

Selective Calls (ASTRO Conventional Only)

A Selective Call is intended to provide privacy and to eliminate the annoyance of having to listen to conversations that are of no interest to you. It is used to “set up” the call with the target unit, and to allow announcements type messages to an individual or group of units.

■ Quick Access (One-Touch)

If your radio is preprogrammed for Quick Access (One-Touch) Selective Call, you can make a call to *one* preprogrammed ID number without having to select the feature or an ID number.

- 1 Press the **Quick Access Selective Call** button to start the Selective Call.
- 2 When you are connected, you see the called ID. Press and hold the **PTT** button to talk; release the **PTT** to listen.
- 3 Press  to hang up and return to the home display.

■ Answer a Selective Call

- 1 When a Selective Call is received, you hear two alert tones, the call received symbol () flashes, and **Call Received** is displayed.
- 2 The display will remain active for two seconds, and then the speaker will unmute.
- 3 Press and hold the **PTT** button to talk; release it to listen.
- 4 Press  to hang up and return to the home display.

■ Initiate a Selective Call

- 1 Press  to find **Call**.
- 2 Press  directly below **Call**. You see the last transmitted or received ID number.

- 3 Go to “Select an ID Number”, below.

OR

Go to “Make a Selective Call” on page 45.

■ Select an ID Number

Use the Menu

- 1 Press  to find the ID number you want.

Note: Press **LNum** to go to the last number dialed.

- 2 Go to “Make a Selective Call” on page 45.

Use the Keypad

- 1 Use the keypad to enter the ID number you want.

Note: Press **LNum** to go to the last number dialed.

- 2 Go to “Make a Selective Call”, below.

■ Make a Selective Call

- 1 Press the **PTT** button to start the Selective Call.
- 2 When you are connected, you see the called ID. Press and hold the **PTT** button to talk; release the **PTT** to listen.
- 3 When your call is completed, press  to hang up. The radio returns to the home display.

Call Alert Paging

Call Alert 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 still send them a Call Alert page. You can also verify if a radio is active on the system.

In conventional operation, you can send either an individual Call Alert page or a group Call Alert page. ID numbers for individuals are preceded by **Id:** and for groups by **Gr:**.

■ Quick Access (One-Touch)

If your radio is preprogrammed for Quick Access (One-Touch) Call Alert Paging, you can send a page to *one* preprogrammed ID number without having to select the feature or an ID number.

- 1 Press the **Quick Access Call Alert** button to send the Call Alert. You see **Please Wait**.
- 2 When you are connected, you see the home display. Press and hold the **PTT** button to talk; release the **PTT** to listen.

OR

If an individual Call Alert page is not acknowledged, you see **No Acknowledge**.

If a group Call Alert page is not acknowledged, you do not see **No Acknowledge**. The radio will merely exit Call Alert and return to normal operation.

- 3 Press  or the **Call Response** button to hang up and return to the home display.

■ Answer a Call Alert Page

- 1 When a Call Alert page is received, you hear four repeating alert tones, the call received symbol () flashes, and **Page Received** is displayed.
- 2 Press and hold the **PTT** button to talk; release it to listen.

■ Initiate a Call Alert Page

- 1 Press  to find Page.
- 2 Press  directly below Page.

If an individual Call Alert page was last transmitted or received, you see the individual ID number.

If a group Call Alert page was last transmitted, you see blanks in the individual ID scratchpad and the group ID transmitted to in the group ID scratchpad (accessed by pressing  once).

If a group Call Alert page was last received, you see the ID of the sending radio in the individual ID scratchpad and the group ID transmitted to in the group ID scratchpad.

- 3 Go to “Select an ID Number” on page 47.

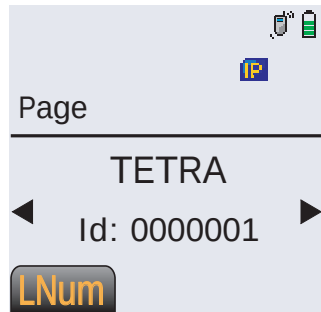
OR

Go to “Send a Call Alert Page” on page 48.

■ Select an ID Number

Use the Menu

- 1 Press  to find the ID number you want.



Note: Press *LNum* to go to the last number dialed.

- 2 Go to “Send a Call Alert Page”, below.

Use the Keypad

- 1 Use the keypad to enter the ID number you want.

Note: Press **LT** to go to the last number dialed.

- 2 Go to “Send a Call Alert Page”, below.

■ Send a Call Alert Page

- 1 Press the **PTT** button to send the Call Alert to the displayed number. You see `Please Wait`.
- 2 When you are connected, you see the home display. Press and hold the **PTT** button to talk; release the **PTT** to listen.

OR

If an individual Call Alert page is not acknowledged, you see `No Acknowledge`.

If a group Call Alert page is not acknowledged, you do not see `No Acknowledge`. The radio will merely exit Call Alert and return to normal operation.

- 3 Press  to hang up and return to the home display.

Conventional Talkgroup Calls (Conventional Operation Only)

Talkgroup Call lets you define a group of conventional system users so that they can share the use of a conventional channel.

Encryption keys are slaved to talkgroups. When talkgroups are enabled, encryption keys are changed by changing the active talkgroup. See “Secure Operations” on page 55.

■ Select a Talkgroup

- 1 Press  to find TGrp.
- 2 Press  directly below TGrp. You see the last talkgroup that was selected and stored, and Sel and Pset.



- 3 Press  or  to find the talkgroup you want.

OR

Use the keypad to enter the number of the corresponding talkgroup in the list.

- 4 Press  directly below Sel or Pset.

Sel (Select) — Saves the currently displayed talkgroup and returns to the home display.

Pset (Preset) — Selects the preset preprogrammed talkgroup.

If the encryption key slaved to the new talkgroup is erased, you see **Key fail** and hear a momentary key fail tone.

