**. Repeat step 5.  
**OR**  
If the PIN is invalid, login fails and the user login failure indicator (IP indicator) icon blinks. The display also momentary shows **LOGIN FAILED**. Repeat Step 7.  
**OR**  
Press the **Menu Select** button directly below **CNCL** to cancel the login in progress screen and return to the initial user login screen.  
**OR**  
Wait for the logged in confirmation screen. If the login process is successful, the display shows the successful user login indicator (IP indicator) icon and **LOGGED IN** and **LOGT**.

## **Logging Out**

### **Procedure:**

- 1 ▶ to **LOGT**.
- 2 Press the **Menu Select** button directly below **LOGT**.
- 3 Display shows the User Login Indicator icon and **CLEAR PRIVATE DATA?**.
- 4 Select **YES** to clear all your private data. The display shows momentary **PRIVATE DATA CLEARED**.  
**OR**  
Select **NO** to keep your private data.

*Private data refers to all messages in the text messaging Inbox, Draft and Sent folder. The next radio user will be able to access your Inbox, Draft and Sent messages if private data is not deleted.*

## ■ Text Messaging Service (TMS)

---

This feature allows you to send and receive text messages. The **maximum** length of characters for a text message is **200**.

There are three (3) types of text messages:

- A new text message (free form message)
- A predefined message (quick text message)
- An edited quick text message

The main menu consists of the following options:

- Inbox
- Compose
- Drafts
- Sent

**Note:** See **Status Icons** on page 17 for more details on the TMS icons and **TMS Menu Options** on page 18 for more details on each menu option.

## 📄 Accessing TMS Feature

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

Press the **Menu Select** button directly below **BACK** at any time to return to the previous screen.

### **Procedure:**

Press the preprogrammed **Data Feature** button or the **TMS** button to access the TMS feature screen.

### **OR**

Press and hold the preprogrammed **Data Feature** button or the **TMS** button to access the Inbox screen.

### **OR**

Follow the procedure below.

- 1 **▶** or **◀** to **TMS**.

---

- 2 Press the **Menu Select** button directly below **TMS** to access the TMS feature screen.

---

- 3 **▶** or **◀** to scroll through the main menu options.

---

## 📄 Composing and Sending a New Text Message

**Note:** During the uppercase and lowercase mode, multi-tapping the keys only scrolls through the letters. For example, **A->B->C**, **a->b->c**.

During the num lock mode, except for **1**, pressing the keypad only enters the numeric digits. Subsequent presses of the same key inserts the same digit to the text message (no multi-tap).

### Procedure:

- 1 **▶** or **◀** to **TMS**.

---

- 2 Press the **Menu Select** button directly below **TMS** to access the TMS feature screen.

---

- 3 **▶** or **◀** to **COMPOSE** and press the **Menu Select** button directly below **SEL**.  
**OR**  
Press the **Menu Select** button directly below **EXIT** to return to the TMS feature screen.

---

- 4 **▶** or **◀** to **TEXT MESSAGE** and press the **Menu Select** button directly below **SEL** to compose a new message.

---

- 5 A blinking cursor appears on the **COMPOSE** screen. Use the keypad to type or edit your message.  
Press **◀** to move one space to the left.  
Press **▶** to move one space to the right.

Press the **Menu Select** button below **DEL** to delete any unwanted characters.

Press **Ⓢ** to add a space.

Press **⓪** to toggle between mixed case mode, uppercase mode, and lowercase mode.

Press **Ⓝ** to toggle between numeric and letter mode.

- 6 Press the **Menu Select** button directly below **OPTN** once the message is composed.

---

- 7 **▶** or **◀** to **SEND MESSAGE** and press the **Menu Select** button directly below **SEL**.

---

- 8 **▶** or **◀** to scroll through the address list and press the **Menu Select** button below **SEL** to select the required address.  
**OR**  
**▶** or **◀** to **[OTHER RECPNT]** and press the Menu Select button below **EDIT**.  
A blinking cursor appears in the **ENTER ADDRESS** screen. Use the keypad to type the address entry.  
Press the **Menu Select** button below **DEL** to delete any unwanted characters.  
Press **Ⓢ** to add a space.  
Press **⓪** to toggle between mixed case mode, uppercase mode, and lowercase mode.  
Press **Ⓝ** to toggle between numeric and letter mode.

---

- 9 Press the **Menu Select** button below **SEND** to send the message.

OR

Press the **PTT** button to send the message.

**10** The display shows the **SEND MESSAGE** screen and **SENDING MSG.**

**11** If the message is sent, a tone sounds and the display shows **MSG SENT.**

OR

If the message is not sent, a low tone sounds and the display shows **SEND FAILED.**

*If the message fails to send, the radio returns you to the main TMS screen.*

**Note:** You can append a priority status and/or a request reply to your message. See **Using the Priority Status and Request Reply Features** on **page 61** for more information.

You can also select the **SAVE TO DRAFTS** option to save your message in the Drafts folder to send it at a later time. See **Accessing the Drafts Folder** on **page 65** for more details.

## Sending a Quick Text Message

Quick Text messages are messages that are predefined and usually consist of messages that are used most frequently.









Each Quick Text message has a **maximum** length of 50 characters.

### Procedure:

Press the preprogrammed **Quick Text** button and proceed to Step 3.

OR

Follow the procedure below.

- 1**  or  to **TMS**.
- 2** Press the **Menu Select** button directly below **TMS** to access the TMS feature screen.
- 3**  or  to **COMPOSE** and press the **Menu Select** button directly below **SEL**.  
OR  
Press the **Menu Select** button directly below **EXIT** to return to the TMS feature screen.
- 4**  or  to **QUICK TEXT** and press the **Menu Select** button directly below **SEL** for a predefined message.
- 5**  or  to scroll through the list of messages and press the **Menu Select** button directly below **SEL** to select the required message.

- 6 The message appears on the **COMPOSE** screen, with a blinking cursor at the end of it.
- 
- 7 Press the **Menu Select** button directly below **OPTN**.
- 
- 8 **▶** or **◀** to **SEND MESSAGE** and press the **Menu Select** button directly below **SEL** to send the message.
- 
- 9 The message appears on the **Compose** screen, with a blinking cursor at the end of it. Use the keypad to edit the message, if required.  
Press the **Menu Select** button below **DEL** to delete any unwanted characters.  
Press **(\*)** to add a space.  
Press **(0)** to toggle between mixed case mode, uppercase mode, and lowercase mode.  
Press **(#)** to toggle between numeric and letter mode.
- 
- 10 Press the **Menu Select** button directly below **OPTN**.
- 
- 11 **▶** or **◀** to **SEND MESSAGE** and press the **Menu Select** button directly below **SEL**.
- 
- 12 **▶** or **◀** to scroll through the address list and highlight the required address.  
**OR**  
**▶** or **◀** to **[OTHER RECPNT]** and press the **Menu Select** button below **EDIT**.  
A blinking cursor appears in the **ENTER ADDRESS** screen. Use the keypad to type the address entry.  
Press the **Menu Select** button below **DEL** to delete any

unwanted characters.

Press **(\*)** to add a space.

Press **(0)** to toggle between mixed case mode, uppercase mode, and lowercase mode.

Press **(#)** to toggle between numeric and letter mode.

- 13 Press the **Menu Select** button below **SEND** to send the message.  
**OR**  
Press the **PTT** button to send the message.
- 
- 14 The display shows the **SEND MESSAGE** screen and **SENDING MSG**.
- 
- 15 If the message is sent, a tone sounds and the display shows **MSG SENT**.  
**OR**  
If the message is not sent, a low tone sounds and the display shows **SEND FAILED**.

*If the message fails to send, the radio returns you to the main TMS screen.*

**Note:** You can append a priority status and/or a request reply to your message. See **Using the Priority Status and Request Reply Features** on **page 61** for more information.



## Using the Priority Status and Request Reply Features

Before sending your message, you can append a priority message and/or a request reply to your message.

### *Appending a Priority Status to a Text Message*

**Note:** The Priority Message icon on a message does not imply that the message gets higher priority over the other messages when it is being transmitted. It is just an indication that can be embedded into a message to let the receiver know that the message is important.

#### **Procedure:**

After the outgoing message is composed (*Composing and Sending a New Text Message* on **page 58** for more information):

- 1** Press the **Menu Select** button directly below **OPTN**.

