MOTOROLA SOLUTIONS

ADVISOR™ TPG2200 TETRA Two-way Pager Feature User Guide

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Chapter 1

General Information

1.1
Safety Information

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

ATTENTION!

This radio is restricted to Occupational use only. Before using your radio, read the RF Energy Exposure and Product Safety Guide for Portable Two-Way Radios that contains important operating instructions for safe usage and RF energy awareness and control for Compliance with applicable standards and Regulations. Note that Push-to-Talk (PTT) and in front of the face operating instructions are not applicable for this pager and can be ignored.

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

https://www.motorolasolutions.com

Under Innovation, Science, and Economic Development Canada (ISED) regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by ISED. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter has been approved by ISED to operate with Motorola Solutions-approved antenna with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Installation Requirements for Compliance with Radio Frequency (RF) Energy Exposure Safety Standards

⚠️ **ATTENTION:**
This radio is intended for use in occupational or controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer, or any other use.

To ensure compliance to RF Energy Safety Standards:

- Install only Motorola Solutions approved antennas and accessories.

- Be sure that antenna installation is per Vehicle Antenna Installation.

- Be sure that Product Safety and RF Safety Booklet enclosed with this radio is available to the end user upon completion of the installation of this radio.

1.2
Icon Conventions

The documentation set is designed to give the reader more visual clues. The following graphic icons are used throughout the documentation set.

DANGER: The signal word DANGER with the associated safety icon implies information that, if disregarded, will result in death or serious injury.

WARNING: The signal word WARNING with the associated safety icon implies information that, if disregarded, could result in death or serious injury, or serious product damage.

CAUTION: The signal word CAUTION with the associated safety icon implies information that, if disregarded, may result in minor or moderate injury, or serious product damage.

CAUTION: The signal word CAUTION may be used without the safety icon to state potential damage or injury that is not related to the product.

IMPORTANT: IMPORTANT statements contain information that is crucial to the discussion at hand, but is not a CAUTION or WARNING. There is no warning level associated with the IMPORTANT statement.

NOTE: NOTICE contains information more important than the surrounding text, such as exceptions or preconditions. They also refer the reader elsewhere for additional information, remind the reader how to complete an action (when it is not part of the current procedure, for instance), or tell the reader where something is on the screen. There is no warning level associated with a notice.

1.3
Using this Guide

IMPORTANT: The term *radio* used throughout this manual also refers to the pager and other radio communication devices.

The following special notations are used throughout the text to highlight certain information or items:

Table 1: Special Notations

Example	Description
Menu key	Bold words indicate a name of a key, button, or soft menu item.
Entering TMO tone	Italic words indicate a name of the tone.
`Powering Off`	Typewriter words indicate the MMI strings or messages displayed on the radio.
Setup → All Tones	Bold words with the arrow between indicate navigation structure in the menu items.

1.4
Feature and Service Availability

This guide describes all available radio features and services. Your service provider may have customized your radio to optimize its use for your individual needs. Check with your service provider to find out the differences from this guide.

Getting Started

Familiarize yourself with basic information on how to use your radio.

2.1
Product Technical Information

Table 2: Product Technical Information

Description	Value	
Maximum Voltage	4.2 V	
Maximum Current	3 A	
Maximum RF Power	1 or 1.8 W (switchable)	
Maximum Speaker Load	8 Ω at 15 %	
Operating Temperature Range	-20 °C to +60 °C	
Storage Temperature Range	-30 °C to +70 °C	
Ingress Protection Rating	IP54	
Audio Power Through the Radio	Internal Audio Power:	RMS: 1 W
Operating Time	Duty Cycle	
2300 mAh Battery	Battery Performance: Up to 48 Hours	
	NOTE: Measured under standard test conditions. Actual results may vary.	

NOTE:
The system (SwMI) determines radio transmit and receive times, which affect the actual radio operating time.

If the radio overheats (due to high ambient temperature or other factors), thermal protection will reduce transmitter power, which may lead to loss of communication.

2.2
Before Power On

Read this section before you power on your radio for the first time.

2.2.1
Removing and Attaching the Battery Cover

Procedure:

To remove the battery cover:

1. Slide the **Battery Cover Lock** key to the left to unlock the battery cover.
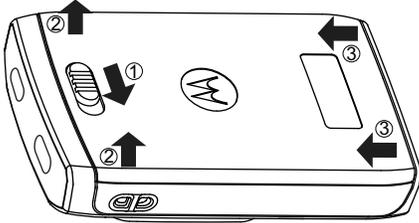
2. Remove the battery cover completely from the radio.

To attach the battery cover:

> **NOTE:** Ensure that the **Battery Cover Latch** is at the Unlock position before attaching the battery cover.
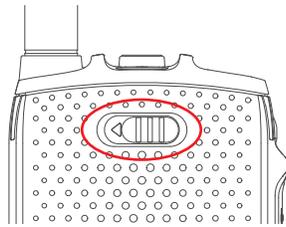
3. Insert the bottom tabs of the battery cover into the slot.

4. Press the battery cover down and lock the battery cover by sliding the **Battery Cover Lock** key to the right.
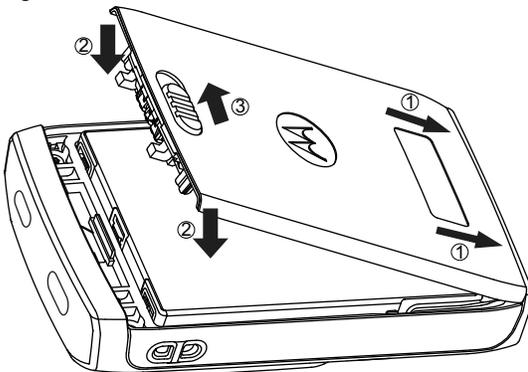
2.2.2
Installing the Battery

Procedure:

1. Insert battery into the compartment as illustrated until the contacts align and the battery hooks in place.
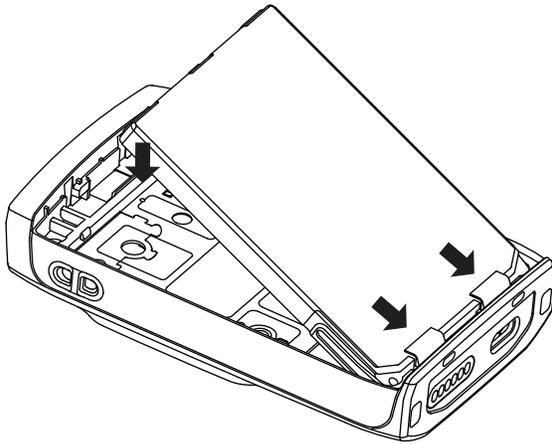
2. Press the battery downward until it clicks.

2.2.3
Removing the Battery

Prerequisites: Turn off the radio.

Procedure:

1. Pull the slot at the top of the battery to release it.

2. Lift out the battery.

2.2.4
Installing the SIM Card

Prerequisites:
Ensure that your radio is equipped with a SIM card slot.

Procedure:

1. Remove the battery cover and battery.

2. Flip open the SIM card door of the radio.

   Figure 1: Opening the SIM Card Door
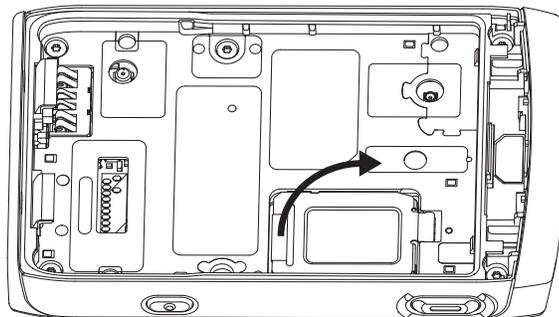
3. Slide up and unlock the SIM connector door (as indicated by the arrow engraved on the SIM connector door).

4. Flip open the SIM connector door.

Figure 2: Opening the SIM Connector Door
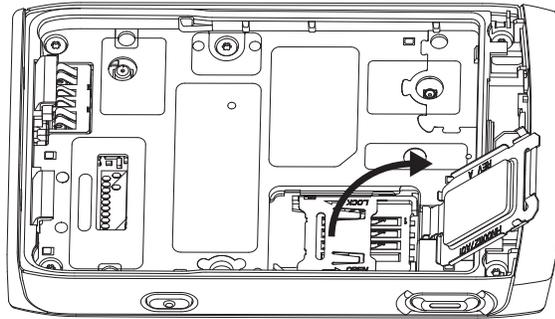
5. Insert the SIM card into the SIM connector slot, ensuring that the gold contact area is facing down.

Figure 3: Inserting SIM Card
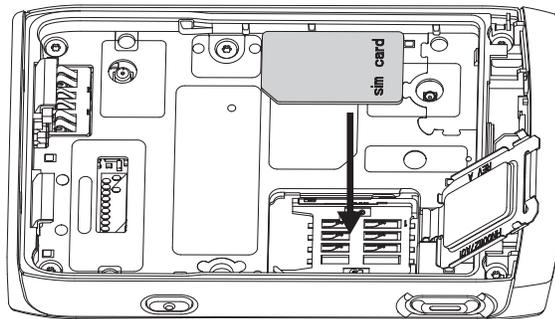
6. Close the SIM connector door and slide it to lock (as indicated by the arrow engraved on the SIM connector door).

Figure 4: Closing the SIM Connector Door
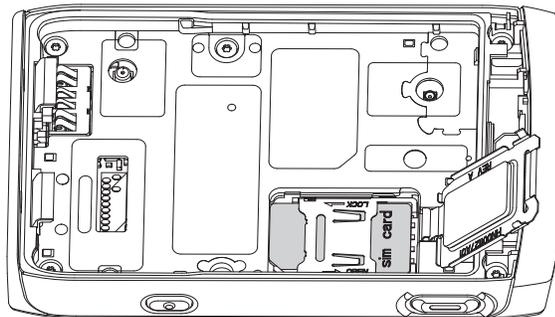
7. Close the SIM card door.

8. Install the battery and attach the battery cover.

2.2.5

Removing the SIM Card

Procedure:

1. Remove the battery cover and battery.

2. Flip open the SIM card door of the radio.

Figure 5: Opening the SIM Card Door
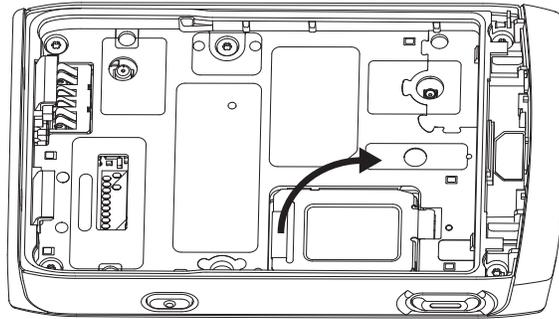
3. Slide up and unlock the SIM connector door (as indicated by the arrow engraved on the SIM connector door).

4. Flip open the SIM connector door.

Figure 6: Opening the SIM Connector Door
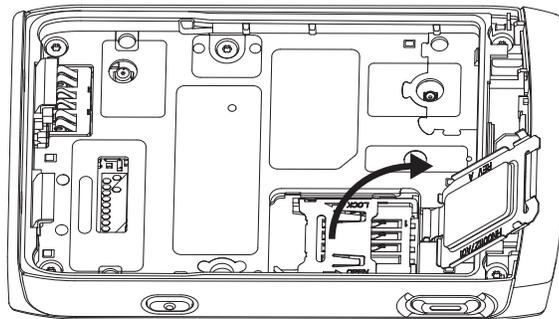
5. Remove the SIM card from the SIM connector slot.

6. Close the SIM connector door and slide it to lock (as indicated by the arrow engraved on the SIM connector door).

Figure 7: Closing the SIM Connector Door
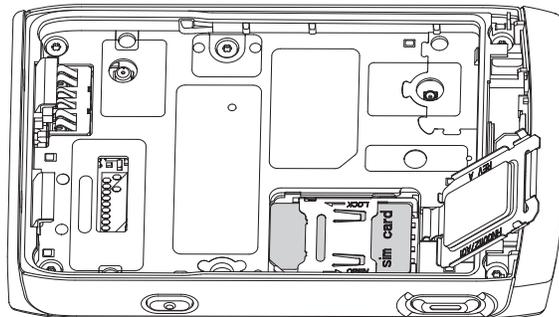
7. Close the SIM card door.