If the encryption key that is slaved to the new talkgroup is not allowed, you see **Illegal key** and hear a momentary key fail tone.

- 5 Press  or the **PTT** button to exit.

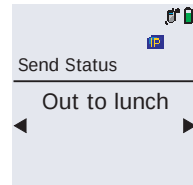
Status Calls (ASTRO 25 Trunking Only)

You can send data calls to the dispatcher about a predefined status. Each status can have up to a 14-character name. A maximum of sixteen status conditions is possible.

■ Send a Status Call

Use the Menu

- 1 Press  to find **Sts.**
- 2 Press  directly below **Sts.** The last acknowledged status call, or the first status in the list, is displayed.



- 3 Press  or  to find the status you wish to send.

OR

Use the keypad to enter a number corresponding to the location in the status list.

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

When the dispatcher acknowledges, four tones sound, **Ack Received** is displayed, and the radio returns to normal dispatch operation.

OR

If no acknowledgment is received, you will see **No Acknowledge** and hear a low-pitched tone.

- 5 Press  to go to the home display

Note: *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  or the **PTT** button is pressed.*

Use the Preprogrammed Status Button

- 1 Press the **Status** button. The last acknowledged status call, or the first status in the list, is displayed.
- 2 Press  or  to find the status you wish to send.

OR

Use the keypad to enter a number corresponding to the location in the status list.

- 3 Press the **PTT** button to send the status.

When the dispatcher acknowledges, four tones sound, Ack Received is displayed, and the radio returns to normal dispatch operation.

OR

If no acknowledgment is received, you will see No Acknowledge and hear a low-pitched tone.

- 4 Press  to go to the home display

Note: *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 the **PTT** button is pressed.*

Repeater or Direct Operation

Also known as “talkaround operation”, DIRECT lets you bypass the repeater and connect directly to another radio. The transmit and receive frequencies are the same.

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

■ Select Repeater or Direct Operation

Use the Menu

- 1 Press  to find **Dir**.
- 2 Press  directly below **Dir** to toggle between direct mode and repeater mode.
If **Dir** is selected, the Direct icon,  is shown on the display.

Use the Preprogrammed Direct Operation Button

Press the DIRECT operation button to turn on the feature. If **Dir** is selected, the Direct icon,  is shown on the display. Press the button again to return to REPEATER mode.

Note: *When the radio is in Repeater operation, REP is shown on the external display.*

Smart PTT (Conventional Only)

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

When smart PTT is enabled in your radio, you will not be able to transmit on an active channel. If you try to transmit on an active smart-PTT channel, you will hear an alert tone, and the transmission will be inhibited.

Two radio-wide variations of smart PTT are available:

Transmit Inhibit on Busy Channel with Carrier	You cannot transmit if any traffic is detected on the channel.
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.

Notes

Special Radio Features

Secure Operations

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.

Note: Secure operation is not available in trunked analog modes.

■ Select Secure Transmissions

Press the preprogrammed Secure button to turn on Secure mode. The Secure icon,  is shown on the display.

*Note: If the selected channel is programmed for clear-only operation — when you press the **PTT** button, you see CLR TX Only and you hear an invalid mode tone. Press the secure button again to change to Clear mode.*

■ Managing Encryption

■ Key Loading

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

- 1 Attach the KVL to your radio. When it is attached, the display will show Keyloading, and all other radio functions, except for power down, backlight, and volume, will be locked out.
- 2 Press the LOAD button on the KVL. This will load the encryption keys into your radio. When the key has been loaded successfully, the radio will sound a short tone for single-key radios; for multikey radios, an alternating tone will be heard.

■ Multikey

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

- **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 will have to strap your encryption keys for trunking on a per-talkgroup or announcement-group basis. In addition, you may strap a different key to other features, such as dynamic regrouping, failsoft, or emergency talkgroup. You can have operator-selectable key erasure.

■ Key Selection

- 1 Press  until **Key** appears on the display.
- 2 Press  directly below **Key**. The display changes to show the last user-selected and stored encryption key and the available menu selections.
- 3 Press  or  to scroll through the encryption keys.

OR

Enter the number of the desired key using the keypad.

Note: If an erased key is selected, Erased key will displayed.

- 4 Press  directly below the desired menu selection.

OR

If you selected the key via the keypad, press  or  to scroll through the menu selections:

Pset or **Preset** = selects the preset or default encryption key.

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

- 5 Press , the **PTT** button, the **Abt** menu selection to exit this menu.

Note: *If the selected key is erased, Key fail will be displayed and a momentary keyfail tone will be generated.
If the selected key is not allowed, Illegal key will be displayed and a momentary illegal key tone, similar to the key fail tone, will be generated.*

■ Keyset Selection

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 keyset, and another group of three different keys structured to another keyset; by changing keysets, you would automatically switch from one set of keys to the other. Every channel to which one of the original keys was tied will now have the equivalent new key instead.

- 1 Press  until **Kset** appears on the display.
- 2 Press  directly below **Kset**. The display changes to show the last user-selected and stored keyset and the available keyset menu selections.
- 3 Press  directly below the desired keyset.

OR

Enter the number of the desired keyset using the keypad.

- 4 To save the newly selected keyset, press the button directly below **Set**. The radio will then exit keyset selection and return to the home display.

Note: Press , the **PTT** button, the **Abt** menu selection to exit this menu at any time without changing the keyset selection.

■ Key Zeroization

This enables the user to erase all or selected encryption keys.

Use the Menu

- 1 Press  until the display shows **Eras**.
- 2 Press  directly below **Eras**. The display shows the last user-selected and stored encryption key, and the available menu selections:

All = erases all the encryption keys in the radio. The display shows **Ers All Keys** and **Yes** and **No**.

Sngl = selects the displayed encryption key to be erased. The display shows **Ers Sngl Key** and **Yes** and **No**.

