TM9900 Multiband, Multiprotocol Mobile Radio

User Manual

MMH-00001 - Issue 1 - DRAFT

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Preface

Scope of Manual

This manual applies to the use of the TM9900 Multiband, Multiprotocol Mobile Radio. It is intended for end users of the product.

Alerts

Please follow exactly any instruction that appears in the text as an 'alert'. An alert provides necessary safety information as well as instructions about the proper use of the product. This manual uses the following types of alert:

Warning This alert is used when there is a hazardous situation which, if not avoided, could result in serious injury or death.

This alert is used when there is a hazardous situation which, if not avoided, could result in minor or moderate injury.

This alert is used to highlight significant information that may be required to ensure that you perform procedures correctly, or to draw your attention to ways of doing things that can improve your efficiency or effectiveness.

Associated Documentation

The following associated documentation for this product is available on the Tait Partner Portal website, https://partnerinfo.taitradio.com.

- MTA-00011-xx Portable and Mobile Radio Safety and Compliance Information

The characters **xx** represent the issue number of the documentation.

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Acronyms

Acronym	Definition

Publication Record

Issue	Publication Date	Description
1	TBA 2025	First release

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1 Getting Started

This chapter provides an overview of the TM9900 Mobile Radio's controls, functions and LED indicators, the icons on the radio's display, and audible tones the radio emits.

1.1 Radio Controls and Functions

The following section details the controls and functions for the various local and remote control heads available for the TM9900 Mobile Radio.

1.1.1 TCH3 Color Control Head

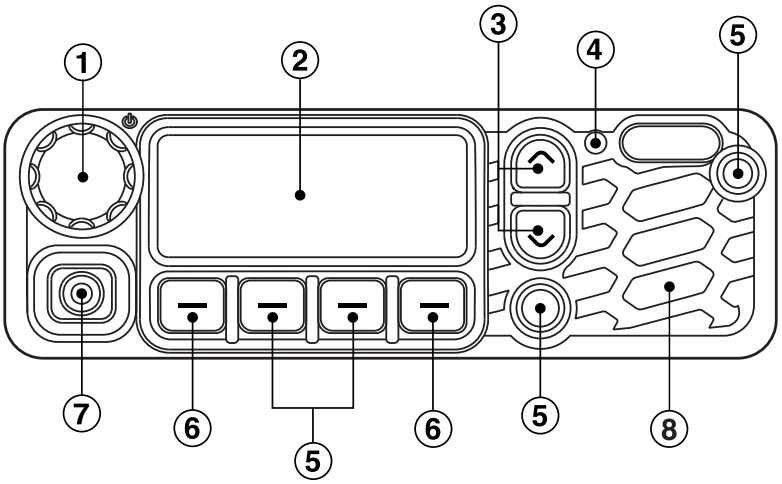

Figure 1.1 TCH3 control and connection locations

Table 1.1 TCH3 control names and functions

	Name	Function
1	Power on/off button	Long press to switch on/off
1	Volume control dial	Rotate to change the speaker volume
2	Display	Shows onscreen device information
3	Up and down scroll keys	Scroll up and down through menu options
4	LED status indicator	Color indicates device status
5	Function keys	Programmed for frequently used options
6	Softkeys	Programmed for various menu functions
7	Microphone socket	Socket for either a standard or keypad microphone
8	Speaker	Where audio output is heard

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1.1.2 TCH4 Color Control Head