8. Install the battery and attach the battery cover.

2.2.6
Charging the Battery

IMPORTANT:
Use only Motorola Solutions-approved chargers and cables, which provide optimal performance. Using other chargers may fail to fully charge, or reduce the life of the battery.

Do not charge the battery in a hazardous area.

Do not connect a radio without a battery to the charger.

You can charge a battery separately or attached to your radio.

Procedure:

1. Connect the charger to an appropriate power source, according to the specification of the charger.

   NOTE: The charger must be connected to a power outlet that is nearby and easily accessed.

2. Perform one of the following actions:

   ● Desktop chargers – insert the battery or the radio with the battery attached into the appropriate socket of the charger. Ensure that the battery/radio made good connection with the charger. If the battery is inserted, the LED on the charger illuminates indicating that charging is in progress. If the radio with the battery attached is inserted, the Charge Indicator LED on the radio illuminates instead.

   ● Travel chargers and car chargers – connect the charger to the radio with the battery attached. Ensure that the charger is firmly connected to the radio and that the radio display is indicating that charging is in progress.

   ● Home station – insert the radio with the battery attached into the home station pocket. Ensure that the radio is properly seated in the home station pocket and that the LED on the radio is indicating that charging is in progress.

   NOTE:
   If a multi-unit charger LED indicates an error (blinking red light) when the radio is inserted and being charged, reinsert the radio. If the light is still red after several reconnections to MUC, the battery may be damaged or reached its end of life.

Postrequisites: The battery may heat up during charging. After charging, make sure that the battery and the radio are within the operating temperature range before using the radio.

2.2.7

Battery Charging Indications

When the radio is charging, it displays the Charger Mode screen. The screen displays an appropriate Battery Charge Progress icon and charging progress expressed in percentage. When the battery level drains and reaches the threshold, the radio displays `Low battery`.

> **NOTE:**
> The charging condition of a fully depleted battery only has its charging icon displayed after approximately 20–35 minutes. The red LED indicator serves as the primary indicator during the trickle charging state.
>
> To easily identify the charging status, check the Battery Charging LED Indicator. See LED Indications on page 75.

Figure 8: Charger Mode Screen
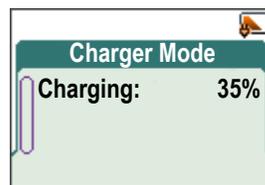
Table 3: Battery Icons

Battery Capacity						
0%–5%	5%–15%	15%–25%	25%–40%	40%–60%	60%–80%	80%–100%

Battery Charge Progress						
0%–5%	5%–15%	15%–25%	25%–40%	40%–60%	60%–80%	80%–100%

2.2.7.1

Acknowledging Low Battery Indication

Procedure:

Perform one of the following:

- Press **OK** to close the dialog box.
- Press **Snooze** to close the dialog box for the set duration.

2.2.8

Low Battery Indication

The radio indicates low battery level by playing an audible alert when the battery charge falls to a preset level. The default setting is 5 %. The service provider also configures how frequently the alert repeats.

2.3
TPG2200 Controls and Indicators

The simple-to-use controls and indicators of the Advisor TPG2200 TETRA Two-way Pager allows you to quickly read and respond to alerts received on the radio.
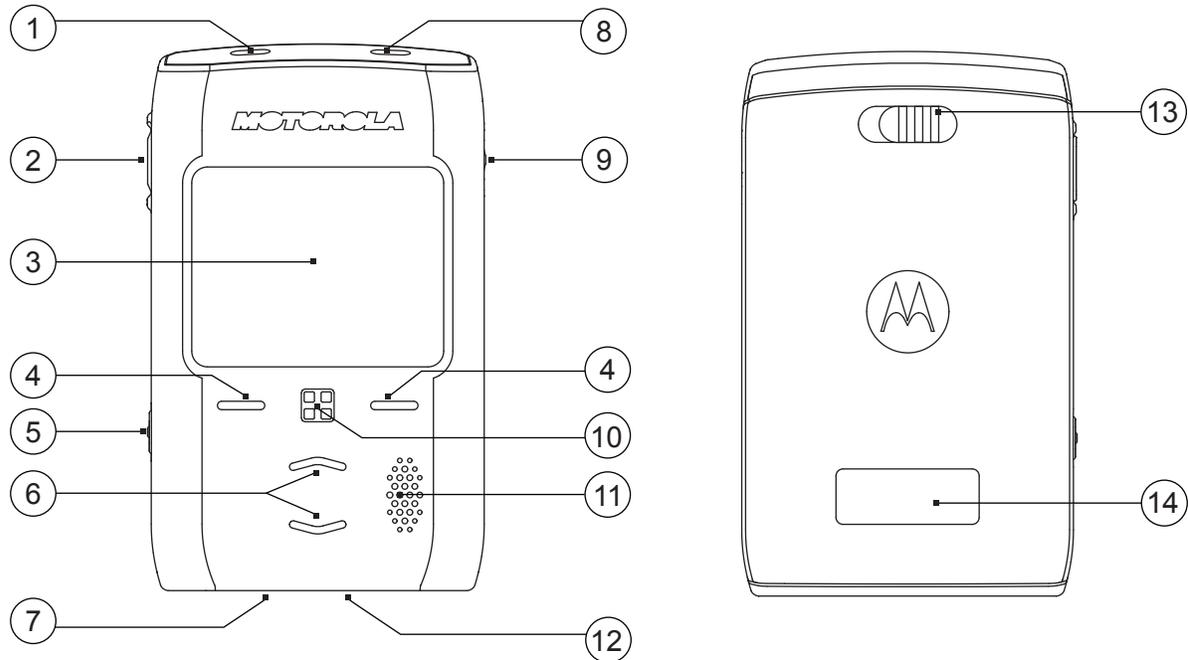
Table 4: Advisor TPG2200 TETRA Two-way Pager Controls and Indicators

Annotation	Description
1	LED Message Indicator Indicates incoming message or call-out.
2	**Power/Sleep/Wake** button ● Press and hold to turn the radio on or off. ● Press to lock or unlock the radio.
3	Full Color Display Bright 2 in. full color Quarter Video Graphics Array (QVGA) display.
4	**Soft** key Press **Left** or **Right** Soft key, to select the option that appears above.
5	**Mute/Shortcut** button ● Press and hold to add a shortcut for menu items. ● Press to temporarily stop the tone and LED indication of the active call out session.
6	**Up** or **Down** navigation button The **Up** or **Down** navigation button supports the following functions: ● List scrolling ● Navigating around the menu hierarchy

Annotation	Description
	- Increasing or decreasing the volume - Activating the assigned One-Touch Button feature
7	USB Connector The USB Type-C™ connector supports charging and programming. NOTE: When an active KVL device is connected to radio using the USB connector, the radio draws current consumption from the KVL device and start charging.
8	LED Coverage Indicator - Shows the coverage status while transmitting and receiving over the network. - Shows the battery status when the radio is charging.
9	Wrist Strap Holes
10	**Menu** button - Press and hold to display idle screen. - From the home screen, press to enter the main menu. - Used to enter context-sensitive menus. - Used as Right Navigation button for selected menu items.
11	Speaker
12	Input/Output Connector Provides enhanced coverage when the radio is docked on the Home Station.
13	**Battery Cover Lock** key - Slide to the left to unlock the battery cover. - Slide to the right to lock the battery cover.
14	Nameplate

2.4
Powering On the Radio

Procedure:

Press and hold **On** button until the status LED light up.

Result: Your radio performs a self-check and registration routine.
After successful registration, your radio is in service.

2.5
PIN Code Authentication

If pre-set by your service provider, your radio has active PIN Code Authentication, which helps you increase security and protect your radio against unauthorized use.

The BSI PIN code is read from the TETRA SIM card and cannot be changed or disabled. However, the general PIN code read from the codeplug configuration can be changed and disabled using radio HMI or codeplug. If the radio is locked, no activities are allowed on the radio.

You are asked to enter the PIN code each time you turn on your radio.

> **NOTE:**
> If your radio is using BSI PIN authentication, the radio disables the general PIN authentication.

2.5.1
Unblocking Your Radio

If you have entered the incorrect PIN code for more than three times (by default), use the PIN Unblocking Key (PUK) to unblock your radio.

Prerequisites: Radio displays `Unit Blocked Enter PUK`.

Procedure:

1. Enter the PUK code at the prompt.

   > **NOTE:** The PUK is a primary code provided by your service provider. For radios with general PUK authentication, the PUK length is a fixed 8-digit code. For radios with BSI PUK authentication, the PUK length is configurable by your service provider up to a maximum of 8-digit code.

   When PUK code is successfully entered, radio displays the PIN code prompt.

2. Enter the PIN code at the prompt.

   > **NOTE:** If change PIN option is enabled by your service provider, you are able to change your PIN code. Enter your new PIN code twice to change the PIN code.

2.6
Display

This section presents the default home screen elements of the radio.

Figure 9: Default Home Screen with Icons
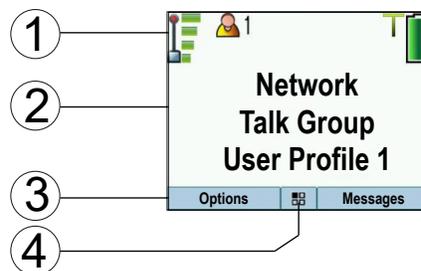
Table 5: Display

Annotation	Description
1	Status icon area
2	Text display area
3	Soft key area
4	Menu/Context sensitive icon

The color of the Soft key area changes according to the mode the radio is in.

Table 6: Colors of the Soft Key Area

Color	Mode or State
Light blue	Normal TMO and DMO Modes
Light red	Emergency Mode
Olive	Local Site Trunking Mode
Yellow	Call Out – Standby
Red	Call Out – Alert
Green	Call Out – Accepted
Blue	Radio Messaging Service (RMS)

2.6.1
Configurable Idle Screen

Your service provider can configure the information that is displayed on the idle screen below the status icon area. The displayed information depends on your radio configuration and services supported.

- Audio Profile Name
- BSI Registration Status
- Home Mode
- Individual Short Subscriber Identity (ISSI)
- Last Sent Tactical Availability
- Network (No Service, or Mobile Country Code (MCC)/Mobile Network Code (MNC), or Networks Alias)
- Operational-Tactical Address (OPTA)
- Radio Status
- Range
- RMS/FMS
- Selected User Profile
- Talkgroup Alias
- Time and Date
- Volume

Order and visibility of these items are also subject of the Configurable Idle Screen settings.

2.6.2
Assignable Softkeys Functions

Users can configure the softkeys functionality with a list of predefined menu items.

The assigned functions on the softkeys are only operational while in idle screen. Both left and right softkeys should be configurable in CPS, with the following options to choose from:

> **NOTE:** If both left and right softkeys are configured to the same functionality, then only the left softkey is visible.

- Shortcuts
- CO Box

- Messages (original in right softkey)

- Options (original in left softkey)

- User Profile

- Audio Profile

- Settings

- Display

- My Info

- Networks (for TMO/DMO switching)

> **NOTE:** This configurable is NOT OTB, thus limited to selected menu items only.

2.7
Status Icons

Status icons appear when your radio is engaged in certain activities or when you have activated certain features.

Depending on your service provider settings, status icons can appear in normal or large size. By default, they are large on the home screen and normal when browsing though the radio menu.

Table 7: Status Icons

Icon	Description
Trunked Mode Operation (TMO)	
	Unit Not Attached – Indicates that there are unattached Talkgroups in the radio.
	Trunked Mode Operation
or	In Service
or	No Service
or	Signal Strength – The more bars, the stronger the signal.
HI or	RF Power – Indicates that High RF Power is enabled. Shows the signal strength. The more bars, the stronger the signal.
	Migration – Indicates that the radio is registered to a foreign network.
Direct Mode Operation (DMO)	
	Direct Mode – Indicates that radio is in Direct Mode (radio-to-radio communication).
	DMO Gateway Communication Mode – Indicates that gateway is selected. The icon has the following status: • Solid – when the radio is synchronized with the gateway.