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

*Note: Press , the **PTT** button, the **Abt** menu selection to exit this menu at any time without erasing any keys.*

- 3 Press  directly below the desired menu selection.

OR

Press  or  to find the desired encryption key. The display shows the selected key, and the available menu selections shown in step 2. Press  directly below the desired menu selection.

OR

Enter the location number of the desired key, using the keypad. The display shows the selected key, and the available menu selections shown in step 2. Press  directly below the desired menu selection.

- 4 Press , the **PTT** button, the **Abt** menu selection to exit this menu.

Use the Buttons

Note: *This is the method used for erasing the single key in radios with the single-key option, and for erasing all keys in radios with the multikey option.*

- 1 With the radio on, press and hold the **Top Right** button; while holding this button down, press the **Top Left** button.

Note: ***DO NOT** press the **Top Left** button before pressing the **Top Right** button, unless you are in an emergency situation; this would send an emergency alarm.*

- 2 Before the keys are erased, the display shows `Please wait`.
- 3 When all the encryption keys have been erased, the display shows `All keys erased`.

■ Over-the-Air Rekeying (Rekey Request) (ASTRO Conventional Only)

The over-the-air rekeying (OTAR) feature 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.

Use the Menu

- 1 Press  to find `Reky`.
- 2 Press  directly below `Reky`.
- 3 Press the PTT to send the rekey request.

Note: *Pressing the PTT again, or the Home or Emergency button, will exit the feature and allow the user to transmit in the normal manner.*

- 4 If the display shows `Rekey fail` and a bad-key tone sounds, the rekey operation has failed.

Note: *If this occurs, 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.*

Digital PTT ID

■ Receive

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

■ Transmit

Your radio's ID number is 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.

■ View Your Radio's ID Number

Use the Menu

- 1 Press  to find **Call** or **Page**.
- 2 Press  directly below **Call** or **Page**.
- 3 Press .

Use the Preprogrammed Call or Page Button

- 1 Press the **Call** or **Page** button.
- 2 Press .

Dynamic Regrouping (Trunking Only)

The dynamic regrouping feature lets the dispatcher 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, you will hear an invalid tone.*

When your radio is dynamically regrouped, it automatically switches to the dynamically regrouped channel. You see the dynamically regrouped channel's name, and hear a "gurgle" tone.

Press the **PTT** button to talk; release it 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.

■ Reprogram Request (ASTRO 25 Trunking Only)

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

Use the Menu

- 1 Press  to find Rpgm.
- 2 Press  directly below Rpgm.

The reprogram request is sent to the dispatcher.

3 If you hear *one beep*

- Press the **PTT** button to send the reprogram request again.

OR

- Press  to cancel and return to the home display.

OR

If you hear *five beeps*, the reprogram request was acknowledged by the dispatcher. Your radio returns to the home display.

OR

If the dispatcher does not acknowledge the reprogram request within six seconds, you see *No acknowledge* and hear a low-pitched alert tone.

Try again or press .

Use the Preprogrammed Reprogram Request Button

- 1 Press the **Reprogram Request** button. You see *Reprgrm Rqst.*

The reprogram request is sent to the dispatcher.

2 If you hear *one beep*

- Press the **PTT** button to send the reprogram request again

OR

- Press  to hang up and return to the home display.

OR

If you hear *five beeps*, the reprogram request was acknowledged by the dispatcher. Your radio returns to the home display.

OR

If the dispatcher does not acknowledge the reprogram request within six seconds, you see **No Acknowledge** and hear a low-pitched alert tone.

Try again or press .

■ **Select Enable / Disable**

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**.

Trunking System Controls

■ Failsoft

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.

During failsoft operation:

Your radio transmits and receives in conventional operation on a predetermined frequency.

You hear a medium-pitched tone every 10 seconds.

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

■ Out-of-Range

If you go out of the range of the system and can no longer lock onto a control channel:

You see the currently selected zone/channel combination and
Out of range.

AND/OR

You hear a low-pitched tone.

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.

■ Site Lock

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

■ Lock or Unlock a Site

Use the Menu

- 1 Press  to find Site.
- 2 Press  directly below Site. The current lock state is displayed.
- 3 Press  directly below the desired lock state, Lock or Unlk.
The new site lock state is saved and your radio returns to the home display.

Use the Preprogrammed Site Lock/Unlock Button

- 1 Press the **Site Lock/Unlock** button. The current lock state is momentarily displayed.
- 2 Press and hold the **Site Lock/Unlock** button to find the desired lock state, Site unlocked or Site locked.

■ Site Trunking

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

You see the currently selected zone/channel combination and Site Trunking.

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

■ Site View and Change

You can view the number of the current site or force your radio to change to a new one.

View the Current Site

Press the preprogrammed **Site Search** button.

The display momentarily shows the name of the current site and its corresponding received signal strength indicator (RSSI). (See Table 3 on page 5.)

OR

If the radio is scanning for a new site, you momentarily see `Scanning site`.

Change the Current Site

Press and hold down the preprogrammed **Site Search** button. You momentarily see `Scanning site` and hear a tone.

When the radio finds a new site, it returns to the home display.

ARS User Login and Text Messaging Features

Automatic Registration Service (ARS)

Automatic Registration Service 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).

Automatic Registration Service for the radio consists of 2 modes:

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

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

■ Selecting or Changing ARS Mode

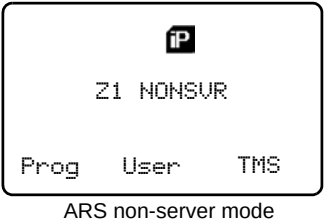
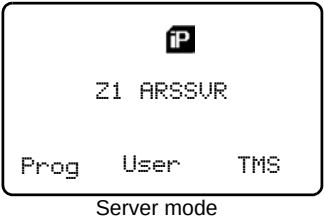
Consult a qualified radio technician for the right choice between the following methods:

- 1 Press  to find Chan.
- 2 Press  directly below Chan.