---

- 2** **▶** or **◀** to **MARK IMPORTANT** and press the **Menu Select** button directly below **SEL** to indicate the message as important.

---

- 3** The priority status icon appears beside the normal message icon on the label bar.

---

### *Removing a Priority Status from a Text Message*

#### **Procedure:**

After the outgoing message is composed (see *Composing and Sending a New Text Message* on **page 58** for more information):

- 1** Press the **Menu Select** button directly below **OPTN**.

---

- 2** **▶** or **◀** to **MARK AS NORMAL** and press the **Menu Select** button directly below **SEL** to remove the priority status from the message.

---

- 3** The display shows the normal message icon on the label bar.

---

## **Appending a Request Reply to a Text Message**

### **Procedure:**

After the outgoing message is composed (see **Composing and Sending a New Text Message** on **page 58** for more information):

- 1 Press the **Menu Select** button directly below **OPTN**.
- 2 **▶** or **◀** to **MARK AS NORMAL** and press the **Menu Select** button directly below **SEL** to indicate the message as important.  
**AND**  
**▶** or **◀** to **NO REQ REPLY** and press the Menu Select button directly below **SEL** to request for a reply.
- 3 The priority status and request reply icons appear beside the normal message icon on the label bar.

## **Removing a Priority Status and a Reply Request from a Text Message**

### **Procedure:**

After the outgoing message is composed (see **Composing and Sending a New Text Message** on page 64 for more information):

- 1 Press the **Menu Select** button directly below **OPTN**.
- 2 **▶** or **◀** to **MARK AS NORMAL** and press the **Menu Select** button directly below **SEL** to indicate the message as important.  
**AND**  
**▶** or **◀** to **NO REQ REPLY** and press the Menu Select button directly below **SEL** to request for a reply.
- 3 The display shows the normal message icon on the label bar.

## Managing Text Messages

### Receiving a Text Message

**Note:** When you receive a message that is flagged with the “Request Reply” icon, you must manually respond to the sender that you have received the message. The system will not automatically send back a notification that the radio has received such message.

#### Procedure:

When you receive a message, press and hold the preprogrammed **Data Feature** button or the **TMS Feature** button to access the Inbox and go to Step 3.

OR

Follow the procedure below.

- 1 The new message icon appears and the display momentarily shows **NEW MSG**.

---

- 2 Press the **Menu Select** button directly below **TMS** to access the message.

---

- 3 The display shows alias or ID with the sender of the latest received message on top.

---

### Viewing a Text Message from the Inbox

The Inbox can hold up to thirty (30) messages.

**Note:** ▶ or ◀ to read the message if fills more than one screen.

#### Procedure:

Press the preprogrammed **Data Feature** button or the **TMS Feature** button to access the TMS feature screen, and proceed to Step 3.

OR

Press and hold the preprogrammed **Data Feature** button or the **TMS Feature** button to access the Inbox screen and proceed to Step 4.

OR

Follow the procedure below.

- 1 ▶ or ◀ to **TMS**.

---

- 2 Press the **Menu Select** button directly below **TMS** to access the TMS feature screen.

---

- 3 ▶ or ◀ to **INBX** and press the **Menu Select** button below **SEL**.

---

- 4 The display shows alias or IDs, with the sender of the latest received message.

---

- 5 ▶ or ◀ to the required aliases or ID and press the **Menu Select** button below **SEL** to view the message.

---

While on the review message screen, press the **Menu Select** button directly below **OPTN**, **DEL**, or **BACK** to access the option.

- Select **OPTN** to configure the message settings.
- Select **DEL** to delete the message.
- Select **BACK** to return to the previous screen.

**Note:** The icon at the top right corner of the screen indicates the status of the message. See **Text Messaging Service (TMS)** on **page 57** for more information.

## **Replying to a Received Text Message**

**Note:** The original date and time stamp, address and message content is automatically appended to the reply message.

### **Procedure:**

- 1 **▶** or **◀** to the required aliases or ID and press the **Menu Select** button below **SEL** to view the message.

---
- 2 Press the **Menu Select** button directly below **RPLY** to reply to a message.

---
- 3 **▶** or **◀** to **TEXT MESSAGE** and press the **Menu Select** button directly below **SEL**.  
**OR**  
**▶** or **◀** to **Quick Text** and press the **Menu Select** button directly below **SEL** for a predefined message.  
**OR**  
**▶** or **◀** to scroll through the list of messages and press the **Menu Select** button directly below **SEL** to select the required message.

---
- 4 A blinking cursor appears on the **COMPOSE** screen.  
**OR**  
The predefined message appears on the **Compose** screen, with a blinking cursor at the end of it.

---
- 5 Use the keypad to type or edit your message.  
Press **◀** to move one space to the left.

Press **▶** to move one space to the right.

Press the **Menu Select** button below **DEL** to delete any unwanted characters.

Press **(★)** to add a space.

Press **(0)** to toggle between mixed case mode, uppercase mode, and lowercase mode.

Press **(#)** to toggle between numeric and letter mode.

**6** Press the **Menu Select** button directly below **OPTN** once you have finished writing the message.

**7** **▶** or **◀** to **SEND MESSAGE** and press the **Menu Select** button directly below **SEL** to send the message.

**8** The display shows the **SEND MESSAGE** screen and **SENDING MSG.**

Press the **Menu Select** button directly below **BACK** at any time to return to the previous screen.

**Note:** You can append a priority message and/or a request reply to your message. **Using the Priority Status and Request Reply Features** on page 61 for more details.

## **Accessing the Drafts Folder**

This folder stores the messages that were saved previously. The Drafts folder can hold up to 10 messages. The oldest draft in the folder is deleted when the 11th message comes in.

### **Procedure:**

**1** **▶** or **◀** to **TMS**.

**2** Press the **Menu Select** button directly below **TMS** to access the TMS feature screen.

**3** **▶** or **◀** to **DRAFTS** and press the **Menu Select** button below **SEL**.

**4** The display shows a list of drafts, with the latest text message drafted on top.

**5** **▶** or **◀** to the required text message press the **Menu Select** button below **SEL** to view the message.

Press the **Menu Select** button directly below **EDIT**, **DEL**, or **BACK** to access the option.

- Select **EDIT** to edit the message before sending it.
- Select **DEL** to delete the message.
- Select **BACK** to return to the previous screen.

## Managing Sent Text Messages

Once a message is sent to another radio, it is saved in the Sent folder. The most recent sent text message is always added to the top of the Sent list.

The Sent folder is capable of storing a maximum of ten (10) last sent messages. When the folder is full, the oldest text message in the folder is deleted when the 11th message comes in.

## Viewing a Sent Text Message





The icon at the top right corner of the screen indicates the status of the message. **Text Messaging Service (TMS)** on page 57 for more information.

### Procedure:



Press the preprogrammed **Data Feature** button or the **TMS Feature** button to access the TMS feature screen, and proceed to Step 3.

### OR

Follow the procedure below.

- 1  or  to **TMS**.
- 2 Press the **Menu Select** button directly below **TMS** to access the TMS feature screen.
- 3  or  to **SENT** and press the **Menu Select** button below **SEL**.

4 The display shows alias or ID, with the recipient of latest sent message on top.

5  or  to the required alias or ID and press the **Menu Select** button below **SEL** to view the message.

Press the **Menu Select** button directly below **OPTN**, **DEL**, or **BACK** to access the option.

- Select **OPTN** to send to the message.
- Select **DEL** to delete the message.
- Select **BACK** to return to the previous screen.

## Sending a Sent Text Message

### Procedure:

- 1 Press the **Menu Select** button directly below **OPTN** while viewing the message.

---

- 2 **▶** or **◀** to **SEND MESSAGE** and press the **Menu Select** button directly below **SEL** to send the message.

---

- 3 **▶** or **◀** to scroll through the address list and highlight the required address.  
**OR**  
**▶** or **◀** to **[OTHER RECPNT]** and press the Menu Select button below **EDIT**.  
 A blinking cursor appears in the **ENTER ADDRESS** screen. Use the keypad to type the address entry.  
 Press the **Menu Select** button below **DEL** to delete any unwanted characters.  
 Press **(\*)** to add a space.  
 Press **(0)** to toggle between mixed case mode, uppercase mode, and lowercase mode.  
 Press **(#)** to toggle between numeric and letter mode.