Icon	Description
	● Blinking – when the radio is not synchronized or during attachment.
	● No icon – during radio-to-radio and repeater communication.
	DMO Repeater Communication Mode – Indicates that the **Repeater** or **GW + Rep** option in DMO Mode is selected. The icon has the following status:
	● Solid – when the radio has detected the repeater (for example, when the radio receives a presence signal).
	● Blinking – when the radio has not detected the repeater or during attachment.
	● No icon – during a radio-to-radio and gateway communication.
General Icons	
	Graceful Service Degradation Mode
	Selected User Profile – Indicates one out of four user profiles which you can select.
	All Tones Off – Indicates that:
	● Volume is set to 0 (when **Volume Adj. Mode** is set to **Common**).
	● All Tones is set to Off (when **Volume Adj. Mode** is set to **Individual**)
	Vibrate Only – Indicates that the radio vibrates to alert you of an incoming message.
	Vibrate then Ring – Indicates that the radio vibrates and then rings to alert you of an incoming message.
	GPS
	● Solid – the radio has a location fix.
	● Blinking – the radio is acquiring a location fix. This feature is an optional setting and may not be enabled on your radio.
	Battery Strength – Shows the charge of your battery.
	Battery Charging – Indicates that the battery is charging.
	New Message Has Arrived – Indicates that a new message has arrived from a different user profile.
	New Message in Inbox – Indicates that you have unread messages in your **Inbox**.
	Man Down (henceforth known as Fall Alert) Active – Indicates that the Man Down (Fall Alert) feature is active.
	Man Down (Fall Alert) Alert – Indicates that the Man Down (Fall Alert) feature is active. This icon has the following status:
	● Blinking – pre-Alert; the radio signalizes Man Down (Fall Alert) conditions. To exit the pre-Alert state, change the conditions.
	● Solid – the radio enters Alert mode.

Icon	Description
	Man Down (Fall Alert) Failure – Indicates that the Man Down (Fall Alert) device failed.
	Snooze – Indicates that the periodic notice is snoozed.
	Call-Out – Indicates Call-Out alert.
	Call-Out Alert Arrived – Indicates a receipt of a new Call-Out message.
	Call-Out Alert Unread – Indicates unread alert in the **CO Box**.
	Unread New Call-Out – Indicates the new message in other user profiles. The number on the icon represents the user profile with unread messages.
	Encryption Off Blinking – Indicates that the SIM Card E2EE is disabled in DMO and TMO Modes.
	SIM End-to-End Encryption (E2EE) in TMO Indicates that the SIM Card E2EE is enabled in TMO Mode.
or	SIM End-to-End Encryption (E2EE) in DMO Indicates that the SIM Card E2EE is enabled in DMO Mode. Numbers *1* and *2* point to the type of DMO Encryption keys that has been selected.
	Keys Locked – Indicates that keys are locked.
	Remote Control – Indicates that the radio is being remotely controlled and some commands are being executed in the background. For example, when the radio is being controlled by special SDS messages or triggered to send a GNSS location report.

2.8
Entering TMO or DMO Mode

Prerequisites: Your service provider can enable this mode.

Procedure:

1. From the home screen, press **Options**.
2. Select **Trunked Mode**/**Direct Mode**.

2.9
Selecting Talkgroups

Follow these procedures to select talkgroup manually. If the selected talkgroups is an InterSystem Interface (ISI) talkgroup, your radio can migrate to another talkgroup linked network, changing the talkgroup automatically.

Prerequisites: Talkgroups are pre-set by your service provider.

Procedure:

Select **Options** → **TG by Folder**. Select a folder (for example, **Favorite**) and then a talkgroup name.

> 📝 **NOTE:** Your radio can access up to three levels of the folder structure.

2.10
One-Touch Buttons

The One-Touch Button feature allows you to activate a feature by a long key press of the **Up** or **Down** navigation keys. Your service provider can assign one-touch functions to these keys.

Table 8: One-Touch Button Features

Feature	Description
Activation of Covert Mode	Turns Covert Mode on or off.
Call-Out Box	Displays the list of call-out sessions.
Change Audio Profile	Changes to the specific audio profile.
Change Font Level	Increases the font size by one level.
Change User Profile	Changes to a specific User Profile.
Display Operational-Tactical Address (OPTA)	Displays the OPTA.
Flip Display	Rotates the display by 180°.
Location Information Protocol (LIP) Report	Sends a message with the location of the radio to a dedicated address or Selected Talkgroup (DMO Only).
Message Inbox	Displays the list of messages in the Inbox.
Reset to Default	Resets the radio to its default settings.
Scroll User Profile	Changes to another User Profile by scrolling through the available User Profiles.
Selecting Audio Profiles	Changes the audio profile of the radio.
Send Predefined Template (PDT)	Sends a predefined message to a dedicated address.
Send Status Message	Sends a dedicated status message to a dedicated address.
Send User-Defined Template (UDT)	Sends a user-defined message to a dedicated address.
Toggle Backlight Intensity	Regulates the backlight intensity.
Toggle BSI Encryption Enabled or Disabled	Enables or disables BSI encryption.
Toggle DMO or TMO	Toggles between TMO and DMO modes.
Toggle Extra Zoom	Turns Extra Zoom on or off.
Toggle Man Down (Fall Alert) On or Off	Turns the Man Down (henceforth known as Fall Alert) feature on or off.
Toggle RF Power Class	Toggles the RF Power Class between high and normal.

Feature	Description
Toggle Transmit Inhibit Mode (TXI)	Turns TXI on or off.
Unassigned	The radio displays `Unassigned Button` when no feature is assigned to this button.
Universal Time Display	Displays universal time on the home screen.
User Profile List	Displays the list of available User Profiles.
Shortcuts List	Displays the list of shortcuts.

Chapter 3

Modes

This chapter contains information on available modes that the radio can operate in.

3.1
Trunked Mode Operation

Trunked Mode Operation (TMO) requires the switching and management infrastructure.

This operation mode enables various data communication types, such as short data service messages.

Figure 10: Trunked Mode Operation
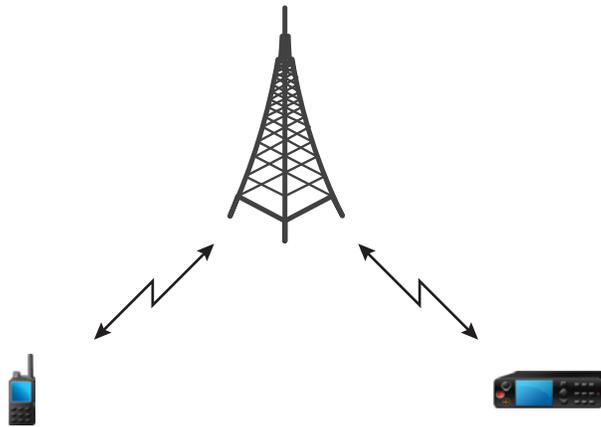
3.1.1
Entering TMO Mode

Procedure:

1. Perform one of the following actions:
   - From the home screen, press **Options**.
   - From the home screen, press the **Menu** key. Select **Networks**.
2. Select **Trunked Mode**.

3.2
Local Site Trunking

This mode is also known as Fallback Mode and it allows more than one radio from the same site to communicate when the link between the site and the network central controller fails. Entering and exiting

Local Site Trunking (that is, returning to System Wide Services) is done automatically. In this mode, some services are unavailable.

NOTE: Your service provider can disable this mode.

3.2.1
Entering Local Site Trunking

When your radio receives a Local Site Trunking indication from the system, the following occurs:

- Your radio sounds an *Entering Local Site Trunking* tone.

- Display shows the `Local Area Service` message.

    NOTE: Noticeable only on the color display.

If configured by your service provider, this message/alert is periodically repeated to remind you that your radio is still operating in Local Site Trunking Mode. The following features are available:

- Registration

- Attachment

- Emergency Operations

NOTE: Your service provider can turn on/off all visual and audio indications, when you enter Local Site Trunking Mode.

3.2.2
Exiting Local Site Trunking

When the link with the central network controller is reestablished, your radio exits Local Site Trunking, and the following occurs:

- Your radio plays an *Exiting Local Site Trunking* tone.

NOTE: Your service provider can turn on/off all visual indications, when you enter Local Site Trunking Mode.

3.3

Direct Mode Operation

Direct Mode Operation (DMO) is a mode of simplex operation where radios communicate directly without the need of a network.

> **NOTE:** For those who use DMO mode, you are recommended to apply DMO SCK for data confidentiality.

Figure 11: Direct Mode Operation
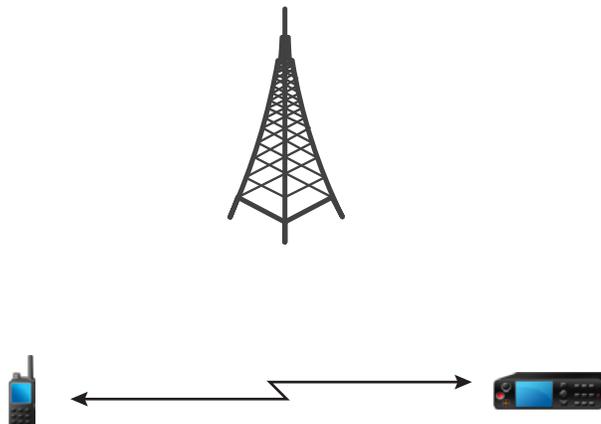
3.3.1

Entering DMO Mode

Procedure:

To enter the DMO Mode:

- From the home screen, press the **Menu** key. Select **Networks → Direct Mode**.
- From the home screen, press the **Menu** key. Select **Options → Direct Mode**.

3.3.2

Selecting DMO Communications Options

When and where to use: Helps to communicate with other radio users on the same talkgroup through the Gateway or Repeater.

Procedure:

1. From the home screen, press **Options**.
2. Press **Config**.
3. Select one of the following options:
   - **MS - MS** – Your radio can communicate only with other radios within its range.
   - **Gateway** – Your radio uses a gateway to communicate with the infrastructure.
     - ○ **Automatic** – Your radio uses the first available gateway for that talkgroup.

○ **Specific** – Your radio uses only the Gateway with the specified Gateway address for that talkgroup.

● **Repeater** – Uses the first available repeater for that talkgroup.

● **GW + Rep** – Uses the first available gateway or repeater for that talkgroup.

○ **Automatic** – Uses the first available gateway for that talkgroup.

○ **Specific** – Uses only the Gateway with the specified Gateway address for that talkgroup.

> **NOTE:** When the Gateway and the Repeater cannot be communicated even though a talkgroup to use them is configured, the radio attempts the direct MS-MS communication. Your service provider can disable any or all of these options.

Result: When your radio detects the appropriate Gateway and/or the Repeater, the Gateway and/or Repeater icons turns solid, respectively.

3.3.3
Communication Through Repeaters

Radios that are out of range and cannot communicate directly with each other in Direct Mode Operation (DMO) can do it through the repeater. The repeater is a radio that repeats all communication on a chosen channel, and as a result increases radios DMO range.

Figure 12: Communication Through Repeaters
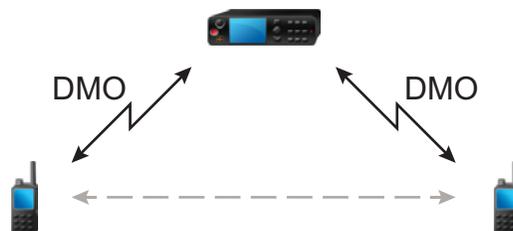
When your radio detects a potential repeater signal or connects to a repeater, it plays a tone, displays the `Repeater available` message, and shows an appropriate icon. When your radio loses connection with the repeater, it plays a tone, displays the `Repeater not available` message, and the repeater icon is blinking.

When your radio is on a Gateway mode, it switches to Gateway mode from TMO if your radio enters an emergency.

3.3.4
Communication Through Gateways

Gateway provides connectivity between radios operating in Direct Mode Operation (DMO) and the TETRA network, so that the DMO radios can communicate with radios operating in Trunked Mode Operation (TMO).