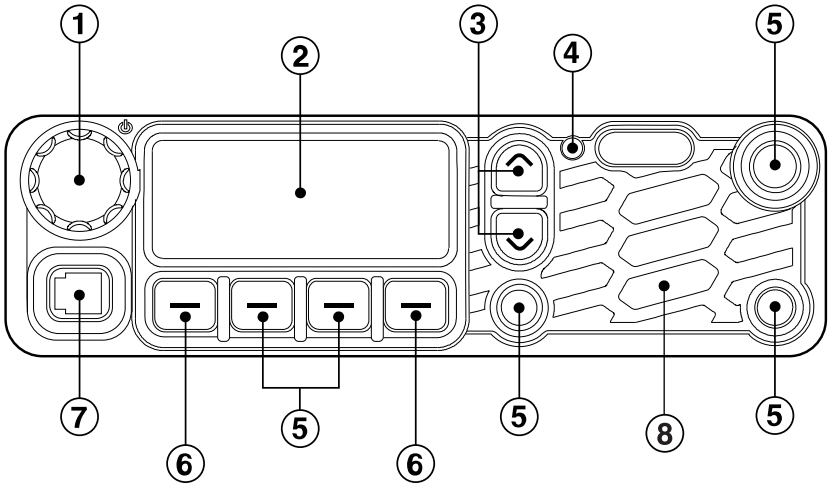

Figure 1.2 TCH4 control and connection locations

Table 1.2 TCH4 control names and functions

	Name	Function
1	Power on/off button	Long press to switch on/off
1	Volume control dial	Rotate to change the speaker volume.
2	Display	Shows onscreen device information
3	Up and down scroll keys	Scroll up and down through menu options
4	LED status indicator	Color indicates device status
5	Function keys	Programmed for frequently used options
6	Softkeys	Programmed for various menu functions
7	Microphone socket	Socket for either a standard or keypad microphone
8	Speaker	Where audio output is heard

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1.1.3 TCH6 Color Control Head

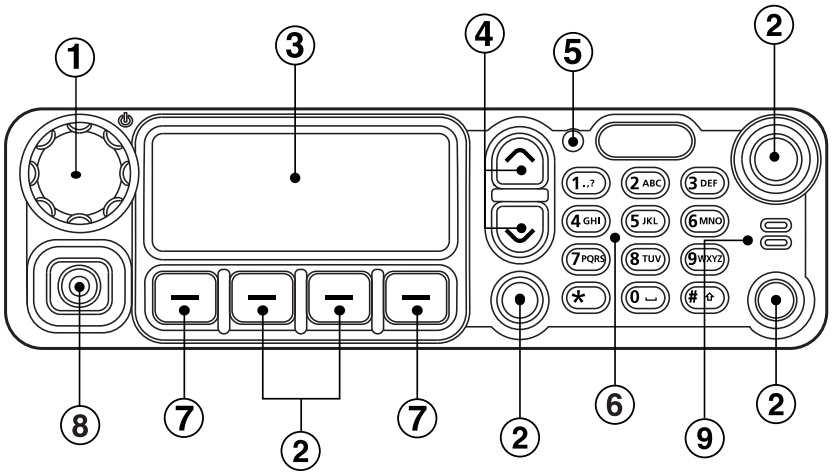

Figure 1.3 TCH6 control and connection locations

Table 1.3 TCH6 control names and functions

	Name	Function
1	Power on/off button	Long press to switch on/off
1	Volume control dial	Rotate to change the speaker volume.
2	Function keys	Programmed for frequently used options
3	Display	Shows onscreen device information
4	Up and down scroll keys	Scroll up and down through menu options
5	LED status indicator	Color indicates device status
6	Alphanumeric keypad	Function of keys depends on radio configuration.
7	Softkeys	Programmed for various menu functions
8	Microphone socket	Socket for either a standard or keypad microphone
9	Covert Microphone	Where audio is recorded