The display shows the current channel name (in this case, NONSUR) flashing and the zone (Z1), not flashing.



- 3 Press  to find the channel / mode you want.



Note: If the channel/mode you selected is unprogrammed, repeat step 3.



- 4 Press  to confirm the displayed zone and channel.

ARS User Login Feature

User login 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. User login feature only enables the recipient of your message to identify you as the sender by assigning a username to your message.

■ Accessing the User Login Feature

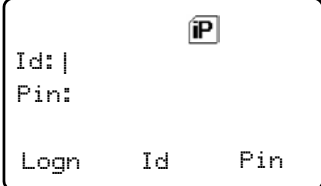
The user login feature can be accessed by selecting a menu item on the display or through a programmable button.

- 1 Press  until User appears on the display.

- 2 To access user login screen through the menu item, press  below User.

To access user login screen through a preprogrammed button, press on the preprogrammed user button.

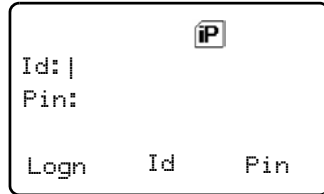
- 3 The user login screen appears.



The image shows a rectangular display screen with a black border. In the top right corner, there is a small icon of a radio with the letters 'iP' next to it. Below this, the text 'Id: |' is displayed on one line, and 'Pin:' is displayed on the line below it. At the bottom of the screen, there are three labels: 'Logn' on the left, 'Id' in the center, and 'Pin' on the right.

■ To Login as a User

- 1 Press  below Id to enter your username at the prompt.



The screenshot shows a login interface with a black border. In the top right corner is a small icon of a person with 'iP' next to it. Below this, the text 'Id: |' is displayed, followed by 'Pin:'. At the bottom, there are three labels: 'Logn', 'Id', and 'Pin'. The 'Id' label is positioned directly below the 'Id: |' prompt.

- 2 You can enter a username via direct entry using the keypad multi-tap function. Refer to “Writing Text” on page 79 for information on using the keypad for direct text entry.

OR

Select a predefined username from the list of predefined username. See “Selecting a Predefined Username” on page 73. for information on how to add a predefined username.

Note: *Valid characters for username entry are capital letters A-Z, small letters a-z, numbers 0-9, ‘*’, ‘#’, ‘-’, ‘/’ and the space character . Maximum username length is 8 characters.*

- 3 Press  below Pin to enter your PIN (Personal Identification Number) number at the prompt. Maximum PIN length is 4 digits. PIN number will appear as asterisks.



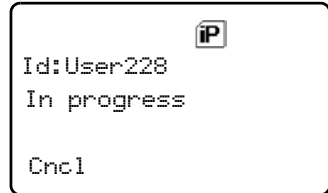
The screenshot shows the same login interface as before. The 'Id:' prompt now shows 'User228' entered. The 'Pin:' prompt shows '****'. The 'Id' label at the bottom is now positioned below the 'Id:User228' text.

4 To log in :

Press  below Logn.

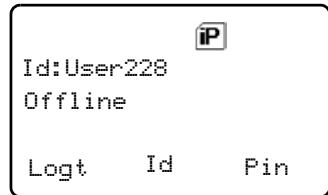
In ARS server mode :

The progress screen appears.



In ARS non-server mode :

The logged in confirmation screen appears.

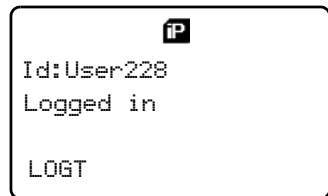


In non-ARS enabled mode :

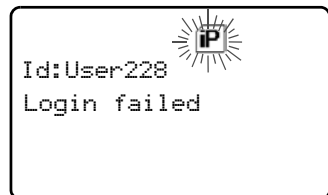
The display shows Offline.

- 5 Press  below Cncl to cancel the log in process and return to the initial user log in screen.

- 6 The logged in confirmation screen appears when the login process is successful. The “successful user login” indicator (IP indicator) will be shown on the display.



- 7 When you enter an invalid username or PIN, login fails and the user login screen will display a momentary text Login failed. The “user login failure” indicator (blinking IP indicator) is shown on the display.



8 To log out :

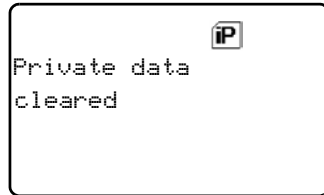
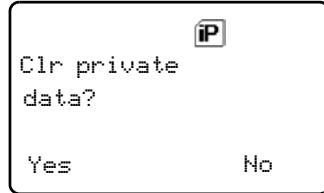
Press  below Logt

Upon pressing the Logt button, a confirmation screen appears.

Press  below Yes to clear all your private data. A momentary text Private data cleared is shown.

OR

Press  below No to keep your private data.



Note: *Private data refers to all messages in the text messaging inbox, Draft and Sent folder. Next user will be able to access Inbox, Draft and Sent messages if private data is not deleted.*

■ Selecting a Predefined Username

- 1 Press  to scroll to the next username.

OR

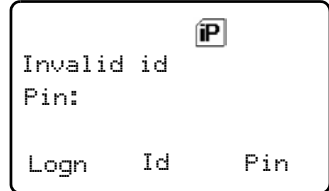
Press  to scroll to the previous username.

Press and hold , to scroll to the next usernames continuously one at a time at a fast scroll rate.

OR

Press and hold , to scroll to the previous usernames continuously one at a time at a fast scroll rate.

- 2 If you log in with a selected predefined username comprising of 8 characters or more, or one with an invalid character, you will see a momentary text Invalid id on the display.