Figure 13: Communication Through Gateways
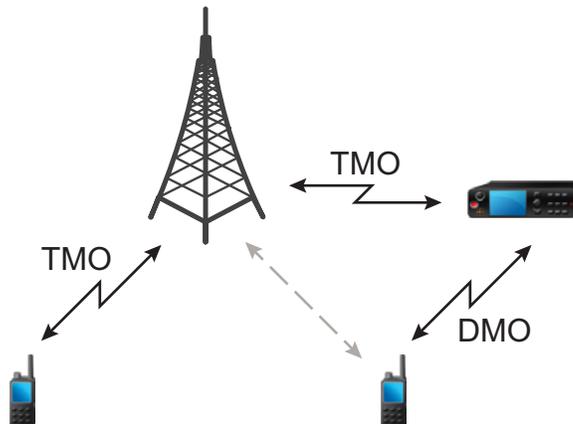
Radio behavior when radio detects a potential repeater signal or connects to a gateway:

- A tone sounds.
- The display shows `Gateway available.`
- The display shows an appropriate icon.

Radio behavior when radio loses connection with the gateway:

- A tone sounds.
- The display shows `Gateway available.`
- The display shows an appropriate icon.

Radio behavior when entering Local Site Trunking:

- A tone sounds.
- The display shows `Local Area Service.`

3.4
Transmit Inhibit Mode

The Transmit Inhibit (TXI) Mode is a mode in which the radio sends no radio transmissions. Activate this mode in RF sensitive areas, for example hospitals, airplanes, where safety can be jeopardized due to transmission radiation.

To activate, select **Menu** → **Networks** → **TXI Mode** → **Activate**.

In this mode, the radio does not transmit under any circumstances. All the functions and keys which cause transmission, for example registration to the network, changing talkgroup or folder, or sending SDS messages are disabled. Any transmission trial causes the radio to display `Not Allowed In TXI Mode` notification and to play a tone.

Your radio can still receive and displays any incoming SDS messages. These messages are stored in the **Inbox**.

When no danger to safety exists anymore, for example, when you leave the RF sensitive area, you can deactivate the TXI Mode and the radio returns to standard operation.

You can deactivate the mode by selecting **Menu** → **Networks** → **TXI Mode** → **Deactivate**, or pressing One-Touch Button.

> **NOTE:** RF Transmissions from the radio are prevented under the following conditions:
>
> - TXI Mode is activated.
> - Battery is removed.
> - The radio is turned off.

On entering or exiting the TXI mode, when the radio is camped on a cell, it sends a specially designated Short Data Service (SDS) status message. This SDS message indicates to the SwMI that the radio is entering or exiting TXI mode.

Mobility procedures that do not require the radio to send an uplink transmission are performed except for cell reselection.

If the radio is turned off in the TXI mode, on turning on, the radio asks whether to exit the TXI mode. If you choose **No**, the radio turns off.

3.5
Emergency Operations

Emergency Operations are used in critical situations.

The Man Down (henceforth known as Fall Alert) alert activates the Emergency Alarm (depending on your service provider settings).

When starting Emergency Operations, the **Menu** key is disabled. If the **Menu** key is pressed during Emergency Mode, the radio displays `Service Restricted`.

3.5.1
Emergency Alarm

The Emergency Alarm is a special status message. Your radio sends the message in either TMO or DMO.

Your radio sends the message each time it enters Emergency Operation. An audible tone sounds for a successfully sent message.

Emergency Alarm in DMO mode can be configured to send in all DMO modes or when your radio is synced through Gateway.

3.5.2
Exiting Emergency Operations

Prerequisites: Make sure that your radio is engaged in Emergency Operations.

Procedure:

   Press and hold the **Exit** soft key.

Result: Your radio exits Emergency Operations.

3.6
Graceful Service Degradation Mode

> **NOTE:** This feature is only available when enabled by your service provider.

The Graceful Service Degradation Mode (GSDM) provides best effort services when the radio enters a weak signal situation. It provides limited services to users where data circuit operation is no longer available in radio traffic mode.

The following services are available in GSDM:

- Call-Out message
- Short Data Service (SDS)
- Status message

NOTE: When in Call-Out protected mode, your radio does not display the notification when entering or exiting GSDM mode.

3.6.1
Entering GSDM

A GSDM enabled radio enters GSDM automatically when a weak signal situation is detected.

The display shows the GSDM icon.

Entering GSDM will not interrupt ongoing services.

NOTE: If configured in the codeplug, the radio remains in Call-Out protected mode, even when entering GSDM.

3.6.2
Exiting GSDM

Your radio exits GSDM in the following conditions:

- Service aggradation – your radio detects improved signal strength.
- Catastrophic service degradation – your radio detects permanent service unavailability.

The display drops the GSDM icon.

Exiting GSDM due to service aggradation will not interrupt ongoing services.

NOTE: The radio remains in Call-Out protected mode even when exiting GSDM.

Chapter 4

Main Menu

This chapter contains information on items in the main menu.

⚠ **IMPORTANT:** Ensure the Menu Configuration is enabled on the CPS to allow the menu settings to be visible on the radio MMI.

4.1
Scrolling through the Menu

Procedure:

1. From the home screen, press the **Menu** key.

2. Scroll to the required item by pressing Navigation keys. Press the Soft key assigned as **Select** to select.

   If the menu item contains a further set of menu items, repeat .

   ✐ **NOTE:** You can use shortcuts to access frequently used items.

4.2
Menu Icons

The following icons make it easy to identify the menu items at first glance.

Table 9: Menu Icons

Menu Icon	Description
	Main Menu Items/Context Sensitive Menu It is assigned to **Menu** when the main menu items/context-sensitive menu are active.
	Messages Send status messages. Send text messages (according to user defined or predefined templates). Received messages in **Inbox**.
	Man Down (henceforth known as Fall Alert) Allows you to activate the Man Down (Fall Alert) feature.
	Security Lets you turn on/off and verify security features, and change passwords.
	Setup Allows you to customize your radio.
	My Info Displays information about your radio and its numbers.

Menu Icon	Description
	Shortcuts Allows you to view and manage shortcuts to menu items.
	Networks Allows you to select a network.
	Location Displays location of your radio.
	Crypto Menu Allows you to manage SIM Card End-to-End Encryption.

4.3

Messages

The messages feature allows you to send and receive text messages. A message can contain up to 1000 characters, depending on your service provider settings.

4.3.1

Inbox

The inbox folder for each user profiles can contains up to 250 messages. Depending on the combination of stored short and long messages in each of these user profiles, the total maximum inbox capacity for all user profiles combined is also 250 messages.

Table 10: Inbox Icons

Icon	Description
	Unread (New) Message
	Read (Old) Message
	Unread (New) Protected Message
	Read (Old) Protected Message
	Protected Message
	Sender Information in Message View – name or number
	Time and Date Stamp in Message View – arrival time and date
	Delivery Status Received – delivery status for Store and Forward messages

4.3.1.1
Receiving New Messages

When you receive a new message, your radio displays the New Message icon, an animation, and plays a tone to indicate the new message.

Procedure:

Select one of the following options:

Option	Description
Read	To read the whole message.
Back	To dismiss the message.
	NOTE: If you dismiss the message, you can access the message later from the inbox.

4.3.1.2
Opening the Inbox

Procedure:

Select **Messages → Inbox**.

The radio displays the status of the inbox for a few seconds (if any):

- `No New or Old Messages`
- `Inbox Full`

4.3.1.3
Using Submenus in Inbox and Outbox

Procedure:

1. Select **Messages → Inbox** or **Outbox**.

2. Use the submenus for the following options:

Option	Actions
Deleting messages	a. Select **Delete**. b. To confirm, select **Yes**.
Deleting all messages from the inbox or outbox	a. Select **Delete All**. b. To confirm, select **Yes**.
Invoking the reply screen and replying with a predefined template	Select **Reply**. NOTE: This option is only applicable for the inbox.
Invoking the reply screen and replying with a predefined template	Select **Resend**. NOTE: This option is only applicable for the outbox.

Option	Actions
Invoking the forward screen with an old message and sending it to the Individual Short Subscriber Identity (ISSI) of the dispatcher	Select **Forward**. 🖉 **NOTE:** You can only forward this message to the ISSI of the dispatcher.
Displaying the date and time of the message when it is in one of the following status: ● Sent ● Delivered ● Read ● Expired and undelivered ● Expired and unread ● Failed due to an unknown error	Select **Delivery Status**. 🖉 **NOTE:** This option is only applicable for the outbox.
Protecting the message from being deleted or overwritten	Select **Protect**.
Removing the message protection	Select **Unprotect**.

4.3.1.4

Immediate Text Message

🖉 **NOTE:** This is a Software Selling Feature.

When you receive a new immediate text message, the radio plays the *New Mail Received* tone.

All immediate text messages are stored in the **Inbox** folder. If the radio is in the PIN Lock state, immediate text message is displayed after you enter the correct PIN.

The message remains on the screen until you press the **End**/**Home** key.

🖉 **NOTE:** The maximum length for receiving an immediate text message is 141-1000 characters.

4.3.2

Outbox

The outbox folder for each user profiles can contains up to 250 messages. Depending on the combination of stored short and long messages in each of these user profiles, the total maximum outbox capacity for all user profiles combined is also 250 messages.

Table 11: Outbox Icons

Icon	Description
	Delivery in Progress
	Delivery Accomplished
	Delivery Failed

Icon	Description
	Successful Outgoing Message
	Failed Outgoing Message
	Protected Message Delivery in Progress
	Protected Message Delivery Accomplished
	Protected Message Delivery Failed
	Successful Outgoing Protected Message
	Failed Outgoing Protected Message

4.3.3
Call-Out (CO) Box

CO Box contains incoming and outgoing Call-Out messages.

Clicking **Select** on a Call-Out message headline displays more detailed information on the item.

When the radio is in normal mode, you are able to browse through all messages in the **CO Box**. However, if the radio is in the Call-Out mode, you can only browse through the information regarding the currently ongoing Call-Out message.

> **NOTE:** When configured, Call-Out Box can be accessed from the main menu.

4.3.3.1
Call-Out Icons

Table 12: Call-Out Icons

Icon	Description
	Read (Old) Call-Out Message in Inbox
	Unread (New) Call-Out Message in Inbox
	Read (Old) Protected Call-Out Message in Inbox
	Unread (New) Protected Call-Out Message in Inbox
	Read (Old) Call-Out Message in Outbox
	Read (Old) Protected Call-Out Message in Outbox

Icon	Description
✉	New Unread Call-Out – Indicates the new message in other user profiles. The number on the icon represents the user profile with unread messages.

4.3.4
Templates

A template box stores user-defined message templates.

4.3.4.1
Sending User-Defined Templates

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Messages** → **Templates**.

4.3.4.2
Managing User-Defined Templates

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Messages** → **Templates**.

4.3.5
Predefined Templates

Predefined message templates are programmed into your radio.

4.3.5.1
Viewing Predefined Templates

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Messages** → **Predefined**.

4.3.5.2
Sending Predefined Templates

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Messages** → **Predefined**.

3. Highlight the required template and do one of the following:

   ● Select **Send**

- Press the **Send** key

4.3.6
Status Messages

The radio allows you to send statuses. Statuses can be sent to the Individual Short Subscriber Identity (ISSI) of the dispatcher that is configured in the user profile.

4.3.6.1
Viewing a Status Message Number

Procedure:

1. From the home screen, press the **Menu** key.
2. Select **Messages → Send Status**.

4.3.6.2
Sending Status Messages

You can send status messages to either a selected talkgroup or a programmed private number. Only one option can be enabled at a time.

Prerequisites:

- If sending statuses to talkgroups is enabled, switch to the talkgroup to which you want to send a status message.
- If sending statuses to private numbers is enabled, no action is needed. The private number is set up by your service provider.

Procedure:

1. From the home screen, press the **Menu** key.
2. Select **Messages → Send Status**.
3. Highlight the required status message and do one of the following:
   - Press **Select**.
   - Press the **Send** key.

4.3.7
Call-Out Availability

📝 **NOTE:** This feature is only available when enabled by your service provider.

This menu item enables or disables the Call-Out availability.

4.3.7.1
Setting Call-Out Availability

Procedure:

1. From the home screen, press the **Menu** key.
2. Select **Messages → Call-Out Availability**.

3. Select one of the following options:

- **Available**
- **Not available**

4.4
Man Down (Fall Alert)

📝 **NOTE:** This is a Software Selling Feature.