---

- 4 Press the **Menu Select** button below **SEND** or the **PTT** button to send the message.

---

- 5 The display shows the **SEND MESSAGE** screen and **SENDING MSG** on the display.

---

Press the **Menu Select** button directly below **BACK** at any time to return to the previous screen.

**Note:** You can append a priority message and/or a request reply to your message. **Using the Priority Status and Request Reply Features** on page 61 for more details.

## Deleting a Text Message

### Procedure:

From the Inbox, Draft, or Sent screen:

- 1 **▶** or **◀** to scroll through the messages.

---

- 2 Press the **Menu Select** button directly below **DEL** to delete the current message  
**OR**  
 Press the **Menu Select** button directly below **CLR** to delete all messages.

---

## ■ Secure Operation

---

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

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

### Selecting Secure Transmissions

#### **Procedure:**

Turn the preprogrammed Secure/Clear switch to the secure position.

**Note:** If the selected channel is preprogrammed for clear-only operation – when you press the **PTT** button, an invalid mode tone sounds and the display shows **CLEAR TX** only.

The radio will not transmit until you set the **SECURE/CLEAR** switch to the clear position.

### Selecting Clear Transmissions

#### **Procedure:**

Turn the preprogrammed **Secure/Clear** switch to the clear position.

**Note:** If the selected channel is preprogrammed for secure-only operation – when you press the **PTT** button, an invalid mode tone sounds and the display shows **SECURE TX ONLY**.

The radio will not transmit until you set the **Secure/Clear** switch to the secure position.

## Managing Encryption

### Loading an Encryption Key

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

#### **Procedure:**

- 1 Attach the KVL to your radio.
  - 2 The display shows **KEYLOADING**, and all other radio functions, except for power down, backlight, and volume, are locked out.
-



- 3 Select the required keys and press the **Menu Select** button directly below **LOAD** on the KVL. This loads the encryption keys into your radio.
- 
- 4 When the key has been loaded successfully, the radio sounds a short tone for single-key radios.  
**OR**  
When the key has been loaded successfully, the radio sounds an alternating tone for multikey radios.
- 

### **Using the Multikey Feature**


This feature allows the radio to be equipped with as many as 48 different encryption keys and supports the DES-OFB algorithm.

There are two types:

- **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 keysets, 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 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, such as dynamic regrouping, failsoft, or emergency talkgroup. You can have operator-selectable key erasure.

### **Selecting an Encryption Key**

#### **Procedure:**

- 1 **◀** or **▶** to **KEY**.
- 
- 2 Press the **Menu Select** button directly below **KEY**. The display shows the last user-selected and stored encryption key, and the available menu selections.
- 
- 3 **◀** or **▶** to scroll through the encryption keys.  
**OR**  
Use the keypad to enter the number of the desired key.
- 
- 4 Press the **Menu Select** button directly below **SEL** to save the newly selected key and return to the Home screen.  
**OR**  
Press , the **PTT** button, or the **Menu Select** button directly below **EXIT** to exit.
- 


- Note:** If the selected key is erased, a momentary keyfail tone sounds and the display shows **KEY FAIL**.  
**OR**  
If the selected key is not allowed, a momentary illegal key tone sounds and the display shows **ILLEGAL KEY**.

## **Selecting a Keypad**



This 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 keypad, and another group of three different keys structured to another keypad; by changing keypads, you would automatically switch from one set of keys to the other.

Every channel to which one of the original keys was tied now has the equivalent new key instead.

**Note:** Press , the **PTT** button, or the **EXIT** menu selection to exit this menu at any time without changing the keypad selection.



### **Procedure:**

- 1  or  to **KSET**.

---

- 2 Press the **Menu Select** button directly below **KSET**. The display shows the last user-selected and stored keypad, and the available keypad menu selections.

---

- 3  or  to scroll through the keypads.  
**OR**  
Use the keypad to enter the number of the desired keypad.

---

- 4 Press the **Menu Select** button directly below **SEL** to save the newly selected keypad.

---



- 5 The radio exits keypad selection and returns to the Home screen.

---

## **Using the Key Zeroization Feature**

This feature allows you to erase all or selected encryption keys.



### **Procedure:**

- 1  or  to **ERAS**.

---

- 2 Press the **Menu Select** button directly below **ERAS**. The display shows the last user-selected and stored encryption key, and the available menu selections.

---

- 3  or  to the desired encryption key.  
**OR**  
Use the keypad to enter the number of the desired key.

---




- 4 Press the **Menu Select** button directly below **ALL** to delete all keys.  
**OR**  
Press the **Menu Select** button directly below **SNGL** to current shown key.  
**OR**  
Press the **Menu Select** button directly below **ABRT** to abort this screen and return to Home screen.

---

## Requesting an Over-the-Air Rekey (ASTRO Conventional Only)

This feature, also known as **OTAR**, allows the dispatcher to reprogram the encryption keys in the radio remotely. The dispatcher performs the rekey operation upon receiving a rekey request from the user.

### Procedure:

- 1  or  to **REKY**.
- 2 Press the **Menu Select** button directly below **REKY**.
- 3 Press the **PTT** button to send the rekey request.  
**OR**  
Press the **PTT** button again, or the  or **Emergency** button, to exit the feature and transmit in normal mode.
- 4 If the rekey operation fails, a bad-key tone sounds and the display shows **REKEY FAIL**.

**Note:** The rekey operation failure indicates that your radio does not contain the Unique Shadow Key (USK). This key must be loaded into the radio with the key-variable loader (KVL) before the rekey request can be sent.

Refer to your local key management supervisor for more information.

## Global Positioning System (GPS) Enabled

Your GPS Enabled feature uses information from the Global Positioning System (GPS) satellites orbiting the Earth to determine the approximate geographical location of your radio, expressed as latitude and longitude. The availability and accuracy of this location information (and the amount of time that it takes to calculate it) varies depending on the environment in which you are using the GPS feature.

For example, GPS location fixes are very difficult to obtain indoors, in covered locations, between high buildings, or in situations where you have not established a clear broad view of the sky.

### Understanding the GPS Feature

The GPS technology uses radio signals from earth orbiting satellites, to establish the location co-ordinates, maximizing your view of clear unobstructed sky is essential for optimum performance.

Where adequate signals from multiple satellites are not available (usually because you cannot establish a view of a wide area of the sky), the GPS feature of your radio will not work. Such situations include but are not limited to:

- In underground locations
- Inside of buildings, trains, or other covered vehicles

- Under any other metal or concrete roof or structure
- Between tall buildings or under dense tree-cover
- In temperature extremes outside the operating limits of your radio

Even where location information can be calculated in such situations, it may take longer to do so, and your location estimate may not be as accurate. Therefore, in any emergency situation, always report your location to your dispatcher.

**Note:** Even where adequate signals from multiple satellites are available, your GPS feature only provides an approximate location, usually within meters from your actual location, but sometimes further away.

Keep in mind that the accuracy of the location information and the time it takes to obtain it varies depending upon circumstances, particularly the ability to receive signals from an adequate number of satellites.

**Note:** The satellites used by the GPS feature are controlled by the U.S. government and are subject to changes implemented in accordance with the Department of Defense GPS user policy and the Federal Radio Navigation Plan. These changes may affect the performance of the GPS feature on your radio.

## Enhancing GPS Performance

Sometimes, the GPS feature may be unable to complete a location calculation successfully. You then see a message indicating that your radio cannot connect to enough visible satellites.

To maximize the ability of your radio to determine a fix, please note the following guidelines:

- For your initial fix, hold the radio in the face position.
- Stay in the open. The GPS feature works best where there is nothing between your radio and a large amount of open sky.

## The Outdoor Location Feature (Using GPS)

This feature allows you to determine your current location using a location menu, as well as your current distance and bearing in relation to another location. Radio location may be requested and reported over-the-air.

This feature is only available when a location enabled accessory such as the GPS Antenna is used.

Your radio stores up to a maximum of sixty (60) programmable location coordinates, also known as waypoints. When the memory is full, the next waypoints automatically replaces the oldest waypoints in the radio.

The radio also stores four (4) preprogrammed waypoints. These coordinates cannot be deleted.