Note: *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 8 characters or more.*

Text Messaging

Text Messaging Service (TMS) is an application service through which you can send and receive text messages. You can send 3 types of text messages, namely

- A new text message (free form messages)
- Predefined messages (quick text messages)
- Edited quick text messages

■ Accessing TMS Feature

Use the Menu

- 1 a) Press  until TMS appears on the display.
b) Press  directly below TMS.



Use the TMS Feature Button

- 1 Press  to access the TMS feature screen.

Use the Preprogrammed TMS Button

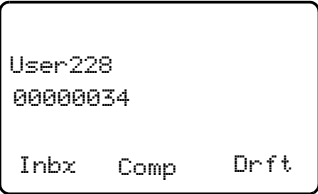
- 1 Press the preprogrammed button to access the TMS feature screen.

Press and hold the preprogrammed button for TMS brings you directly to the Inbox screen.

Note: Any programmable button on the radio can be programmed to access TMS feature.

- 2 The TMS feature main menu consists of Inbox, Compose, Draft, Sent and Back option. See “TMS Menu Options” on page 75. for explanation on each menu option.

Press  or  to scroll through the main menu options.



User228
00000034

Inbx Comp Drft

Table 8: TMS Menu Options

Menu Options	Description/ Function
Inbx	This is used to store new incoming messages or messages that you have received. Inbox can hold up to 30 messages.
Comp	This menu option brings you to the compose screen.
Drft	This is used to store all saved messages or messages that are to be sent at a later time. Draft folder can hold up to 10 messages.

Menu Options	Description/ Function
Sent	This is used to store the messages that you have already sent. Sent folder can hold up to 10 messages.
Back	This menu option brings you back to the TMS main menu or previous menu.
Edit	This menu option brings you to the Quick Text Messages screen.
Save	This menu option allows you to save your messages to the Draft folder.
Rply	This menu option allows you to reply a message.
Del	This menu option allows you to delete a message.
Addr	This menu option allows you to key in the target address, or select one from the list.
New	This menu option allows you to compose a new message.
List	This menu option allows you to select a predefined message.
Imp t	This menu option is used to toggle on/off the "Priority" flag for an outgoing message.
Rgrp	This menu option is used to toggle on/off the "Request reply" flag for an outgoing message.
Curr	This menu option is used to delete the current selected message.
All	This menu option is used to delete all the messages in the current message inbox.

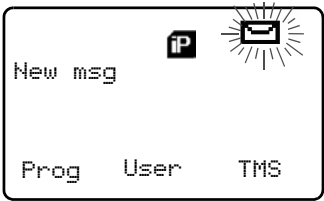
Table 9: TMS Status Symbols

Symbol	Indication
	Priority Message This icon is displayed • when “Priority” is toggled on before sending the message. • in the Inbox folder for messages which are flagged with ‘Priority’.
	Request Receipt This icon is displayed • when “Request Receipt” is toggled on before sending the message. • in the Inbox folder for messages which are flagged with ‘Request Receipt’.
	Inbox Full This icon is displayed when the Inbox Folder is full. If a new message is received when the inbox is full, the icon will be blinking.
	New Message Icon The radio has received a new message.
	Message Sent This icon indicates the selected message has been successfully sent.
	Message Unsent The selected message was not successfully sent.
	Read Message The selected message in the Inbox has been read.

Symbol	Indication
	Unread Message The selected message in the Inbox folder has not been read.
Inbox 3/6	Message Index This icon indicates the index of the current message the user is viewing. Example: if the user is looking at the third message out of a total of 6 messages in the Inbox folder, the icon is displayed as the icon on the left column.
	Num Lock This icon indicates the text entry is currently in num lock mode.
	Normal Mode The text entry is currently in the normal mode.
	Uppercase The text entry is currently in uppercase mode.

■ Receive a Message

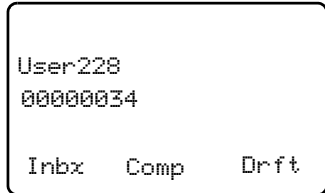
When you receive a message, a momentary text, New msg appears on the display along with a new message icon. If inbox is full, the message icon will be blinking.



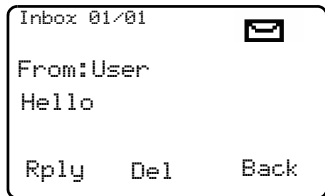
■ To View Message from the Inbox.

- 1 Access TMS (Launch TMS).

- 2 Press  directly below Inbx.



- 3 The Inbox screen appears. The first message in the list is displayed. Inbox can hold up to 30 messages. Message status icons are displayed at the top of the screen.



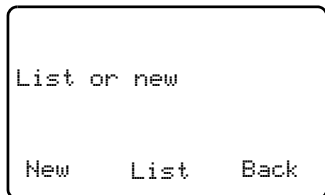
- 4 Scroll to the message you want to read by pressing the  or  button.

Note: If the message fills more than one screen, scroll to read it by pressing  or  button.

- 5 To delete the message, press  below Del. See "Delete a Message" on page 85. for further details.

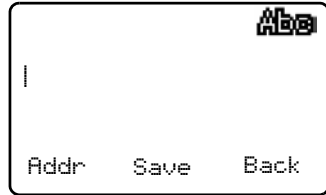
■ Compose a New Text Message

- 1 Press  below Comp to compose a new message
- The Compose Message Screen appears.
List or New option appears on the display.



- 2 Press  below New to type a new message.

A blinking cursor appears on the display indicating point of input.



3 Writing Text

Type your message using the keypad.

Press the key labeled with the desired character, once for the first character, twice for the second, and so on. Refer to table 10 below for complete list of characters.

For example:

To enter "s", press  key four times. To enter "7", press the key five times. If you do not press a key for a few seconds, the character is accepted, and the cursor moves to the next position.

Press  key to delete a character.

Press  key to add a space.