Man Down (henceforth known as Fall Alert) alerts when no movement is detected for a predefined time interval.

If this condition is met, the radio alerts you with a Man Down (Fall Alert) pre-alert. If you do not disable the pre-alert condition by moving the radio, the radio switches to the Emergency Operation.

🔷 **IMPORTANT:** If you receive a call out while pre-alert condition is active, exit from call out to Home screen before disabling the Man Down (Fall Alert) pre-alert condition.

If the radio is connected to the Home Station, Man Down (Fall Alert) pre-alert and alert are not triggered.

For easier localization of the radio, visual and audible indications are started until they are deactivated.

To exit Man Down (Fall Alert), exit the Emergency Mode by pressing and holding the **Exit** soft key.

⚠️ **CAUTION:** Use only Motorola Solutions predefined tones when Man Down (Fall Alert) is activated.

4.4.1
Setting Man Down (Fall Alert)

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Man Down** (henceforth known as Fall Alert).

3. Select one of the following options:

- **On** – Activates the feature.
- **Off** – Deactivates the feature.

4.5
Security

Security menu stores all your security settings.

4.5.1
PIN Protect

This feature allows you to enable/disable PIN code authentication at the next power on. This code protects your radio against unauthorized use.

📝 **NOTE:** Customers are strongly advised to change the default PIN code in order to protect devices from unauthorized access.

📝 **NOTE:**
If the radio uses a BSI PIN code and you are unable to unlock the radio, you cannot take any action.

4.5.1.1
Protecting the Radio with a PIN Code

Procedure:

1. Select **Security** → **PIN Protect**.

2. Select **On**.

3. Enter the PIN code.

   📝 **NOTE:**
   To increase security, set your own PIN code. By default the PIN code are all zeros (depending on the length of the PIN code). For radios with general PIN authentication, the PIN length is a fixed 4-digit code. For radios with BSI PIN authentication, the PIN length is configurable by your service provider up to a maximum of 8-digit code.

Postrequisites: Each time you turn on the terminal, PIN code is required.

4.5.1.2
Changing PIN Codes

📝 **NOTE:** This feature is only available when enabled by your service provider.

Procedure:

1. Select **Security** → **Change Code**.

2. Radio prompts for the `Old Code`.

   📝 **NOTE:**
   To increase security, set your own PIN code. By default the PIN code are all zeros (depending on the length of the PIN code). For radios with general PIN authentication, the PIN length is a fixed 4-digit code. For radios with BSI PIN authentication, the PIN length is configurable by your service provider up to a maximum of 8-digit code.

3. If the entered code matches the old code, radio prompts for the new code twice.

Result: Your radio displays `Code Accepted`.

4.5.2
Setting Keypad Lock

The keypad lock/unlock can be invoked from the radio menu, or by using a predefined menu shortcut.

By default, the **Power** and **Emergency** buttons are always operative when the keypad is locked.

Procedure:

1. To unlock, perform one of the following actions:

   - Press the **Power/Sleep/Wake** button.

2. To lock, press **Menu** and select **Security** → **Keylock Setup** → **Lock Keypad**.

4.5.2.1
Setting Automatic Keylock Delay

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Security** → **Keylock Setup** → **Delay**.

3. Press **Select** to change the minutes and press **Done**.

4.5.2.2
Setting Keylock on Startup

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Security** → **Keylock Setup** → **Start Locked**.

3. Select **On** or **Off**.

4.5.3
Air Encryption

NOTE: This is a Software Selling Feature.

This menu item allows you only to view air encryption state.

Air Encryption is a feature that enables encryption of entire communication between the radio and infrastructure, which results in increased security of calls, messages, and data.

In the TMO Mode, when Air Encryption is enabled on your radio but cannot be supported due to an infrastructure failure, the following icon appears on the display: . When encryption is not available in the DMO Mode, the radio displays: .

4.5.3.1
Viewing Air Encryption State

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Security** → **AirEncrypt**.

   Your radio displays:

   - `Air Encryption Is Off` – The Air Encryption is not activated.
   - `Air Encryption Is On` – The Air Encryption is activated.

4.5.4
K Validity

Key (K) is a secret key the infrastructure uses to authenticate the radio in the system. It is part of the authentication that provides service confidentiality between your radio and the system.

4.5.4.1
Verifying K Validity

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Security → K Validity**.

   Your radio displays:

   - `K is Valid` — The infrastructure can authenticate your radio.

   - `K is Invalid` — The infrastructure is unable to authenticate your radio. Please call your service provider to restore the key to your radio.

4.5.5
SCK (Air Interface Encryption Class 2)

Static Cipher Key (SCK) is a secret key used for the Air Interface Encryption Class 2. It may be used to encrypt calls and data in TMO and DMO.

The SCK air interface encryption provides service confidentiality between radios and infrastructure when in TMO, and between radios when in DMO. A radio is capable of being loaded with up to 32 SCKs. Specific keys are used for encrypting the air interface.

Any mismatch between radios and/or infrastructure impacts communication – only those using the same key as the transmitting party are able to decode and hear the communication.

4.5.5.1
TMO SCK

Your service provider can enable SCKs in TMO. The SCKs used in TMO are called TMSCKs.

4.5.5.1.1
Verifying TMSCK Validity

When and where to use: To ensure that the TMSCKs in the radio are valid and can be used for the air interface encryption.

Procedure:
1. From the home screen, press the **Menu** key.
2. Select **Security → TMSCK Validity**.

   The radio displays:

   - `TMSCK is Valid` — The radio can work encrypted in TMO.

   - `TMSCK is Invalid` — The radio cannot work encrypted in TMO. Please contact your service provider to restore SCKs to your radio.

4.5.5.2
DMO SCK

Your service provider can enable SCKs in DMO. The SCKs used in DMO are called DMSCKs.

4.5.5.2.1
Verifying DMSCK Validity

When and where to use: To ensure that the DMSCKs in the radio are valid and can be used for the air interface encryption.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Security → DMSCK Validity**.

   The radio displays:

   - `DMSCK is Valid` – The radio can work encrypted in DMO.

   - `DMSCK is Invalid` – The radio cannot work encrypted in DMO. Please contact your service provider to restore SCKs to your radio.

4.5.5.3
Changing DMO SCK

⚠ **IMPORTANT:** Changing this setting may cause radios not to operate correctly.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Security → DMO SCK**.

3. Press **Next**.

4. Radio displays `Change to version`.

5. Select one of the following options:

   - **Yes** – To change the key. Your radio displays `Key version changed`.

   - **No** – To leave the key. Your radio displays `Code Not Changed`.

4.5.6
Covert Mode

This feature enables you to completely shut down all visible and audible alerts and notifications, making your radio unnoticeable even in a silent and dark environment.

All audio activities are suppressed to the built-in speaker and mic, and the audio is routed to and from the accessory only.

When your radio is in the Covert Mode, you cannot enter the following menu items of the Setup menu.

- **Set Volume**

- **Tones**

- **Backlight** (in Display menu item)

Your radio turns on in the mode set before turning off. If Covert Mode is enabled before turning off, your radio turns on in Covert Mode.

When Covert Mode is turned off, all the changed settings are reverted to the previous state.

This feature can be used as a One-Touch Button.

4.5.6.1
Activating Covert Mode

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Security → Covert Mode**.

3. Select one of the following options:

    ● **On** – All tones are set to off, and the backlight and the LED are disabled immediately. The group audio is routed to the earpiece. The radio displays `Covert Mode On`.

    ● **Off** – All settings for tones, backlight and audio are restored. The radio displays `Covert Mode Off`.

4.5.7
Remote Control

There are two types of remote control, Short Data Service (SDS) Remote Control and Status Remote Control.

4.5.7.1
Status Remote Control

Status Remote Control is a feature that provides limited control of the radio, unlike Short Data Service (SDS) Remote Control.

Only one type of remote control can be active on a radio; either SDS or Status.

The following tasks can be assigned remotely to a radio:

Play loud tone until user interaction
The radio plays a loud tone as in the Man Down (henceforth known as Fall Alert) feature until you unlock the keypad (if needed) and press the appropriate soft key labeled **Exit**. The tone is played through the speaker even if an accessory is attached.

The tone is not emitted when the radio is in one of the following states:

● Temporarily disabled

● Pseudo Off Mode

● Ambience Listening Mode

● Transmit Inhibit Mode (TXI)

● Emergency Mode

Send firmware version and TEI
The radio sends back an SDS message with its firmware version and TEI.

> **NOTE:** If the sending Individual Short Subscriber Identity (ISSI) is not on the Allowed ISSIs list, the receiving radio ignores the task.

4.5.7.2
SDS Remote Control

> **NOTE:** This is a Software Selling Feature. Only one type of remote control can be active on a radio; either SDS or Status.

SDS Remote Control is a feature that enables remote control and configuration of the radio using special SDS messages. The messages can be sent both in TMO and DMO by any radio capable of controlling other radios. During the execution of the Remote Control messages, depending on your service provider settings, the radio can play a tone, vibrate, or display an appropriate icon in the status icon area.

4.5.7.3
Setting Remote Control

This procedure describes how to toggle remote control.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Security → Remote Control**.

3. Select **On** to enable, or **Off** to disable remote control.

4.6
Setup

The Setup menu allows you to change the general configuration on your radio.

4.6.1
Vibrate

This sub-menu allows you to determine if your radio vibrates, or rings, or vibrates and then rings when receiving a message.

> **NOTE:** There are five different assignable vibration patterns. Contact your service provider to customize the vibration patterns for your user profiles.

4.6.1.1
Setting Default Vibrate

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Vibrate**.

3. Select one of the following options:

   - **Vibe then Ring**
   - **Vibe Only**
   - **Ring Only**

4.6.2
Set Volume

This menu item allows you to adjust the tone volumes.

4.6.2.1
Setting Volume

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Set Volume**.

3. Press **Select** key to change the value.

4.6.3
Language

This sub-menu allows you to change the language of the radio.

4.6.3.1
Setting Language

Prerequisites: The list of available languages is set by service provider.

Procedure:

1. From the home screen, press the **Menu/OK** key.

2. Select **Setup → Language**.

3. Select desired language.

4.6.4
Audio

This menu item allows you to adjust your radio audio settings.

4.6.4.1
Audio Profiles

Your service provider can configure a maximum of four audio profiles.

For a detailed description of a specific audio profile, contact your service provider.

4.6.4.1.1
Setting Audio Profiles

This feature allows you to adjust the audio parameters of your radio in its current operating environment.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Audio → Audio Profile**.

3. Select a required profile.

4.6.5
Tones

This field allows you to activate or deactivate the tones set.

> **NOTE:** The radio has two tone packs: Classic Tones (default) and New Tones. Your service provider decides which tone pack is enabled.

4.6.5.1
Keypad Tone

You can activate/deactivate keypad tone at every key press.

4.6.5.1.1
Setting Keypad Tone

Procedure:

1. From the home screen, press the **Menu** key.
2. Select **Setup → Tones → Keypad Tone**.
3. Select one of the following options:
   - **On** – Activates keypad tone.
   - **Off** – Deactivate keypad tone.

4.6.5.2
All Tones

You can activate/deactivate all tones.

4.6.5.2.1
Setting All Tones

Procedure:

1. From the home screen, press the **Menu** key.
2. Select **Setup → Tones → All Tones**.
3. Select one of the following options:
   - **On** – Activates all the tones.
   - **Off** – Deactivate all the tones.

4.6.5.3
User Imported Tones

You can import up to eight .wav files as new alert tones, and also remove the imported tones through CPS. For more information about User Imported Tones and CPS, contact your service provider.

4.6.6
Display

This menu item allows you to adjust your radio display settings.

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4.6.6.1
Setting Font Level

When and where to use: To increase or decrease text size so you can adjust the interface readability to existing conditions.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Display → Font Level**.

3. Select one of the following options:

   - **Level 1** – Tiny

   - **Level 2** – Small

   - **Level 3** – Medium

   - **Level 4** – Large

   In some languages, the number of available font levels can be decreased.

4.6.6.2
Setting Large Idle Font

When and where to use: To enable/disable large font on the home screen.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Display → Large Idle Font**.