Programmable Waypoints	Preprogrammed Waypoints
User-configurable location coordinates.	Fixed location coordinates: <ul style="list-style-type: none"> <li>• Home</li> <li>• Emergency</li> <li>• Last Known Location</li> <li>• Destination</li> </ul>
Only the alias is editable, not the coordinates.	The Home and Destination coordinates are editable.
Coordinates can be deleted one at a time, or all at once.	Coordinates cannot be deleted.

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

### *Accessing the Outdoor Location Feature*



**Note:** An **ON** menu key may be present on the location menu if it is preprogrammed by the dealer or system administrator.

### Procedure:

Press the preprogrammed **GPS** button to toggle the Outdoor Location feature on or off.

### OR



Follow the procedure below to turn on the GPS:

- 1  or  to **LOC**.

---

- 2 Press the **Menu Select** button directly below **LOC**. The display shows **LOCATION OFF <LATITUDE>**.

---

- 3  or  to check the longitude, time and date of the last successful location fix if you want.

---

- 4 Press the **Menu Select** button directly below **ON** to turn on the GPS. The display shows **PREVIOUS LOC <LATITUDE>**.

---

- 5 Press the **Menu Select** button directly below **RFSH** to obtain a new location fix.

---

- 6 The top line temporarily displays **PLEASE WAIT** while the new location is being determined. While the new location is being determined, the location signal can be a solid or blinking icon.


---

- 7 Once the location coordinates are fixed, the display shows the current latitude. Toggle to see the longitude, time and date.  
The location coordinates are updated automatically every four minutes while the location signal is present.

---






- 8 Press the **Menu Select** button directly below **EXIT** to exit the feature and return to the main screen.

**OR**

Press  or the **PTT** button (if preprogrammed) to exit this menu.

**OR**

Follow the procedure below to turn off the GPS:









- 1  or  to **LOC**.
  - 2 Press the **Menu Select** button directly below **LOC**. The display shows **PREVIOUS LOC <LATITUDE>**.
  - 3  or  to check the longitude, time and date of the last successful location fix.
  - 4 Press the **Menu Select** button directly below **OPTN** to turn off the GPS.
  - 5 Press the **Menu Select** button directly below **EXIT** to exit the feature and return to the main screen.
- OR**
- Press  or the **PTT** button (if preprogrammed) to exit this menu.

*The radio also exits the menu if the emergency button is pressed.*

### Saving a Waypoint

### Procedure:

While in the current location display:

- 1 Press the **Menu Select** button directly below **OPTN**.
  - 2  or  to **SAVE AS WAYPNT** and press the **Menu Select** button directly below **SEL**.
  - 3 A blinking cursor appears in the Save as waypoint screen. Use the keypad to type the alias via multi-tap. Press  to move one space to the left. Press  to move one space to the right. Press the **Menu Select** button below **DEL** to delete any unwanted characters. Press  to add a space. Press  to toggle between mixed case mode, uppercase mode, and lowercase mode. Press  to toggle between numeric and letter mode.
  - 4 Press the **Menu Select** button directly below **OK** once you are done.
  - 5 You **CURRENT LOC SAVED AS <WAYPOINT NAME>** on the display.
  - 6 Press the **Menu Select** button directly below **EXIT** to exit the feature and return to the main screen.
- OR**
- Press  or the **PTT** button (if preprogrammed) to exit this menu.

## Viewing a Saved Waypoint

### Procedure:

While in the current location display:

- 1 Press the **Menu Select** button directly below **OPTN**.

---

- 2 **◀** or **▶** to **WAYPOINTS**.

---

- 3 Press the **Menu Select** button directly below **SEL**. The display shows Waypoints name.

---

- 4 **◀** or **▶** to desired waypoints name.

---

- 5 Press the **Menu Select** button directly below **OPTN**.

---

- 6 **▶** to **VIEW**.

---

- 7 Press the **Menu Select** button directly below **SEL**.

---

- 8 **▶** again to view UTC and date the waypoint was detected.

---

- 9 Press the **Menu Select** button directly below **BACK** to return to previous Waypoint screen.  
**OR**  
 Press the **Menu Select** button directly below **OK** to return to Location screen.  
**OR**  
 Press **🏠** to return to Home screen.  
**OR**  
 Press **PTT** button to return to Home screen.

---

## Editing the Alias of a Waypoint

### Procedure:

While in the current location display:

- 1 Press the **Menu Select** button directly below **OPTN**. The display shows Options screen.

---

- 2 **◀** or **▶** to **WAYPOINTS**.

---

- 3 Press the **Menu Select** button directly below **SEL**. The display shows Waypoints screen.

---

- 4 **▶** or **◀** to desired waypoints.

---

- 5 Press the **Menu Select** button directly below **OPTN**.

---

- 6 **▶** or **◀** to **EDIT NAME**.

---

- 7 Press the **Menu Select** button directly below **SEL**. The display shows Edit Name screen.

---

- 8 A blinking cursor appears in the Save as waypnt screen. Use the keypad to type the alias via multi-tap.  
 Press **◀** to move one space to the left.  
 Press **▶** to move one space to the right.  
 Press the **Menu Select** button below **DEL** to delete any unwanted characters.  
 Press **(\*)** to add a space.  
 Press **(0)** to toggle between mixed case mode, uppercase

mode, and lowercase mode.

Press **#** to toggle between numeric and letter mode.

- 9 Press the **Menu Select** button directly below **OK** once you are done.
- 10 The display shows **<WAYPOINT NAME> UPDATED**.
- 11 Press the **Menu Select** button directly below **EXIT** to exit the feature and return to the main screen.  
**OR**  
Press **⏏** or the **PTT** button (if preprogrammed) to exit this menu.

### *Editing the Coordinates of a Waypoint*

#### **Procedure:**

#### **Procedure:**

While in the current location display:

- 1 Press the **Menu Select** button directly below **OPTN**. The display shows Options screen.
- 2 **⏏** or **▶** to **WAYPOINTS** and press the **Menu Select** button directly below **SEL**. The display shows Waypoints screen.
- 3 **▶** or **⏏** to desired waypoints.

- 4 Press the **Menu Select** button directly below **OPTN**.
- 5 **▶** or **⏏** to **EDIT Location**.
- 6 Press the **Menu Select** button directly below **SEL**. The display shows Edit Name screen.
- 7 A blinking cursor appears in the Save as waypoint screen. Use the keypad to type the number.  
Press **⏏** to move to the next number/coordinates.  
Press **▶** to move back to the previous number/chordates.  
Press the **Menu Select** button below **DEL** to delete any unwanted characters.
- 8 Press the **Menu Select** button directly below **OK** once you are done.
- 9 The display shows **<WAYPOINT NAME> UPDATED**.
- 10 Press the **Menu Select** button directly below **EXIT** to exit the feature and return to the main screen.  
**OR**  
Press **⏏** or the **PTT** button (if preprogrammed) to exit this menu.

### *Deleting a Single Saved Waypoint*

#### **Procedure:**

- 1 **▶** or **⏏** to **LOC**.



- 2 Press the **Menu Select** button directly below **LOC**.
- 3 Press the **Menu Select** button directly below **OPTN**. The display shows Options screen.
- 4 **▶** or **◀** to **WAYPOINTS**.
- 5 Press the **Menu Select** button directly below **SEL**. The display shows Waypoints screen.
- 6 **▶** or **◀** to desired waypoints.
- 7 Press the **Menu Select** button directly below **OPTN**.  
**OR**  
Press the **Menu Select** button directly below **DEL** and then skip to step 9.
- 8 **▶** or **◀** to **DELETE**. The display shows **<WAYPOINT NAME> CONFIRM DEL?**.
- 9 Press the **Menu Select** button directly below **YES** to delete.
- 10 The display shows **<WAYPOINT NAME>DELETED**.

### *Deleting All Saved Waypoint*

#### **Procedure:**

- 1 **▶** or **◀** to **LOC**.
- 2 Press the **Menu Select** button directly below **LOC**.

- 3 Press the **Menu Select** button directly below **OPTN**. The display shows Options screen.
- 4 **▶** or **◀** to **WAYPOINTS**.
- 5 Press the **Menu Select** button directly below **SEL**. The display shows Waypoints screen.
- 6 **▶** or **◀** to desired waypoints.
- 7 Press the **Menu Select** button directly below **OPTN**.
- 8 **▶** or **◀** to **DELETE ALL**. The display shows **ALL SAVED WAYP CONFIRM DEL?**.
- 9 Press the **Menu Select** button directly below **YES** to delete.
- 10 The display shows **ALL SAVED WAYP DELETED**.