You can move the cursor by pressing  or .

Press and hold 0 to toggle between normal text entry mode, uppercase mode and num lock mode.

Note:i) During the uppercase mode, multi-tapping the keys will only scroll through the uppercase letters.

(Example : A->B->C->2)

- ii) During the num lock mode, pressing the keypad will only enter the numeric digits. Subsequent presses of the same key will insert the same digit to the text message (no multi-tap).

Table 10: Keypad Characters

Key	Number of times the key is pressed (in normal mode)								
	1	2	3	4	5	6	7	8	9
0	0 or press and hold to toggle between normal text entry mode, uppercase mode and num lock mode.								
1	1 . , ? ! ; @ _ - * # & \$ / + = \ " ' ()								
2 abc	a	b	c	2	A	B	C		
3 def	d	e	f	3	D	E	F		
4 ghi	g	h	i	4	G	H	I		
5 jkl	j	k	l	5	J	K	L		
6 mno	m	n	o	6	M	N	O		
7 pqrs	p	q	r	s	7	P	Q	R	S
8 tuv	t	u	v	8	T	U	V		
9 wxyz	w	x	y	z	9	W	X	Y	Z
*	Space								
#	Delete a character								

4 Addressing a Message

Press  below Addr to address your outgoing message.

The Address input screen appears.



Addr: |

Impt Rgrp Back

Press  or  to scroll through the address list.

OR

Use direct address entry via multi-tap.

5 Append a Priority Message or Request Receipt

Before sending your message, you can append a priority message or a request receipt to your message.



Press  below **Impt** to toggle on/off a “Priority” flag for an outgoing message. A ‘Priority’ flag icon is displayed at the top of the screen when it is toggled on.

Press  below **Rqrp** to toggle on/off the “Request Receipt” icon for an outgoing message. A ‘Request receipt’ status icon is displayed at the top of the screen when it is toggled on.

Note:

- The “Priority” flag on a message does not imply that the message will get higher priority over the other messages when it is being transmitted. It is just an indication that can be embedded into a message to indicate to the receiver that the message is important.
 - When you receive a message that is flagged with the “Request Receipt” 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 received such message.
- 6 When an address has been appended to the outgoing message, press the **PTT** button to send your message.

OR

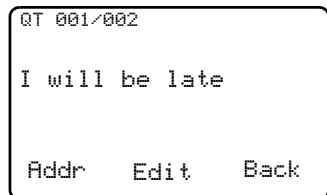
Press  below **Save** to save your message for sending at a later time.

The message will be saved in the “Draft folder”. See “To Access the Draft Folder” on page 86. for further details.

■ Send a Predefined Message

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

- 1 Press  below **List** to use the predefined message
- The first predefined message appears.

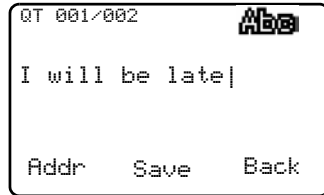


- 2 When a message has been selected from the list, press  below **Addr** to append an address to the outgoing message.
- 3 Press the **PTT** button to send the predefined message.

■ Edit a Quick Text Message

- 1 Press  below **Edit** to edit a quick text message.

The Editing Screen appears.
A blinking cursor appears at the end of the predefined text.



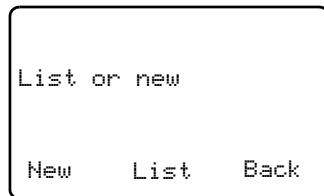
Edit your message using the keypad.

- 2 Press  below **Save** to save the edited changes. The message is saved in the Draft folder.
- 3 When an address has been appended to the outgoing message, press the PTT button to send the edited message.

■ Reply to a Received Message

- 1 Press  below **Rply** to reply to a message

The Compose Message Screen appears.



- 2 Press  below **New** to type a new message.

OR

Press  below **List** to use the predefined message / Quick text message.

OR

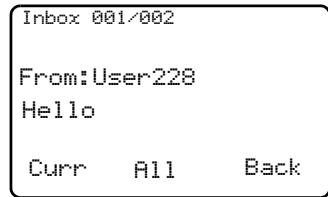
Press  below **Back** to return to TMS main menu.

■ Delete a Message

- 1 From the Inbox, Draft or Sent screen, scroll to select a message for deletion.

- 2 After selecting a message, press  below Del. The display shows 2 delete options.

Press  below Curr to delete only the current message.



```
Inbox 001/002
From: User228
Hello
Curr      All      Back
```

OR

Press  below All to delete all messages.

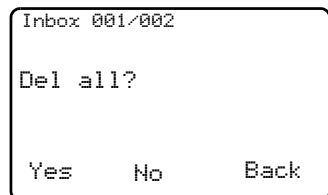
OR

Press  below Back to return to previous menu.

- 3 When you select to delete all messages, a confirmation screen appears.

Press  below Yes to delete all messages.

Press  below No to return to previous screen.



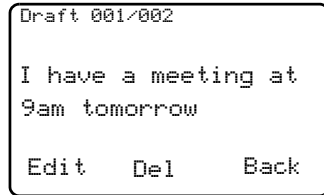
```
Inbox 001/002
Del all?
Yes      No      Back
```

■ To Access the Draft Folder

The Draft folder stores the messages that were saved previously. Newest saved message is appended at the bottom of the list. Draft folder can hold up to 10 messages. The oldest draft in the folder is deleted when the 11th message comes in.

- 1 Press  below Draft. The Draft screen appears.

The first draft in list is displayed.



- 2 Press  or  to scroll through the list of drafts.

■ To Access the Sent Folder

The Sent folder stores the messages that were sent out previously. Newly sent message is appended where the newest message is at the beginning of the list and the oldest message is at the bottom of the list. The oldest Sent message in the folder is deleted when the 11th message comes in.