3. Select **On** to enable, or **Off** to disable displaying large font on the home screen.

   > NOTE: Large Idle Font is not available in some languages.

4.6.6.3
Setting Screen Saver

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Display → Screen Saver**.

3. Select one of the following options:

   - **Activate** – To activate or deactivate this feature. The real-time clock is displayed when the screen saver is active. Select one of the following sub-options:

     ○ **Auto** – Automatically displays the screen saver when the radio is inactive for a pre-determined period.

     ○ **Disabled** – Disables the screen saver.

   - **Text** – To set the text on the screen saver when this feature is activated.

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4.6.6.4
Setting Backlight

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup** → **Display** → **Backlight**.

3. Select one of the following options:

    - **Auto** – Backlight is triggered by turning on the radio, by pressing any key on the device or on the accessory that is connected to it. Also charging or getting signal from the services like: Call-Out message, RUA request, DGNA, and new SDS messages are going to turn on the backlight.

    - **Semi Auto** – Backlight is turned on when you are switching on the radio, pressing assigned button to the backlight feature, or charging.

4.6.6.5
Setting Brightness

When and where to use: To set the luminance of the display and the keypad in an environment with low visibility.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup** → **Display** → **Brightness**.

3. Select one of the following options:

    - **Level** – Allows you to manually set the brightness level using the **Up** or **Down** Navigation key.

    - **Automatic** – Enables or disables the automatic brightness mode, in which the radio uses a photo sensor to automatically adjusts brightness to the ambient light. However, it is still possible to adjust brightness using the **Up** or **Down** Navigation key in the Level menu.

4.6.6.6
Setting Wallpaper

When and where to use: To change the look of the home screen.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup** → **Display** → **Wallpaper**.

3. Select one of the following options:

    - **On** – To activate this feature.

    - **Off** – To deactivate this feature.

4.6.6.7
Setting Home Station Idle LED

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Display → Home Station Idle LED**

3. Select one of the following options:

- **Enable** – Activates Idle LED while in the Home Station.

- **Off** – Deactivates Idle LED while in the Home Station.

4.6.6.8
Setting Idle LED

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Display → Idle LED**

3. Select one of the following options:

- **Enable** – Activates Idle LED.

- **Off** – Deactivates Idle LED.

4.6.7
Time and Date

This sub-menu controls the displayed time and date on the home screen.

> **NOTE:** If the Home Display Text Message feature is enabled, Home Mode Display Text may cover time and date, depending on the Configurable Idle Screen settings. Infrastructure synchronizes the time and date. When not within the infrastructure signal range you can set the values manually.

4.6.7.1
Setting the Time Manually

When and where to use: If the time cannot update automatically through the infrastructure.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Time & Date → Set Time**.

3. Enter current time using Navigation keys.

   Press **Menu** to switch between values.

4. Press **Done**.

4.6.7.2
Setting the Date Manually

When and where to use: If the date cannot update automatically through the infrastructure.

Procedure:

1. From the home screen, press the **Menu** key.

2. From the home screen, press the **Menu/OK** key.

3. Select **Setup → Time & Date → Set Date**.

4. Enter current date using Navigation keys.

Press **Menu** to switch between values.

5. Press **Done**.

4.6.7.3
Setting Time Offset

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Time & Date → Time Offset**.

3. Enter time offset using Navigation keys.

   📝 **NOTE:** You can adjust the offset value, with 15 minute steps, up to 14 hours ahead or behind.

4. Press **Done**.

4.6.8
Energy Economy

Energy Economy (EE) is a mode of operation to save battery life. Your radio does not monitor all downlink time slots of the Main Control Channel. If the radio is in the charger, Energy Economy mode is not needed.

4.6.8.1
Enabling or Disabling Energy Economy

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Energy Economy**

3. Select one of the following options:

   ● **On** – Activates Energy Economy feature.

   ● **Off** – Deactivates Energy Economy feature.

4.6.9
Transmission Power Class

📝 **NOTE:** This is a Software Selling Feature.

Transmission Power feature enables your radio to choose whether to transmit with Class 3L or Class 4. The RF Power icon indicates when the radio uses this feature.

4.6.9.1
Selecting RF Power

When and where to use: Use this procedure when you are entering the area that requires higher signal strength.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → RF Power**.

3. Select one of the following options:

   ● **Hi RF Power** – Activates this feature.

   ● **Normal RF Pwr** – Deactivates this feature.

   ✎ **NOTE:**

   ● Battery consumption is higher when **Hi RF Power** is selected.

4.6.10
User Profiles

This menu item allows you to select a predefined user profile.

4.6.10.1
Selecting User Profiles

Prior to any configuration, the first user profile is selected by default.

When and where to use:

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → UserProfile**.

Result: A list of user profile aliases is displayed.
Upon profile selection, the radio is attached to a specified Trunked Mode Operation or Direct Mode Operation talkgroup with a predefined volume settings, operation mode, and refreshed with the status area icon displaying the index of the selected user profile.

4.6.11
Default Setting

This sub-menu item resets the radio back to default settings.

4.6.11.1
Selecting Default Setting

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Def. Settings**.

   Your radio display `Reset to def. settings?`. Press **Yes** to confirm.

4.6.12
Speech Announcements

Speech Announcement is a pre-recorded message playback when your radio receives a Call-Out message.

✎ **NOTE:** This is a Software Selling Feature.

4.6.12.1
Setting Speech Announcement

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup** → **Speech Announcement**.

3. Select one of the following options:
   - **Mode** – allows you to configure your radio to tone only, tone then speech, or speech only mode.
   - **Play All Alert Loops** – allows you to configure your radio to play the second or third fixed audio, and the remaining received alert loops audio.

4.6.13
Periodic Notice

Procedure:

1. When there is link failure or a missing talkgroup, select one of the following options:
   - **OK** – Suppress notification until next availability.
   - **Snooze** – Suppress notification for as long as the duration that is set.

2. When no service is available or unit is not attached, select one of the following options:
   - **Always** – Always show periodic notification.
   - **Ask** – Show periodic notification when you select **OK** or **Snooze**.
   - **Never** - Never show periodic notification.

4.6.14
Low Battery

This menu item allows you to adjust low battery settings.

4.6.14.1
Setting Low Battery Screen

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup** → **Low Battery** → **Low Battery Screen**.

4.6.14.2
Setting Suppression Period

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup** → **Low Battery** → **Suppression Period**.

4.6.15
Call Out

This submenu item allows you to set the duration of the Call-Out Reminder Alerting Period.

4.6.15.1
Setting Reminder Alert Period

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Setup → Call Out → Reminder Alert Period**

    📝 **NOTE:** You can only select 0, 1, 2, 5, 10, 20, 30, 40, 50, and 60 minutes by using the menu. If you select a different value in the configuration tool, the value displays in the menu. But you cannot select the value again after your radio select the value available in the menu.

4.7
My Info

This sub-menu allows you to view your own private, phone, and radio info.

4.7.1
Viewing Personal Information

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **My Info**.

3. Select one of the following options:

    ● **My Private Num** – displays your radio private number.

    ● **My Phone Num** – displays your radio phone number.

    ● **Radio Info** – displays radio information: manufacturer, product type, ISSI, TEI, Serial Number, OPTA and Birth OPTA.

        📝 **NOTE:** OPTA information is optional.

    ● **Battery Info** – displays battery charge in %.

    ● **Storage Info** – displays the amount of free and total space available in the internal radio memory.

    ● **Talkgroup** – displays the Talkgroup alias if configured, and the attachment status of each Talkgroup in the current user profile.

    ● **Radio Info** – displays the 59-character comments configured in CPS.

4.8
Shortcuts

This sub-menu allows you to set up shortcuts to access frequently used menu items.

4.8.1
Creating Menu Shortcuts

When and where to use: To assign a shortcut for the menu item.

Procedure:

1. From the home screen, press the **Menu** key.

2. Scroll to the item you want as a shortcut.

3. Press and hold **Mute/Shortcut** when the item is highlighted.

Example:

Creating a shortcut to the **All Tones** options.

1. From the home screen, press the **Menu** key.

2. Select **Setup** → **Tones**.

3. Highlight **All Tones** and press and hold **Mute/Shortcut** until `Assign Shortcut for: All Tones` is displayed.

4. Select **Yes** and `Shortcuts Assigned` is displayed.

> **NOTE:** To use this shortcut, from the home screen, press **Menu** → **Shortcuts** and select the shortcut from the list.

4.8.2
Editing Menu Shortcut Lists

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Shortcuts**.

3. Highlight a required shortcut and press **Menu**.

4. Select one of the following options:

   - **Delete** – Erases highlighted shortcut. Select **Yes** to confirm.
   - **Delete All** – Erases all the shortcuts. Select **Yes** to confirm.

4.9
Networks

This menu item allows you to switch between the radio operation modes.

4.9.1
Network Select

This sub-menu item allows you to select a network to register your radio. **Network Sel** is available only in TMO or Gateway mode, otherwise your radio display `Service Restricted` message.

4.9.1.1
Selecting Your Network

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Networks → Network Sel → Home Only**.

   Your radio registers to the home network.

4.9.1.2
Using Select Net Registration

When and where to use: Use this feature to migrate to another predefined network when you are out of the range of your network and your radio displays the `No Service` message.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Networks → Network Sel → Select Net**.

3. Select the required network from the list.

Result: Your radio registers to the selected network.

4.9.1.3
Using Any Network Registration

When and where to use: Your radio has lost its home network coverage and wants to increase the number of networks it can scan and register.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Networks → Network Sel → Any Network**.

   Your radio selects and registers to the network automatically from the predefined list.

4.9.2
DMO Configuration

Procedure:

1. Select **Networks** → **DMO Config**.

2. Select one of the following options:
   - **MS - MS** – Your radio can communicate only with other radios within its range.
   - **Gateway** – Your radio uses a gateway to communicate with the infrastructure.
   - **Repeater** – Uses the first available repeater for that talkgroup.
   - **Gateway and Repeater** – Uses the first available gateway or repeater for that talkgroup.

4.9.3
Selecting Network Operation Mode

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Networks**.

3. Select one of the following options:
   - **Network Sel** – Selects the network to which the radio is allowed to register.
   - **Trunked Mode** – Switches to the mode using infrastructure.
   - **Direct Mode** – Switches to the mode without using infrastructure.
   - **DMO Config** – Only available in Direct Mode. See .
   - **TXI Mode** – Select **Activate** to stop sending any radio transmission.

     NOTE: If the radio is in **TXI Mode**, it is not possible to switch from **Direct Mode** to **Trunked Mode**.

   - **Periodic Notice** – Suppression of notification when link failure or missing group attachment. See .

4.10
Location

NOTE: This is a Software Selling Feature.

This sub-menu allows you to enable the GPS, change GPS accuracy, and view your position and testpage.

See

4.10.1
Enabling GNSS

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Location** → **Interface**.

3. Select **On**.

> NOTE: Your service provider can enable this feature.

4.10.2
Viewing Your Position

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Location → Position**.

4.10.3
Viewing Testpage

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Location → Testpage**.

3. Select one of the following options:

   - **Position** – Displays detailed information on your radio current position: time, **N** (latitude), **E** (longitude), **H** (height), **Sats Used** (a number of tracked satellites), **B** (bearing), **HS** (horizontal speed), **LC** (level of confidence).

   - **Power** – Displays detailed information on a particular satellite: **PRN** code, **Status**, **Mode**, **C/N** (carrier-to-noise ratio).

   - **Version** – Displays detailed information on software version: **SW** (software version), **HW** (hardware version), **ASIC** (application-specific integrated circuit), **RC** (release code).

4.10.4
Changing GPS Accuracy

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Location → Accuracy**.

3. Select one of the following options:

   - **Medium** (default) – Power consumption optimization is combined with less position accuracy.

   - **High** – Better position accuracy is combined with less power consumption optimization.

Backlog

This sub-menu allows you to enable/disable, view, and delete backlog reports.

NOTE: The location report backlog is only available when Local Information Protocol (LIP) is enabled.