### *Measuring the Distance and Bearing from a Saved Waypoint*

#### **Procedure:**

While in the current location display:

- 1 Press the **Menu Select** button directly below **OPTN**.
- 2 **▶** or **◀** to **DIST FRM HERE** and press the **Menu Select** button directly below **SEL**.
- 3 The display shows a waypoints.

- 4 ▶ or ◀ to the required waypoint, and press the **Menu Select** button directly below **SEL**.
- 5 The display shows the distance and bearing from the current to the selected coordinates.

### **Using the Location Feature While in Emergency Mode**

When the Emergency feature is activated by pressing the emergency button, the radio exits the Location menu and returns to the home (default) display so that you can which channel the emergency signal is going out on.

However, you may re-enter the Location menu while still in emergency mode, provided that Silent Emergency has not been activated.

If you have turned Location off using the **ON/OFF** menu key, it automatically turns back on when Emergency is activated.

If there is a solid location signal during Emergency, the current location and the location information received is saved as Emergency and Last Known Location waypoints, respectively.

## ■ **Trunking System Controls**

---

### **Using the Failsoft System**

The failsoft system ensures continuous radio communications during a trunked system failure. If a trunking system fails completely, the radio goes into failsoft operation and automatically switches to its failsoft channel.

The failsoft condition is indicated by a faint beeping tone every nine seconds (radio unsquelched) until the trunking system returns to normal operation.

To continue, in Failsoft, to communicate with other talkgroups, refer to the following procedure.

#### **Procedure:**

- 1 Rotate the **Channel** knob to change to a different repeater frequency.
- 2 Press the **PTT** button to talk, and release the button to listen.

*When the trunking system returns to normal operation, your radio automatically leaves failsoft operation and returns to trunked operation.*

## Going Out-of-Range

**OUT OF RANGE** when your radio goes out of the range of the system, it can no longer lock onto a control channel.

### Procedure:

- 1 A low-pitched tone sounds.

#### **AND/OR**

The display shows the currently selected zone/channel combination and **OUT OF RANGE**.

---

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

#### **OR**

It locks onto a failsoft channel.

#### **OR**

It is turned off.

---

## SmartZone®

The SmartZone® feature extends communications beyond the reach of a single-trunked site (antenna location) when operating in a SmartZone system. SmartZone units provide expanded wide-area coverage.

SmartZone automatically switches the radio to a different site when the current site signal becomes unacceptable. This usually happens when the vehicle in which the radio is located is driven out of the range of one site, and into the range of another.

Under normal conditions, a SmartZone-enabled radio functions invisibly to the operator. However, the operator does have some manual controls on the Control Head – the **RSSI** menu entry. This button can be used to check, or change, the SmartZone operation.

## Using Site Trunking Feature

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

The display shows the currently selected zone/channel combination and **SITE TRUNKING**.

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

## Locking and Unlocking a Site

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.

### Procedure:

Use the preprogrammed **Site Lock/Unlock** button to toggle the lock state between locked and unlocked.

### OR

Follow the procedure below.

- 1  or  to **SITE**.
- 2 Press the **Menu Select** button directly below **SITE**.
- 3 Press the **Menu Select** button directly below **LOCK** to lock the site. The display shows **SITE LOCKED**.

### OR

Press the **Menu Select** button directly below **UNLK** to unlock the site. The display shows **SITE UNLOCKED**.

- 4 The radio saves the new site lock state and returns to the Home screen.

## Viewing and Changing a Site

This feature allows you to view the number of the current site or force your radio to change to a new one.

## Viewing the Current Site

### Procedure:

- 1 Press the preprogrammed **Site Search** button.
- 2 The display momentarily shows the name of the current site and its corresponding received signal strength indicator (RSSI).

## Changing the Current Site

### Procedure:

- 1 Press and hold down the preprogrammed **Site Search** button.
- 2 A tone sounds and the display momentarily shows **SCANNING SITE**.

When the radio finds a new site, it returns to the Home screen.

## Trunked Announcement

The announcement capability allows you to make announcements to the entire user group, as well as monitor talkgroup calls and other announcements.

Announcement calls are handled in two different ways, depending on the trunked central controller configuration. The two types are called *ruthless* and *non-ruthless* preemption.

- **Ruthless Preemption:**

When a ruthless preemption announcement call is initiated, the requesting radio begins transmitting immediately. All associated talkgroup calls taking place on other channels are immediately halted, and the radios are steered to the announcement call.

Transmitting radios continue to transmit until the **PTT** button is released, at which time they also unmute for the announcement call. Individual calls (Private Conversation and telephone interconnect) are not affected.

- **Non-Ruthless Preemption:**

When a non-ruthless preemption announcement is initiated, the initiating unit receives a telephone-type busy tone, followed by a call back when all associated talkgroup conversations end.

Once an announcement call is pending, any attempts by other users to initiate a talkgroup call will result in a telephone-type busy tone. These users will not receive a call back until the announcement call is complete.

### **Initiating an Announcement**

If your radio has been programmed to allow announcement calls:

**Procedure:**

- 1 Press the **Channel** knob to locate the announcement-group mode.
- 

- 2 Press the microphone **PTT** button to initiate the announcement.
- 

## **Utilities**

---





### **Viewing Recent Calls List**

This feature allows you to view the recent incoming and outgoing call information of the following call types:

- Call Alert
- Selective Call
- Private Call
- Phone Call (Outgoing only)


The radio can also be preprogrammed to log only the radio IDs associated with incoming Dispatch Calls. check with your dealer or system administrator for more information.

**Procedure:**

- 1  or  to **RCNT**.
  - 2 Press the **Menu Select** button directly below **RCNT** to access the **Recent Calls** feature screen.
  - 3  or  to scroll through the list.
-

- 4 Press the **Menu Select** button directly below **BACK** to return to Home screen.

**OR**

Press  or the **PTT** button to return to the Home screen.

---

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

### **Selecting the Power Level**

You can select the power level at which your radio transmits. The radio always turns on to the default setting.

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

#### **Settings:**

- Select **LOW** for a shorter transmitting distance and to conserve power.
- Select **HIGH** for a longer transmitting distance.

#### **Procedure:**

Use the preprogrammed **Transmit Power Level Switch** to toggle transmit power level between high and low power.

**OR**

Follow the procedure below.

- 1  or  to **PWR**.
- 

- 2 Press the **Menu Select** button directly below **PWR**.
- 

- 3 The display shows **LOW POWER** and the low power icon.

**OR**

The display shows **HIGH POWER** and the high power icon.

---

### **Selecting a Radio Profile**

This feature allows you to manually switch the visual and audio settings of the radio. The display, backlight, alert tones, and audio settings are defined according to the preprogrammed radio settings of each radio profile.

You can have up to a maximum of twelve (12) radio profiles programmed into your radio by a qualified radio technician.

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

#### **Procedure:**



Use the preprogrammed **Profile** button and proceed to Step 3.

**OR**

Follow the procedure below.

- 1  or  to **PRFL**.
- 

- 2 Press the **Menu Select** button directly below **PRFL** to access the **Profiles** feature screen.
- 

- 3  or  to scroll through the menu selections.
-

- 4 Press the **Menu Select** button directly below **SEL** to select the required radio profile.

**OR**

Press the **Menu Select** button directly below **EXIT** to exit the screen without making any changes.

- 5 The radio returns to the Home screen. The profile name on the Home screen indicates the current selected radio profile.

### Enabling and Disabling the Radio Alias

This feature allows you to display or hide the radio alias (name).

#### **Procedure:**

- 1 Press the **Menu Select** button directly below **MYID**.
- 2 The display momentarily shows **RADIO ID OFF**, and the radio alias disappears from the Home screen.  
**OR**  
The display momentarily shows **RADIO ID ON**, and the radio alias appears on the Home screen.

### Controlling the Display Backlight

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

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

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

#### **Procedure:**

Press the  button to toggle the backlight off or on.

**OR**

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

### Turning Keypad Tones On or Off



You can enable and disable keypad tones if needed.

#### **Procedure:**

Press the preprogrammed **Keypad Mute** button to turn the tones off or on.