- 1 Press  below Sent. The Sent screen appears. The first sent message in the list is displayed. A message delivery icon will be displayed at the top right corner of the screen.



- 2 Press  or  to scroll through the list of other messages that have been sent.

Helpful Tips

Radio Care



Caution

- The XTS 4000 radio casing has two vent ports that allow for pressure equalization in the radio. Never poke these vents with any objects, such as needles, tweezers, or screwdrivers. This could create leak paths into the radio and the radio's submergibility will be lost.
- **(For XTS 4000 R Radios Only)** Elastomer technology materials used for seals in rugged portable radios can age with time and environmental exposure. Therefore, Motorola recommends that rugged radios be checked annually as a preventive measure in order to assure the watertight integrity of the radio. Motorola details the disassembly, test, and reassembly procedures along with necessary test equipment needed to inspect, maintain and troubleshoot radio seals in the radio's service manual.
- If the radio battery contact area has been submerged in water, dry and clean the radio battery contacts before attaching a battery to the radio. Otherwise, the water could short-circuit the radio.



Caution

- If the radio has been submerged in water, shake the radio well so that any water that may be trapped inside the speaker grille and microphone port can be removed. Otherwise, the water will decrease the audio quality of the radio.
- Do not disassemble the radio. This could damage radio seals and result in leak paths into the radio. Any radio maintenance should be performed only by a qualified radio technician.

Cleaning

To clean the external surfaces of your radio:

- 1 Combine one teaspoon of mild dishwashing detergent to one gallon of water (0.5% solution).
- 2 Apply the solution sparingly with a stiff, non-metallic, short-bristled brush, making sure excess detergent does not get entrapped near the connectors, controls or crevices. Dry the radio thoroughly with a soft, lint-free cloth.
- 3 Clean battery contacts with a lint-free cloth to remove dirt or grease.



Caution

Do not use solvents to clean your radio. Spirits may permanently damage the radio housing.

Do not submerge the radio in the detergent solution.

Handling

- Do not pound, drop, or throw the radio unnecessarily. Never carry the radio by the antenna.
- Avoid subjecting the radio to an excess of liquids. Do not submerge the radio unless it is a ruggedized, XTS 4000 R model.
- Avoid subjecting the radio to corrosives, solvents or spirits.
- Do not disassemble the radio.
- Keep the accessory-connector cover in place until ready to use the connector. Replace the cover immediately once the accessory has been disconnected.

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 an additional period of either one or two years beyond the normal expiration date of the standard warranty. For more information about ESP, contact the Motorola Radio Support Center at 3761 South Central Avenue, Rockford, IL 61102 (800) 227-6772 / (847)725-4200.

Battery

Battery Life

Battery life is determined by several factors. Among the more critical are the regular overcharge of batteries and the average depth of discharge with each cycle. Typically, the greater the overcharge and the deeper the average discharge, the fewer cycles a battery will last. For example, a battery which is overcharged and discharged 100% several times a day, will last fewer cycles than a battery that receives less of an overcharge and is discharged to 50% per day. Further, a battery which receives minimal overcharging and averages only 25% discharge, will last even longer.

Charging the Battery

Motorola batteries are designed specifically to be used with a Motorola charger and vice-versa. Charging in non-Motorola equipment may lead to battery damage and void the battery warranty. Motorola-authorized battery chargers may not charge batteries other than the ones listed on page 93.

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

Battery Charge Status

Your radio can indicate your battery's charge status through:

- vibrations and sounds
- fuel gauge symbol on the display

LED and Sounds

When your battery is low:

- if vibration is turned on, your radio will vibrate when battery is low.
- you hear a low-battery “chirp” (short, high-pitched tone)

Fuel Gauge Symbol

The radio indicates the current battery charge level through a fuel gauge symbol. Refer to the table below for more information.

Fuel Gauge Indicator	Charge Level
	75% - 100%
	50% - 74%
	25% - 49%
	11% to 24%
	0% -10%

Battery Recycling and Disposal

Lithium Ion (Li-Ion) rechargeable batteries can be recycled. However, recycling facilities may not be available in all areas. Under various U.S. state laws and the laws of several other countries, Li-Ion batteries must be recycled and cannot be disposed of in landfills or incinerators. Contact your local waste management agency for specific requirements and information in your area.

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

For the location of the drop-off facility closest to you, access RBRC's Internet web site at www.rbrc.com or call 1-800-8-BATTERY. This internet site and telephone number also provide other useful

information concerning recycling options for consumers, businesses, and governmental agencies.

Accessories

Motorola provides the following approved accessories to improve the productivity of your XTS 4000 portable two-way radio.

Antennas

NAD6582_	Antenna 136 - 151 MHz
NAD6581_	Antenna 145 - 166 MHz
NAD6583_	Antenna 162 - 174 MHz

Batteries and Battery Accessories

NNTN6944_	630 mAh Standard Li-Ion Battery
-----------	---------------------------------

Carry Accessories

Belt Clips

NNTN6945_	Plastic Belt Clip
NNTN6946_	Leather Belt Clip

Chargers

EPNN9229_	Covert Charger US 110V AC
EPNN9230_	Covert Charging Cradle
EPNN9231_	Covert Charger 12V Vehicular

Surveillance Accessories

Headsets and Earpieces

SYN8390_	Earbud with Microphone
NNTN5006BP	Headset Earbud with PTT
NNTN5211_	2-wire Surveillance Kit

Notes

Appendix: Maritime Radio Use in the VHF Frequency Range

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.

Table A-11: VHF Marine Channel List

Channel Number	Frequency (MHz)	
	Transmit	Receive
1	156.050	160.650
2	156.100	160.700
*	156.150	160.750
4	156.200	160.800
5	156.250	160.850
6	156.300	–
7	156.350	160.950

Table A-11: VHF Marine Channel List (Continued)

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
24	157.200	161.800
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

Table A-11: VHF Marine Channel List (Continued)

Channel Number	Frequency (MHz)	
	Transmit	Receive
67**	156.375	156.375
68	156.425	156.425
69	156.475	156.475
71	156.575	156.575
72	156.625	—
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.