4.10.5.1
Enabling or Disabling Backlog

Procedure:

1. From the home screen, press the **Menu** key.
2. Select **Location** → **Backlog** → **Enablement**.
3. Select one of the following options:
   - **On** – Activates location report backlog recording.
   - **Off** – Deactivates location report backlog recording.

4.10.5.2
Viewing Backlog Reports

Procedure:

1. From the home screen, press the **Menu** key.
2. Select **Location** → **Backlog** → **Reports**.

   The radio displays the number of backlog reports stored.

4.10.5.3
Deleting All Backlog Reports

Procedure:

1. From the home screen, press the **Menu** key.
2. Select **Location** → **Backlog** → **Delete All**.

4.11
Crypto Menu

This sub-menu allows you to manage SIM card based End-to-End Encryption.

The End-to-End Encryption is used for:

- Encryption of messages transmission in the TMO Mode.
- Encryption of messages transmission in the DMO Mode.
- Encryption of position data (GPS) transmission in the TMO and DMO Modes.
- Management of encryption keys in the TMO Mode.

4.11.1
Updating Encryption Keys

When and where to use: The Updating Encryption Keys menu is used to update old or incorrect encryption keys.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Crypto Menu → Upd Encr Keys**.

3. Select **Upd Group Key** to start the update.

   NOTE: You can update the encryption keys if the End-to-End Encryption is enabled. The keys cannot be updated when the radio is in Direct Mode Operation (DMO).

4.11.2
Viewing OPTA

When and where to use: The **Show OPTA** menu is used to view Operational Tactical Address (OPTA) that provides supplementary information about the organization and operational role of a radio.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Crypto Menu → Show OPTA**.

4.11.3
Setting OPTA Filter

When and where to use: Use this menu item to define which characters are masked when the OPTA name is displayed.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Crypto Menu → OPTA Filter**.

3. Highlight check boxes using the Navigation keys and press **Select** to set which characters are masked when the OPTA name is displayed.

4. Press **Done** to confirm the changes.

4.11.4
Starting Crypto Registration

Prerequisites: Ensure that your radio is not in Direct Mode Operation (DMO).

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Crypto Menu → Crypto Registr**.

3. Select **Start Registr** to start the registration.

4.11.5
Setting DMO Encryption Mode

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Crypto Menu → DMO Encr Mode**.

3. Enable the required mode by selecting one of the following options:
   - For crypto mode bit 1, select **DMO 1**.
   - For crypto mode bit 2, select **DMO 2**.

4.11.6
Setting Encryption Keys for SDS Messages

The SDS Encryption Mode menu is used to set encryption keys for group and individual SDS messages.

Procedure:

1. From the home screen, press the **Menu** key.

2. Select **Crypto Menu → SDS Encr Mode**.

3. Select one of the following options:
   - **Individual SDS**
   - **Group SDS**

4. Select one of the following options:
   - **Global Key**
   - **Group Key**

Chapter 5

Features

5.1
Call-Out

📝 **NOTE:** This is a Software Selling Feature.
For those who use DMO mode, you are recommended to apply DMO SCK for data confidentiality.

This feature allows you to receive Call-Out alerts. On receiving the Call-Out messages, the radio interrupts current services and attends to the Call-Out alert without any further delay. After the Call-Out is cleared by the dispatcher, the radio exits Call-Out mode and reverts to normal mode.

The following items are configurable in the Call-Out screen, when accessing the Call-Out message from the Call-Out Box.

● Severity

● Talkgroup alias

● TXI indication

● Text

● Timestamp

● Originating ISSI

● Triggering subaddress alias or Configurable Text for Individual Callout

● All matching subaddresses alias

● Call-out number

The time-stamp on the Call-Out alert indicates the time and date when the Call-Out is received.

To read an entire Call-Out message, scroll down the screen by pressing the **Down** Navigation key. The length of the message is indicated by the vertical bar on the left of the screen.

Figure 14: Call-Out Message
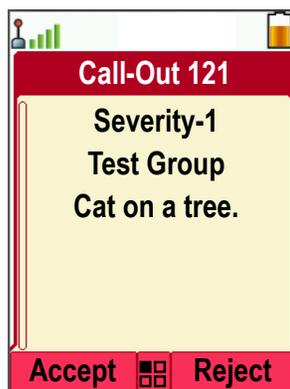
📝 **NOTE:** Message protection functionality is enabled in the Inbox and Call Out Inbox. Users can only delete unprotected messages.

5.1.1
Types of Call-Out Alerts

There are four types of the Call-Out alerts:

Normal Call-Out

An alert message that is sent by a dispatcher either to a single radio or to a group of radios. There are two types of Normal Call-Out:

With user receipt

The radio gets to the Accepted phase when you:

- select **Accept**, **Reject**, or **Standby**.

- the acknowledgment timer runs out.

Without user receipt

The radio gets to the Accepted phase when you:

- press **Menu** or any key.

- the acknowledgment timer runs out.

The Normal Call-Out mode is ended when the validity timer runs out.

Storm Plan

An alert message that is sent by a dispatcher to a group of radios. To raise its reliability, it is sent several times. You are not able to respond to the Call-Out alert and any key press takes you to the information phase.

The Call-Out mode is ended when one of the following scenarios occur:

- the acknowledgment timer runs out.

- you press any key, except for the **Emergency** button.

- you press the **Messages** and **Exit** softkeys.

Simple Call-Out

An alert with the functionality similar to full Call-Out but without the information phase. There are two types of Simple Call-Out:

With user receipt

The Call-Out mode is ended when the acknowledgment timer runs out, or when you select **Accept**, **Reject**, **Standby**, or reply with a predefined text message.

Without user receipt

The Call-Out mode is ended when one of the following scenarios occur:

- the acknowledgment timer runs out.

- you press any key, except for the **Emergency** button.

- you press the **Messages** and **Exit** softkeys.

Test Call-Out

A special Call-Out alert that is sent by the dispatcher to test this feature. On receiving the Test Call-Out, the radio plays a tone and displays `Test Call-Out`. To respond and clear the alert, press the **Test OK** Soft key.

5.1.2
Call-Out Modes Interaction

Call-Out feature operation is different in other modes:

Transmit Inhibit (TXI) Mode

You can receive Call-Out messages. The Call-Out alert message is displayed on the screen. You have the option to exit TXI Mode or exit the Call-Out prompt.

- Exit TXI – Your radio exits TXI mode and prompts you to accept or reject the Call-Out message.

- Exit Call-Out – Your radio exits the Call-Out message and returns to TXI mode.

Trunked Mode Operation (TMO)
Call-Out is supported.

Direct Mode Operation (DMO)
Call-Out is supported.

Emergency Mode
All Call-out alerts are ignored.

GSDM Mode
Call-Out is supported.

5.1.3
Call-Out Service Phases

The following items are configurable in the Call-Out screen, when accessing the Call-Out message from the Call-Out Box.

- Severity

- Talkgroup alias

- TXI indication (only used in TXI mode, to display "TXI mode" text)

- Text

- Timestamp

- Originating ISSI

- Triggering subaddress alias or Configurable Text for Individual Callout

- All matching subaddresses alias

- Call-out number

In the Call-Out mode, there are the following phases:
Alert Phase
Alerting users by using the LED pattern, vibration pattern, alert tone, and volume level configured for each matching subaddress that contains the indication profile setting. The indication profile for each subaddress is played in sequence. The conditions for the duration of the indication and intervals in between each indication are configured in the codeplug. A reminder indication starts when the entire sequence of indication is completed (if not stopped before).

The radio receives a Call-Out message. An alarm tone indicates the message. When the text is displayed, you have the following options:

- **Accept**

- **Reject**

- **Menu**

  NOTE: This feature is only available when enabled by your service provider. If this feature is not enabled by the service provider, an alarm tone sounds to indicate the received message.

Information Phase
You are still in the Call-Out mode and you can receive more detailed information about the incident that occurred through a subsequent text message. You can query for more information using the Call-Out text function, which enables you to send a predefined text message.

Call-Out Reminder Phase
Your radio enters the Call-Out Reminder Phase after Alert Phase.

Call-Out Reminder Phase indicator:

- Reminder tone.

    NOTE: You can configure the Call-Out Reminder tone that is set.

- Reminder Vibration

- LED Reminder - Blue.

- LCD backlight flashing reminder.

The Call-Out reminder indication stays active for the duration of the Call-Out Reminder Alerting Period. Pressing any key shall dismiss the reminder indication.

Select **Setup → Call Out → Reminder Alert Period** to set the duration of Call-Out Reminder Alerting Period.

NOTE: You can only select 0, 1, 2, 5, 10, 20, 30, 40, 50, and 60 minutes by using the menu. If you select a different value in the configuration tool, the value displays in the menu. But you cannot select the value again after your radio select the value available in the menu.

The radio will display the Call-Out reminder phase with the following options:

- **Messages**, or

- **Exit**.

NOTE: You can choose to dismiss the reminder phase instead of reading the missed Call-Out message. A message is considered read if a user responded while the message is considered unread if no response from the user.

You are allowed to configure the interval and duration parameters for the unread Call-Out reminder, per user profile.

You are able to respond to a Call-Out by using a pre-coded message selected from a list of predefined replies.

5.2
GPS Location Service

NOTE: This is a Software Selling Feature.

The Global Positioning System (GPS) Location Service feature uses information from GPS satellites orbiting the Earth to determine the approximate geographical location of your radio.

The GPS Location Service availability, accuracy, and the position calculation time vary depending on the environment in which you use the radio. The GPS Location Service can assist your dispatcher or colleagues in many ways. For example, deploying of resources more efficiently or locating your radio when you trigger your emergency service.

The radio can display the location information directly on the screen or send it over the air to your dispatcher to display it in the control center. Check your radio configuration details with your service provider.

IMPORTANT:
Where the signals from satellites are not available, the GPS Location Service does not work. This usually happens when your radio cannot establish a view of a wide area of open sky. An example would be when the GPS antenna is covered or facing the ground. Such situations include being:

- In underground locations

- Inside buildings, trains, or other covered vehicles

- Under any other metal or concrete roof or structure

- Near a powerful radio or television tower

- In extreme temperature outside the operating limits of your radio

Even if your location information can be calculated in such situations, it may take longer to do so. Therefore, in any emergency situation, always report your location to your dispatcher. Where adequate signals from multiple satellites are available, your GPS Location Service feature provides a location, most probably near to your actual location.

The radio can be triggered to send Location Reports in various circumstances, for example:

- Upon a request

- Entering Emergency Mode

- At specified time intervals

- At specified distance intervals

NOTE: LIP Triggers can be configured for TMO only, DMO only, or both modes at the same time.

The Location Reports can be sent both in Trunked Mode Operation (TMO) and Direct Mode Operation (DMO) by using:

- Short Data Service (SDS) messages

- Packet Data (in TMO mode only, with Packet Data enabled on the network by the service provider)

The radio can be configured to give audio-visual notifications upon sending the Location Reports.

Depending on the radio settings, viewing the radio position and the status of the visible satellites is available. The position may consist of longitude and latitude, UK, or Irish grid coordinates.

5.2.1
Enhance GPS Performance

Sometimes the GPS feature is unable to complete a location calculation successfully. You hear an audible tone indicating that your radio cannot see the satellites.

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

- Stay in the open – The GPS feature works best where there is nothing between your radio and a large amount of open sky. If possible, go outside, away from tall buildings and foliage. While the performance in a building is improved by moving closer to windows, glass with certain sun shielding films may block satellite signals.

- Position your radio to enhance reception – Signals from GPS satellites are transmitted to your GPS antenna, which is in your radio antenna. Hold your radio away from your body, giving the antenna clear access to satellite signals. Do not cover the antenna area with your fingers or anything else.

● Stand still – If possible, stand still until your radio is finished determining your location. Moving your radio at a walking pace while your radio is calculating your approximate location may substantially decrease GPS performance.

This feature works best where there is nothing between your radio and a large amount of open sky. To maximize the ability of your radio to determine a location fix, avoid closed space, tall buildings, and foliage. If possible, do not use this feature in underground parking lots, tunnels, under bridges, and close to high buildings.

5.2.2
Location Report Backlog

Your radio can record location track when it is out of service, when in DMO, or when in TXI mode.