**OR**

Follow the procedure below.

- 1  or  to **MUTE**.
- 2 Press the Menu Select button directly below **MUTE**.
- 3 The display momentarily shows **TONES OFF**, indicating that the keypad tones are disabled.  
**OR**  
The display momentarily shows **TONES ON**, and a short tone sounds, indicating that the keypad tones are enabled.

## Turning Voice Mute On or Off



You can enable and disable voice transmission, if needed.

### Procedure:

Press the preprogrammed Voice Mute button to turn the feature off or on.

### OR

Follow the procedure below.

- 1  or  to **VMUT**.

---

  - 2 Press the **Menu Select** button directly below **VMUT**.

---

  - 3 The display momentarily shows **VOICE MUTE OFF**, and a short tone sounds, indicating that the feature is disabled.
- OR**
- The display momentarily shows **VOICE MUTE ON**, and a short tone sounds, indicating that the feature is enabled.
- 

## Using the Time-Out Timer

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

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

The timer is defaulted at 60 seconds, but it can be preprogrammed from 3 to 120 seconds, in 15-second intervals, or it can be disabled entirely for each radio mode, by a qualified radio technician.

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

### Procedure:

- 1 Hold down the **PTT** button longer than the preprogrammed time. You hear a short, low-pitched warning tone, the transmission is cut-off, and the LEDs goes out until you release the **PTT** button.

---

  - 2 Release the **PTT** button. The LEDs relight and the timer resets.

---

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




## Using the Conventional Squelch Operation Features

This feature filters out unwanted calls with low signal strength or channels that have a higher than normal background noise.

### 1 Procedure:

▶ or ◀ to **SQL**.

2 Press the **Menu Select** button directly below **SQL**. The display shows **SQUELCH XX**, where **XX** is a squelch level setting of 0 to 15.

3 Press  to return to the selected channel.

## Analog Options

Tone Private Line (PL), Digital Private-Line (DPL), and carrier squelch can be available (preprogrammed) per channel.

Option	Result
Carrier squelch (C)	You hear all traffic on a channel.
PL or DPL	The radio responds only to your messages.

## Digital Options

One or more of the following options may be preprogrammed in your radio. Consult your dealer or system administrator for more information.

Option	Result
Digital Carrier-Operated Squelch (COS)	You hear any digital traffic.
Normal Squelch	You hear any digital traffic having the correct network access code.
Selective Switch	You hear any digital traffic having the correct network access code and correct talkgroup.

## Using the PL Defeat Feature

This feature allows you to override any coded squelch (DPL or PL) that might be preprogrammed to a channel. The radio will also unmute to any digital activity on a digital channel.

### Procedure:

Place the preprogrammed **PL Defeat** switch in the PL Defeat position. You hear any activity on the channel.

### OR

The radio is muted if no activity is present.

**Note:** When this feature is active, the Carrier Squelch status indicator is displayed.

## Using the Digital PTT ID Feature

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

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

## Using the Smart PTT Feature (Conventional Only)

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

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

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

Three variations of smart PTT are available:

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

## Accessing General Radio Information

Your radio contains information on the following:

- Radio Information


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

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

### *Accessing Radio Information*



This feature displays the following information of your radio:

- Host Version
- Model Number
- Serial Number
- ESN
- Flash Code
- Flash Size
- CH Version
- KG (Secure Algorithm)
- Memory Size
- Tuning Version
- Processor Version
- RF Band
- Secure Version
- DSP Version

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

#### **Procedure:**

- 1  or  to **INFO**.
- 2 Press the **Menu Select** button directly below **INFO**.

- 3  or  to **RADIO INFO** and press the **Menu Select** button directly below **SEL**.


- 4 The display shows the Information screen.

- 5  or  to scroll through the various information.

**OR**

Press the **Menu Select** button directly below **BACK** to return to previous screen.

**OR**

Press  to exit and return to the home display.

### *Viewing IP Information*

This feature displays the device name, IP address, and status of your radio.

**Note:** The device name of your radio is preprogrammed. Check with your dealer or system administrator for more information.

#### **Procedure:**

Press the preprogrammed Info button and proceed to Step 3.

**OR**

Follow the procedure below.

- 1  or  to **INFO**.
- 2 Press the **Menu Select** button directly below **INFO**.

3 ▶ or ◀ to **IP INFO** and press the **Menu Select** button directly below **SEL**.

---

4 The display shows the IP info screen.

---

5 ▶ or ◀ to scroll through the various information.

**OR**

Press the **Menu Select** button directly below **BACK** to return to previous screen.

**OR**

Press **⏠** to exit and return to the Home display.

---

### Viewing Control Assignments

This feature displays the programmable radio functions assigned to the controls of your radio for the currently selected channel.

**Programmable Features** on page 10 for more information on the various programmable features of your radio.

**Procedure:**

1 ▶ or ◀ to **INFO**.

---

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

---

3 The display shows the Control Map screen.

---

4 ▶ or ◀ to **CONTROL MAP**.

---

5 Press the **Menu Select** button directly below **SEL**.

---

6 You the Radio Info screen appears.

---

7 ▶ or ◀ to scroll through the various information.

**OR**

Press the **Menu Select** button directly below **BACK** to return to previous screen.

**OR**

Press **⏠** to exit and return to the Home display.

---

### Editing the Soft ID

This feature allows you to change your username.

**Note:** Your radio must be preprogrammed to allow you to use this feature.

**Procedure:**

Press the preprogrammed **Info** button and proceed to Step 3.

**OR**

Follow the procedure below.

1 ◀ or ▶ to **INFO**.

---

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

---

3 ▲ or ▼ to **SOFT ID** and press the **Menu Select** button directly below **SEL**.

---

4 The display shows the current Soft ID.

---

- 5 Press the **Menu Select** button directly below **EDIT** to edit the current Soft ID.

**OR**

Press the **Menu Select** button directly below **BACK** to return to the previous screen.

- 6 A blinking cursor appears in the **EDIT SOFT ID** screen. Use the keypad to edit the text.
- Press **←** to move one space to the left.
- Press **→** to move one space to the right.
- Press the **Menu Select** button below **DEL** to delete any unwanted characters.
- Press **(\*)** to add a space.
- Press **(0)** to toggle between mixed case mode, uppercase mode, and lowercase mode.
- Press **(#)** to toggle between numeric and letter mode.

- 7 Press the **Menu Select** button directly below **OK** to save the new Soft ID and return to the previous screen.

**OR**

Press the **Menu Select** button directly below **CNCL** to return to the previous screen.

### **Optional External Alarms (Horn and Lights)**

All control heads can be equipped for external alarms (horn and lights) that are activated when a Call Alert page, Private Conversation call, or phone call is received.

The radio always powers up with the horn and lights feature enabled.

**Note:** The horn and lights feature must be enabled by a qualified radio technician.

### **Non-Permanent Horn and Lights**

**Procedure:**

- 1 Press the **Menu Select** button directly below **H/L** momentarily. If necessary, use the **→** or **←** button to access other available options within the menu.

**OR**

Press the **Menu Select** button directly below **H/L** momentarily to access the available options. The last selected alarm(s) are enabled, and the display shows the enabled alarm(s), **until it is turned off**.

- 2 Press the **Menu Select** button directly below **H/L** a second time to turn off the alarm(s).

### **Permanent Horn and Lights**

**Procedure:**

- 1 Press the **Menu Select** button directly below **H/L** momentarily. The last selected alarm(s) are enabled. The display briefly shows the enabled alarms, and then **reverts back to the selected mode**.
- 2 Press the **Menu Select** button directly below **H/L** a second time to turn off the alarm(s).

## **Changing the Selected Alarms**

Press and hold the **Menu Select** button directly below **H/L** until a tone sounds and the display indicates the currently selected alarm.

Press the appropriate **Menu Select** button right below the menu entry to review the choices until the display shows the desired alarm:

- **H/L – HORN/LITES ON** (both horn and lights)
- **LGTS – LIGHTS ON**
- **HORN – HORN ON**

## **Receiving a Call While Alarms are Turned On**

When a call is received, the vehicle's horn sounds for four seconds, and/or the car lights turn on for 60 seconds. The time interval can be modified by a qualified radio technician.

The display will show the type of call received (**CALL**, **PAGE**, or **PHONE**) and the selected mode name.