ACK	Acknowledgment of communication.
Active Channel	A channel that has traffic on it.
Analog Signal	An RF signal that has a continuous nature rather than a pulsed or discrete nature.
ASTRO 25 Trunking	Motorola standard for wireless digital trunked communications.
ASTRO Conventional	Motorola standard for wireless analog or digital conventional communications.
Autoscan	A feature that allows the radio to automatically scan the members of a scan list.
Call Alert	Privately page an individual by sending an audible tone.
Carrier Squelch	Feature that responds to the presence of an RF carrier by opening or unmuting (turning on) a receiver's audio circuit. A squelch circuit silences the radio when no signal is being received so that the user does not have to listen to "noise."
Central Controller	A software-controlled, computer-driven device that receives and generates data for the trunked radios assigned to it. It monitors and directs the operations of the trunked repeaters.
Channel	A group of characteristics such as transmit/receive frequency pairs, radio parameters, and encryption encoding.
Control Channel	In a trunking system, one of the channels that is used to provide a continuous, two-way/data communications path between the central controller and all radios on the system.

Conventional	Typically refers to radio-to-radio communications, sometimes through a repeater (see Trunking).
Conventional Scan List	A scan list that includes only conventional channels.
Cursor	A visual tracking marker (a blinking line) that indicates a location on the display.
Deadlock	Displayed by the radio after three failed attempts to unlock the radio. The radio must be powered off and on prior to another attempt.
Digital Private Line (DPL)	A type of coded squelch using data bursts. Similar to PL except a digital code is used instead of a tone.
Digital Signal	An RF signal that has a pulsed, or discrete, nature, rather than a continuous nature.
Dispatcher	An individual who has radio system management duties.
Dynamic Regrouping	A feature that allows the dispatcher to temporarily reassign selected radios to a single special channel so they can communicate with each other.
Failsoft	A feature that allows communications to take place even though the central controller has failed. Each trunked repeater in the system will transmit a data word informing every radio that the system has gone into failsoft.
FCC	Federal Communications Commission.
Hang Up	Disconnect.
Home Display	The first display information after the radio completes its self test.

KVL	Key-variable loader: A device for loading encryption keys into the radio.
LCD	Liquid crystal display.
LED	Light-emitting diode.
Menu Entry	A software-activated feature shown at the bottom of the display — selection of these features is controlled by the  ,  , and  buttons.
Monitor	Check channel activity by pressing the Monitor button. If the channel is clear, you will hear static. If the channel is in use, you will hear conversation. It also serves as a way to check the volume level of the radio, since the radio will “open the squelch” when pressing the monitor button.
Network Access Code	Network Access Code (NAC) operates on digital channels to reduce voice channel interference between adjacent systems and sites.
NiCd	Nickel-cadmium
NiMH	Nickel-metal-hydride.
Non-tactical/Revert	The user will talk on a preprogrammed emergency channel. The emergency alarm is sent out on this same channel.
OTAR	Over-the-air rekeying.
Page	A one-way alert, with audio and/or display messages.
Personality	A set of unique features specific to a radio.
Preprogrammed	Refers to a software feature that has been activated by a qualified radio technician.

Private (Conversation) Call	A feature that lets you have a private conversation with another radio user in the group.
Private Line (PL)	A sub-audible tone that is transmitted such that only receivers decoding the tone will receive it.
Programmable	Refers to a radio control that can have a radio feature assigned to it.
PTT	Push-To-Talk — the PTT button engages the transmitter and puts the radio in transmit (send) operation when pressed.
Radio Frequency (RF)	The part of the general frequency spectrum between the audio and infrared light regions (about 10 kHz to 10,000,000 MHz).
Repeater	A conventional radio feature, where you talk through a receive/transmit facility that re-transmits received signals, in order to improve communications range and coverage.
Selective Call	A feature that allows you to call a select individual, intended to provide privacy and to eliminate the annoyance of having to listen to conversations of no interest to you.
Selective Switch	Any digital P25 traffic having the correct Network Access Code and the correct talkgroup.
Squelch	Special electronic circuitry, added to the receiver of a radio, that reduces, or cuts off, unwanted signals before they are heard in the speaker.
Standby	An operating condition whereby the radio's speaker is muted but still continues to receive data.

Status Calls	Pre-defined text messages that allow the user to send a conditional message without talking.
Tactical/Non-revert	The user will talk on the channel that was selected before the radio entered the emergency state.
Talkaround	Bypass a repeater and talk directly to another unit for easy local unit-to-unit communications.
Talkgroup	An organization or group of radio users who communicate with each other using the same communication path.
Talkgroup Scan List	A scan list that can include both talkgroups (trunked) and channels (conventional).
Trunking	The automatic sharing of communications paths between a large number of users (see Conventional).
Trunking Priority Monitor Scan List	A scan list that includes talkgroups that are all from the same trunking system.
USK	Unique Shadow Key.
Zone	A grouping of channels.

Notes

Commercial Warranty

Limited Warranty

MOTOROLA COMMUNICATION PRODUCTS

I. WHAT THIS WARRANTY COVERS AND FOR HOW LONG:

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

ASTRO XTS 4000 Portable Units	One (1) Year
Product Accessories	One (1) Year

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

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

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

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

II. GENERAL PROVISIONS:

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

III. STATE LAW RIGHTS:

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

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

IV. HOW TO GET WARRANTY SERVICE:

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

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

V. WHAT THIS WARRANTY DOES NOT COVER:

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

the time the Product was initially distributed from MOTOROLA.

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

VI. PATENT AND SOFTWARE PROVISIONS:

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

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

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

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, USA.