The location reports generated during this time are stored, and all location report backlog recordings are uploaded once your radio is back in service. Your radio can save up to a maximum of 180 location reports. The location report backlog function differently when in different mode:

Location Backlog Recording in Trunked Mode Operation (TMO)
Your radio starts recording location reports when radio is out of service in TMO Mode.

Your radio resumes the latest location reporting when TMO coverage is regained.

Location Backlog Recording in Direct Mode Operation (DMO)
Your radio starts recording location reports in DMO Mode.

Your radio resumes the latest location reporting when it switches back to TMO mode.

> **NOTE:** This feature is only available when enabled by your service provider.

Location Backlog Recording in Transmit Inhibit Mode (TXI)
When your radio is in TXI mode, location reports are generated and recorded but not sent out.

Once your radio exits TXI mode and is within TMO coverage, the location reports are uploaded to the server.

5.2.3
GPS Icon

When GPS is enabled, the following icon is displayed in the status icon area: .

Depending on the current GPS state, the icon can be solid – GPS has a fix, or blinking – GPS is searching for a fix. The blinking GPS icon can be disabled/enabled by your service provider.

5.2.4
Different Location Displays

Table 13: Different Location Displays

Latitude/Longi-tude	UK Coordinates	Irish Coordi-nates	UTM Coordi-nates	MGRS Coordi-nates
Time	Time	Time	Time	Time
Latitude	2-Letter Code	1-Letter Code	3-Letter Code	3-Letter Code and 2-Letter Code

Latitude/Longitude	UK Coordinates	Irish Coordinates	UTM Coordinates	MGRS Coordinates
Longitude	Easting and Northing Coordinate	Easting and Northing Coordinate	Easting and Northing Coordinate	Easting and Northing Coordinate
Altitude	Altitude	Altitude	Altitude	Altitude
Satellites	Satellites	Satellites	Satellites	Satellites

Table 14: Different Location Displays

Latitude/Longitude	UK Coordinates	Irish Coordinates
Time	Time	Time
Latitude	2-Letter Code	1-Letter Code
Longitude	Easting and Northing Coordinate	Easting and Northing Coordinate
Altitude	Altitude	Altitude
Satellites	Satellites	Satellites

- Time – Indicates when the last time the location was calculated. The time is provided in Universal Time Coordinated.

- Letter Code – Grid zone or square on the map for different coordinate standard.

- Latitude – Expressed in degrees, minutes, and seconds.

- Longitude – Expressed in degrees, minutes, and seconds.

- Number of satellites – Used to calculate the location. In general, more satellites provides better accuracy. The maximum is 12 satellites.

- Easting – Refers to the eastward-measured distance expressed in meters.

- Northing – Refers to the northward-measured distance expressed in meters.

NOTE: Skipping each digit of easting and northing coordinates decreases the accuracy by the factor of 10.

5.2.5
GPS Accuracy

The GPS Location Service accuracy depends on the GPS coverage and the selected accuracy mode.

In good GPS coverage (at least -137 dBm or in open sky), the location accuracy presents as follows:

- In high accuracy mode, the accuracy is:
  - 5 m for 50% of location reports.
  - 10 m for 95% of location reports.
- In power optimized or normal mode, the accuracy is:
  - 20 m for 50% of location reports.

○   50 m for 95% of location reports.

> **NOTE:**
> The presented values depend on variety of factors, for example the view on the sky. To optimize the GPS performance the radio should have the clearest possible view of the open sky.

The use of the high capacity battery is recommended, especially when high accuracy mode is used.

5.3
Home Mode Display Text Message

Your radio is provided with a feature that allows your service provider to send special text messages to the display. The message is limited to 24 characters. The message stays on the home screen until a new home mode display message is received. Power cycle your radio to replace the Home Display message to the predefined one.

5.4
Radio Messaging System (RMS)

> **NOTE:** This is a Software Selling Feature.

The Radio Messaging System (RMS) feature allows the radio to receive and send RMS messages through the TETRA network using the Short Data Service (SDS-TL) or Status (STS) as the transport layer.

> **NOTE:** One-Touch Buttons are disabled in the RMS mode.

There are two types of RMS messages:

- RMS Status – a predefined code that is sent bidirectionally between the radio and the service provider. The radio can have up to one hundred statuses that are assigned to numeric keys from 0 to 9. A received RMS status is displayed on the home screen.

- RMS Free Text – (available in SDS-TL only) a unidirectional message containing free text that is sent to the radio by the service provider. Since this type of message may be longer, the radio displays only its beginning on the home screen. To view the full message, go to **Menu** → **Messages** → **RMS Box**.

The latest RMS free text or the latest received or sent RMS status is kept on the home screen until the next power cycle.

RMS free text messages and incoming and outgoing RMS statuses are stored in the **RMS Box**. Its capacity is maximum one hundred entries for incoming and outgoing RMS messages. If the **RMS Box** is full, any new incoming or outgoing RMS message overwrites the oldest message (received or sent).

The latest RMS free text is kept on the home screen until the next power cycle. The latest received or sent RMS status is kept on the home screen until the next power cycle or up to 30 seconds (depending on the settings configured by your service provider).

The radio receives and sends RMS messages only from and to the numbers predefined by your service provider.

See Sending an RMS Status on how to send an RMS message.

5.4.1
Radio Messaging System Icons

Table 15: RMS Icons

Icon	Description
	RMS Status Received Indicates a new RMS status message just arrived.
	RMS Status Sent
	RMS Box Read Message
	RMS Box Unread Message

5.5
SIM Card End-to-End Encryption

The following table presents interactions occurring between radios with and without SIM cards. SIM cards provide End-to-End Encryption.

NOTE: SIM card End-to-End Encryption supports the Federal Office for Information Security of Germany (BSI) feature only.

Table 16: Interactions between Radios with and without SIM Cards

Transmission Type	Transmitting Radio	Receiving Radio	Result
Message	SIM card	No SIM card	The `Delivery failed` notification appears and the message is not received.
Message	No SIM card	SIM card	The message is received.

NOTE:

- To send a message or call a non-SIM card radio, turn off the SIM card End-to-End Encryption.

5.6
Terminal Permanent Disable

NOTE: This is a Software Selling Feature.

Your radio is provided with a feature that allows your service provider to disable it permanently in case it is stolen or lost. When your radio is disabled permanently, it becomes inoperable.

After a Permanent Disable, your service provider cannot enable your radio. It is recommended to Permanent Disable your radio only when you do not expect to recover it. If it is recovered then a Permanent Disable radio can be reactivated by returning it to Motorola Solutions.

5.7
Temporary Disable or Enable

Your radio is provided with a feature that allows your service provider to disable it temporarily in case it is stolen. When your radio is disabled or is powered up in disabled state, it looks and acts like it is turned off.

If your radio is found, your service provider can enable it again over the air. After your radio is enabled, you may resume normal operation.

Appendix A

LED Indications

LED Patterns

The Message LED indicates Call-Out alert or message receiving statuses. The Status LED indicates other general statuses. Each user profile has preprogrammed LED patterns for the following indications:

- Call-Out Alert

- Message

- Status

- Event

NOTE:

- You can choose from nine LED patterns through the configuration tool. Contact your service provider to customize the LED patterns for your user profiles.

- If configured, you can deactivate the blinking green LED indication in the radio Human Machine Interface (HMI).

Table 17: LED Status Indications

Indication	Status
Solid green	In use.
Blinking green	- Call-Out alert of reminder. - In service or idle. - Switching modes from TMO to DMO.
Solid red	Out of service.
Blinking red	- Call-Out alert of reminder. - Failed Group Attachment. - Connecting to the network. - Switching modes from DMO to TMO.
Solid orange	- Radio is powering up. - Transmit inhibit in service. - Channel busy in DMO. - Radio interference in DMO.
Blinking orange	- Call-Out alert of reminder. - Incoming call.
No indication	Radio powered down.

NOTE: Call-Out indications have a higher priority than normal indications like battery indications, coverage indications, and so forth.

Table 18: LED Message Indication

Indication	Status
Blinking blue	- Message received or missing. - Call-Out received or missing.

Table 19: Battery Charging LED Indications

Indication	Status
Solid green	Battery fully charged.
Blinking green	Battery charged at 90%.
Solid red	Rapid or trickle charge.
Blinking red	Faulty or invalid battery.
Blinking orange	Battery is waiting to charge.

NOTE:
When you charge your radio in a multi-unit charger, the LED Power Indicator of the radio indicates the charge status of the battery.

If you insert a radio with a deeply discharged battery into the multi-unit charger, the LED on the radio shows blinking red, indicating a charging error. Resolve this error by reinserting the radio.

Appendix B

Troubleshooting

Your radio displays the following messages:

Table 20: Displayed Messages

Message	Message Description
Attachment Failed	Your radio could not perform talkgroup attachment. It keeps on trying. If it does not succeed, try another talkgroup.
Authenticate Failure	Your radio could not register on an authenticated system (for example, the Authentication Key is incorrect, or authentication is disabled).
Decryption Failed:	An error occurred while decrypting a message.
Faulty Unit Error	Self-test failed. An operational fault has been detected with your radio. Record the error number. Turn your radio off and contact service.
Gateway available	Your radio has connected to a gateway.
Gateway not available	Your radio cannot connect to a gateway, or connection has been lost.
List Empty	There are no programmed entries in the scrolling list. Type the entry.
List Not Attached	All talkgroups in the scan list are not attached.
List Partially Attached	The scan list is active, but not all talkgroups are attached to it.
My Groups Is Empty	You cannot view/delete groups when the **My Groups** folder is empty.
Network Trouble	Network problems. Please try again later.
No Service	Your radio is outside coverage. Return to coverage. Your radio does not display Unit Not Attached notification when in Call-Out protected mode.
No Entries	This message is displayed when accessing an empty list.
No Group	● Attachment failed. Your radio detached from current talkgroup. Please wait until it attaches again to the current talkgroup. ● Displayed when you are out of the normal coverage area of your selected talkgroup. Please select a new talkgroup that is valid for your working location. ● Indicates a favorite group was removed from the **My Groups** folder.
No List	The network list is empty.
No Selected Scan List	You selected an empty network list.

Message	Message Description
`No Service`	Your radio is out of coverage.
`Not Allowed To Transmit`	You are not allowed to send a text message or a status message.
`Overheating, Please Turn Radio Off`	Your radio turns off. Keep it turned off for 5 minutes.
`Please Wait Connecting`	A message during startup.
`Radio Disabled`	Check with your service provider.
`Registration Failure`	Your radio could not register within the system. Please try again later.
`Repeater available`	Your radio has connected to a repeater.
`Repeater not available`	Your radio cannot connect to a repeater, or connection has been lost.
`Service Denied`	Invalid number. Call your service provider.
`Service Not Available`	This service is not available on the current network.
`Service Restricted`	This service or feature is restricted by your service provider, it has not been purchased, or it is not available.
`Single TalkGroup Only`	There is only one programmed entry in the scrolling list.
`Try Again Later`	The requested service is temporarily unavailable.
`Unit is OK` `Warn:`	Self-test error. A minor fault has been detected. Your radio is still fully operative. If this error recur, note the error code and contact service.
`Unit Not Attached`	Your radio could not attach to the system. The talkgroup may not be defined in the system. Please try another group. Your radio does not display `Unit Not Attached` notification when in Call-Out protected mode.
`Low Battery`	The battery radio for your radio is depleting. Attach your radio to a charger or attach your battery to a multi-unit charger. Your radio does not display `Low Battery` notification when in Call-Out protected mode.

Appendix C

Maintenance

TIP:

- Before using your radio for the first time, charge the battery until the LED lights green.

- Battery charging must occur only in non-hazardous areas.

C.1
Extending Battery Life

A battery is an expendable part and may need replacing during the life of the radio. To ensure maximum service life of your radio, always replace the battery with a genuine Motorola Solutions replacement.

C.2
Battery Charging Temperature

If, during charging, the temperature is out of range, the battery might not be fully charged since the charging is temporarily stopped until the temperature becomes suitable. The temperature range of battery operation is from 0 °C to +45 °C in charger mode.

C.3
Additional Battery Warnings/Cautions

- To prevent injury, do not allow metal objects to touch the battery contacts.

- Do not disassemble.

- Do not throw in fire.

- Do not dispose of battery in household waste.