## **Turning Off Non-Rearmable External Alarms**

### **Procedure:**

- 1** Press the **PTT** button or any control-head button to turn off the external alarm(s).
- 

- 2** To rearm the horn and lights feature, press the **Menu Select** button **H/L** momentarily.
- 

**Note:** Pressing the **Menu Select** button directly below **CALL**, **PAGE** or **PHON** will turn off the external alarm(s) and place you directly in that feature.

The **Volume** knob and the **Mode** knob have no effect on the state of the external alarm(s).

## **Turning Off Rearmable External Alarms**

To turn off the external alarm(s), press the **PTT** button or any control head button other than the **Menu Select** button directly below **H/L**.

**Note:** Pressing the **Menu Select** button directly below **CALL**, **PAGE** or **PHON** turns off the external alarm(s) and places you directly in that feature.

When the external alarm(s) are turned off, they will be automatically rearmed.

Pressing the **Menu Select** button directly below **H/L** turns off the external alarm(s) and exits the horn and lights feature. To rearm the feature, press the **Menu Select** button directly below **H/L** momentarily.

**Note:** **Note:**The Volume knob and the Mode knob have no effect on the state of the external alarms.

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## Helpful Tips

The following are suggestions to assist you in troubleshooting possible operating problems.



### Caution

The cables that connect to the rear of the radio could have live voltage on some of their pins. Do not remove or reconnect these cables. Only a qualified radio technician should perform this task. Service performed by unauthorized personnel may cause the radio to transmit an emergency alarm even if the unit is turned off.

If your radio is locked up or the display shows **FAIL 01/09**, turn the radio off and then back on. If this does not correct the condition, take the radio to a qualified radio technician for service.

If radio operation is intermittent, check with other persons using the system for similar problems before taking the radio in for service. Similar problems indicate a system malfunction rather than a radio failure.

If symptoms persist or, if your unit exhibits other problems, contact a qualified radio technician.





## Accessories

Your radio is compatible with the accessories listed in this chapter. Contact your dealer for details.

Antennas . . . . .	page 92
Audio . . . . .	page 93
Control Station . . . . .	page 93
Footswitches and PTTs . . . . .	page 94
Keypad . . . . .	page 94
Microphones . . . . .	page 95
Motorcycle . . . . .	page 95
Mounting Solution . . . . .	page 95
Power Cables . . . . .	page 96
Programming/Accessory Cables . . . . .	page 96
Siren . . . . .	page 97

## Antennas

- Ant roof top unity gain 800 (HAF4002\_)
- Ant 3dB low-profile 762-870 (HAF4013\_)
- Ant 3dB elevated feed 762-870 (HAF4014\_)
- Ant 1/4 wave 762-870MHz (HAF4016\_)
- Ant 3dB co-linear 762-870MHz (HAF4017\_)
- Ant, mobile, 800/900MHz (RRA4914\_)
- Ant 3dB mcycle 762-870MHz (HAF4015\_)
- Ant 3dB low profilemcyc 762-870MHz (HAF4018\_)
- Roof top, 1/4 wave 136-144MHz (HAD4006\_)
- Roof top, 1/4 wave 144-152 MHz (HAD4007\_)
- Roof top, 1/4 wave, 152-162 MHz (HAD4008\_)
- Roof top, 1/4 wave, 162-174 MHz (HAD4009\_)
- Ant 3dB, roof mt, 136-174 MHz (RAD4010AR\_)
- Ant roof mt wb VHF 136/162 (HAD4016\_)
- Ant roof mt wb VHF 146/174 (HAD4017\_)
- VHF ant wideband 136-174 MHz (HAD4021\_)
- GPS (HLN7005\_)

## ■ Audio

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7.5 Watt Speaker (water resistant) (HSN4038\_)

13 Watt Speaker (motorcycle) (HSN6003\_)

Standard speaker 8 Ohm (HSN4031\_)

Standard speaker 3.2 Ohm (HSN4032\_)

## ■ Control Station

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- Power supply 15A Hi power (HPN4007\_)
- Desk tray w/speaker (HLN6042\_)
- 110V Line cord (3060665A04)
- Euro cord (3060665A05)
- UK cord (3002120F02)
- Argentina cord (3085801L01)

## ■ Footswitches and PTTs

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- Emergency footswitch (HLN5113\_)
- PTT footswitch button (GLN7278\_)
- Emergency push button (HLN5131\_)
- Accessory PTT (RLN5926\_)
- External alarm cable (HKN4258\_)
- External alarm buzzer 110MA (HLN6953\_)
- External alarm relays (HLN6969\_)

## ■ Keypad

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- Auxiliary switch panel (HLN1224\_)
- Direct Entry Keypad (DEK) (HLN1392\_)
- DEK XTL cable adaptor (HKN6189\_)
- (DEK) Siren PA deck 8 button (H1336\_)
- (DEK) Status message deck 8 button (H1338\_)
- (DEK) Status message deck 16 button (H1339\_)
- DEK 8 button (HLN1362\_)
- DEK 24 button (HLN1363\_)
- DEK 16 button (HLN1364\_)

## ■ Microphones

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- Traditional Palm Microphone (HMN1090\_)
- Keypad Microphone (HMN4079\_)
- Smart Visor Microphone (RMN5054\_)
- GCAI Keypad Handset (HMN4097\_)
- GCAI non Keypad Handset (HMN4098\_)
- Desktop Microphone New-Design (RMN5070\_)
- Motorcycle Microphone (HMN1089\_)
- Microphone hang up clip (HLN9073\_)
- HLN9073B Hang up clip,0780257N01 (HLN5391\_)
- Motorcycle water resistant mic w/DB9 connector (HMN1079\_)
- HandSet/Hangup Armoured Cable w/GCAI connector (HKN1018\_)

## ■ Motorcycle

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- Motorcycle enclosure - black US (HLN1446\_)
- Motorcycle enclosure - white US (HLN1445\_)

## ■ Mounting Solution

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- Hi Power Quick Release w/ Lock ( )
- Mid power Key lock (HLN6372\_)
- Mid power Trunnion (HLN7002\_)

## ■ Power Cables

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- 10' Power Cable Dash Mount/Mid Power (HKN4191\_)
- 20' Power Cable Dash Mount (HKN4192\_)
- 100W power cable (HKN6110\_)
- 10' Power Cable Remote Mount (HKN6170\_)
- 17' Power Cable Remote Mount (HKN6169\_)
- 30' Power Cable Remote Mount (HKN6168\_)
- 50' Power Cable Remote Mount (HKN6167\_)
- 75' Power Cable Remote Mount (HKN6166\_)
- 115' Power Cable Remote Mount (HKN6165\_)
- 131' Power Cable Remote Mount (HKN6164\_)

## ■ Programming/Accessory Cables

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- J6 RS232 cable (HKN6122\_)
- Audio Cable Adapter (HKN6158\_)
- Audio Cable Data (HKN6159\_)
- Cable Kit 6' data (HKN6160\_)
- Cable Kit 20' data (HKN6161\_)
- Cable Access Data USB XTL5000 (HKN6163\_)
- USB cable (6ft) (HKN6163\_)
- USB cable (15ft) (HKN6172\_)
- Keyloader adaptor GCAI MMP/Hirose 1.5" cable (HKN6182\_)
- RS232 GCAI programming cable (HKN6183\_)
- USB GCAI-MMP programming cable (HKN6184\_)
- CH power, spkr, audio headset jacks (HKN6187\_)
- CH power and spkr (HKN6188\_)
- CH VIP connector (HKN6196\_)
- Ignition Sense Cable (3085378F01/HLN6863\_)
- Keyload cable KVL3000 plus to Hirose (TKN8531\_)
- 26pin connector for CHIB interface (HLN6961\_)
- O3 Can 17' extension cable (PMLN4958\_)

- O3 accessory cable (remote extender) V3-10331 (PMLN4959\_)
- GCAI microphone extension cable- Potato microphone (PMKN4033\_)
- Hirose RS232 programming cable V3-10349 (PMLN4957\_)
- Hirose Keyload cable V3-10184 (PMLN4956\_)
- Hirose to Hirose extension cable V3-10413 ( )

## ■ Siren

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- Siren (HLN1439\_)
- Siren switchbox (HLN6819\_)
- Siren cable (HKN6146\_)
- Siren PA round chrome skr (TDN6251\_)
- Siren PA Rectangular chrome (TDN6252\_)
- Siren PA underhood-grey (TDN6253\_)
- Siren PA round-grey (TDN6254\_)



## Appendix: Maritime Radio Use in the VHF Frequency Range

Take a moment to review the following:

Special Channel Assignments. . . . . page 98

Operating Frequency Requirements. . . . . page 99

### ■ Special Channel Assignments

#### 📄 Emergency Channel

If you are in imminent and grave danger at sea and require emergency assistance, use VHF Channel 16 to send a distress call to nearby vessels and the United States Coast Guard. Transmit the following information, in this order:

- 1 "MAYDAY, MAYDAY, MAYDAY."
- 2 "THIS IS \_\_\_\_\_, CALL SIGN \_\_\_\_\_."  
*State the name of the vessel in distress 3 times, followed by the call sign or other identification of the vessel, stated 3 times.*
- 3 Repeat "MAYDAY" and the name of the vessel.

- 4 "WE ARE LOCATED AT \_\_\_\_\_."  
*State the position of the vessel in distress, using any information that will help responders to locate you, e.g.:*
  - *latitude and longitude*
  - *bearing (state whether you are using true or magnetic north)*
  - *distance to a well-known landmark*
  - *vessel course, speed or destination*
- 5 State the nature of the distress.
- 6 Specify what kind of assistance you need.
- 7 State the number of persons on board and the number needing medical attention, if any.
- 8 Mention any other information that would be helpful to responders, such as type of vessel, vessel length and/or tonnage, hull color, etc.
- 9 "OVER."
- 10 Wait for a response.
- 11 If you do not receive an immediate response, remain by the radio and repeat the transmission at intervals until you receive a response. Be prepared to follow any instructions given to you.



## Non-Commercial Call Channel

For non-commercial transmissions, such as fishing reports, rendezvous arrangements, repair scheduling, or berthing information, use **VHF Channel 9**.

### Operating Frequency Requirements

A radio designated for shipboard use must comply with Federal Communications Commission Rule Part 80 as follows:

- on ships subject to Part II of Title III of the Communications Act, the radio must be capable of operating on the 156.800 MHz frequency
  - on ships subject to the Safety Convention, the radio must be capable of operating:
  - in the simplex mode on the ship station transmitting frequencies specified in the 156.025–157.425 MHz frequency band, and
    - in the semiduplex mode on the two frequency channels specified in the table below.

**Note:** Simplex channels 3, 21, 23, 61, 64, 81, 82, and 83 cannot be lawfully used by the general public in US waters.

Additional information about operating requirements in the Maritime Services can be obtained from the full text of FCC Rule Part 80 and from the US Coast Guard.

Channel Number	Frequency (MHz)	
	Transmit	Receive
8	156.400	–
9	156.450	156.450
10	156.500	156.500
11	156.550	156.550
12	156.600	156.600
13**	156.650	156.650
14	156.700	156.700
15**	156.750	156.750
16	156.800	156.800
17**	156.850	156.850
18	156.900	161.500
19	156.950	161.550
20	157.000	161.600
*	157.050	161.650
22	157.100	161.700
*	157.150	161.750

Channel Number	Frequency (MHz)	
	Transmit	Receive
24	157.200	157.200
25	157.250	161.850
26	157.300	161.900
27	157.350	161.950
28	157.400	162.000
60	156.025	160.625
*	156.075	160.675
62	156.125	160.725
63	156.175	160.775
*	156.225	160.825
65	156.275	160.875
66	156.325	160.925
67**	156.375	156.375
68	156.425	156.425
69	156.475	156.475
71	156.575	156.575
72	156.625	–

Channel Number	Frequency (MHz)	
	Transmit	Receive
73	156.675	156.675
74	156.725	156.725
75	***	***
76	***	***
77**	156.875	–
78	156.925	161.525
79	156.975	161.575
80	157.025	161.625
*	157.075	161.675
*	157.125	161.725
*	157.175	161.775
84	157.225	161.825
85	157.275	161.875
86	157.325	161.925
87	157.375	161.975
88	157.425	162.025

\* Simplex channels 3, 21, 23, 61, 64, 81, 82, and 83 cannot be **lawfully used** by the general public in US waters.

\*\* Low power (1 W) only

\*\*\* Guard band

**Note:** A – in the Receive column indicates that the channel is transmit only.

## Glossary

This glossary is a list of specialized terms used in this manual.

Term	Definition
ACK	Acknowledgment of communication.
Channel	A group of characteristics, such as transmit/receive frequency pairs, radio parameters, and encryption encoding.
Coded Squelch	Tone Private-Line™ or Digital Private-Line. Used on conventional channels to make sure you hear only the communication meant for you.
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.

Term	Definition
Conventional	Typically refers to radio-to-radio communications, sometimes through a repeater. You share a frequency, or frequencies, with other users without the aid of a central controller to assign communication channels. Therefore, you should monitor each channel before transmitting to avoid interfering with another user who may be transmitting.
Cursor	A visual tracking marker (a blinking line) that indicates a location on the display.
Digital Private-Line (DPL) Coded Squelch	A continuous, sub-audible data signal, transmitted with the carrier.
Dispatcher	An individual who has radio system management duties.
Failsoft	A back-up system allowing you to communicate in a non-trunked, conventional mode should the trunked system fail.
FCC	Federal Communications Commission.
Hang Up	Disconnect.
Home Display	The first display information after the radio completes its self test.
LCD	Liquid-Crystal Display.

Term	Definition
Mode	A programmed combination of operating parameters; for example, a channel or talkgroup.
Mode-Slaving	Radio programmed to automatically give the proper operation for a given mode you have selected.
Monitoring (Conventional Operation)	Press a programmed monitor button to listen to another user active on the channel. This way, you may be prevented from talking over someone else's conversation.
Page	A one-way alert, with audio and/or display messages.
Push-To-Talk (PTT) button	The PTT button engages the transmitter and puts the radio in transmit (send) operation when pressed. Press this button to transmit; release it to receive.
Repeater	A conventional radio feature, in which you talk through a receive/transmit facility (repeater) that re-transmits received signals in order to improve communications range and coverage.

Term	Definition
RF	Radio Frequency. A part of the general frequency spectrum between the audio and infrared light regions (about 10 kHz to 10,000,000 MHz).
RSSI	Received Signal Strength Indicator.
Squelch	The muting of audio circuits when received signal levels fall below a pre-determined threshold. With carrier squelch, you hear all channel activity which exceeds the radio's preset squelch level.
Standby	An operating condition whereby the radio's speaker is muted but still continues to receive data.
Talkgroup	An organization (or group) of radio users who communicate with each other, using the same communication path.
Tone Private-Line (PL) Coded Squelch	A continuous sub-audible tone transmitted with the carrier.

Term	Definition
Trunking	The automatic sharing of communications paths between a large number of users (Conventional). Allows radio users to share a smaller number of frequencies because a repeater, or communications path, is assigned to a talkgroup for the length of a conversation.
Zone	A grouping of channels or talkgroups.

# Commercial Warranty and Service

## 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:

APX 7500 O5 Control Head	Two (1) Years
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 (e.g., dealer or communication service provider), it can facilitate your obtaining warranty service. You can also call MOTOROLA at 1-800-927-2744 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, disassembles 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 the use of ancillary equipment or software not furnished by MOTOROLA which is attached to or used in connection with the Product. The foregoing states the entire liability of MOTOROLA with respect to infringement of patents by the Product or any parts thereof.

Laws in the United States and other countries preserve for MOTOROLA certain exclusive rights for copyrighted MOTOROLA software such as the exclusive rights to reproduce in copies and distribute copies of such MOTOROLA software. MOTOROLA software may be used in only the Product in which the software was originally embodied and such software in such Product may not be replaced, copied, distributed, modified in any way, or used to produce any derivative thereof. No other use including, without limitation, alteration, modification, reproduction, distribution, or reverse engineering of such MOTOROLA software or exercise of rights in such MOTOROLA software is permitted. No license is granted by implication, estoppel or otherwise under MOTOROLA patent rights or copyrights.

## VII. GOVERNING LAW:

This Warranty is governed by the laws of the State of Illinois, U.S.A.

## 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, 2204 Galvin Drive, Elgin, IL 60123, 1-800-227-6772.

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