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1.1.4 Large Control Head

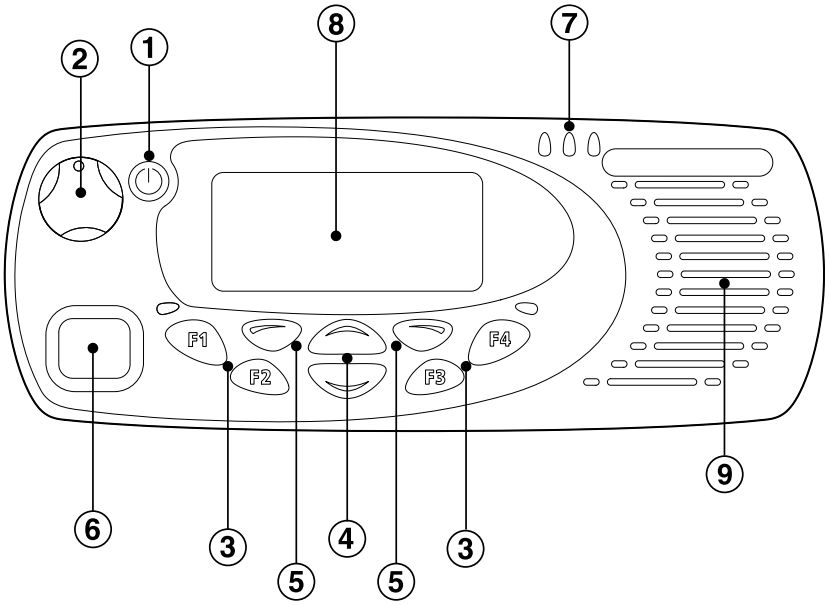

Figure 1.4 Large Control Head control and connection locations

Table 1.4 Large Control Head control names and functions

	Name	Function
1	On/off key	Long press to switch on/off
2	Volume control	Rotate to change the speaker volume
3	Function keys	Programmed for frequently used options
4	Up and down scroll keys	Scroll up and down through a list of menu options, scroll left and right in messages, or access a pre-programmed menu
5	Left and right selection keys	Action determined by the text above the selection key
6	Microphone socket	Socket for either a standard or keypad microphone
7	LED status indicators	Provides information about the state of the radio
8	LCD display	Screen that shows menus and messages
9	Speaker	Where audio output is heard

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1.1.5 Hand Held Control Head

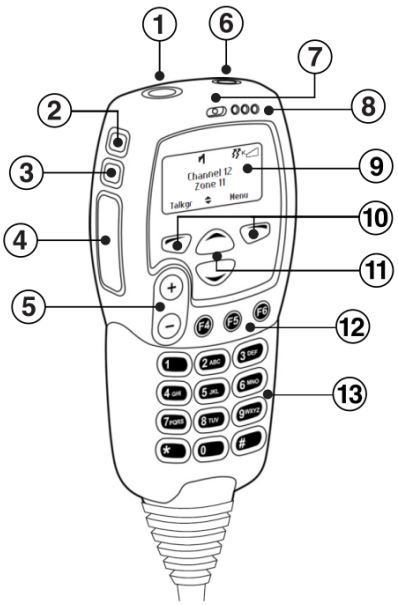

Figure 1.5 Hand Held Control Head control locations

Table 1.5 Hand Held Control Head control names and functions

	Name	Function
1	Function key 1	Operates programmed functions
2	Function key 2	Operates programmed functions
3	Function key 3	Operates programmed functions
4	PTT (Push-To-Talk)	Press and hold to speak release to listen
5	Volume control	Press up to increase volume. Press down to decrease volume
6	On/off key	Long press to switch off
7	Microphone	Where transmitted voice is spoken
8	Status LEDs	Provides information about the state of the radio
9	Display	Screen that shows menus and messages
10	Selection keys	Press left or right to select programmed functions
11	Scroll keys	Press up or down to scroll through options
12	Function keys 4-6	Operates programmed functions
13	Alphanumeric keys	Function of keys depends on radio configuration

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1.1.6 Dual control heads

Your TM9900 may be fitted with dual control heads as a convenient way to control one radio from two separate locations.

Only paired dual LCH, HHCH, TCH4 and TCH6 radio control heads are supported. Control heads types cannot be mismatched.

In a dual control head installation, operations carried out on one control head will appear on the other.

1.1.7 Keypad microphone

The keypad microphone features a PTT key, twelve alphanumeric keys, two scroll keys, and left and right selection keys.

The microphone can be used for dialing or freeform text messaging.

The two scroll keys and left and right selection keys duplicate the keys on the control head, enabling you to navigate the radio menu and functions from a distance.

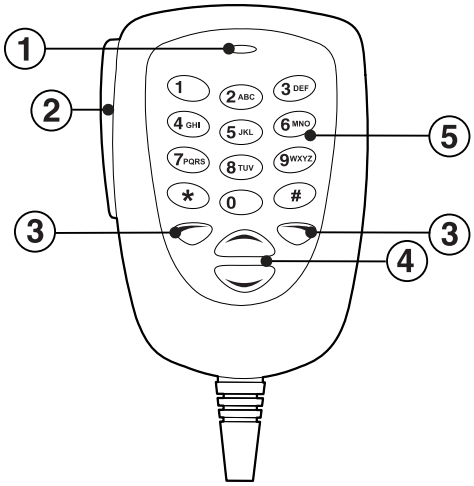

Figure 1.6 Location of keypad microphone controls

Table 1.6 Keypad microphone functions

	Name	Function
1	Microphone	Where transmitted voice is spoken
2	PTT (Push to Talk)	Press and hold to speak, release to listen
3	Selection keys	Press left or right to select programmed functions
4	Scroll keys	Press up or down to scroll through options
5	Alphanumeric keys	Function of keys depends on radio configuration

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1.1.8 Standard microphone

The standard microphone provides a simple user interface, consisting of a microphone combined with a PTT key.

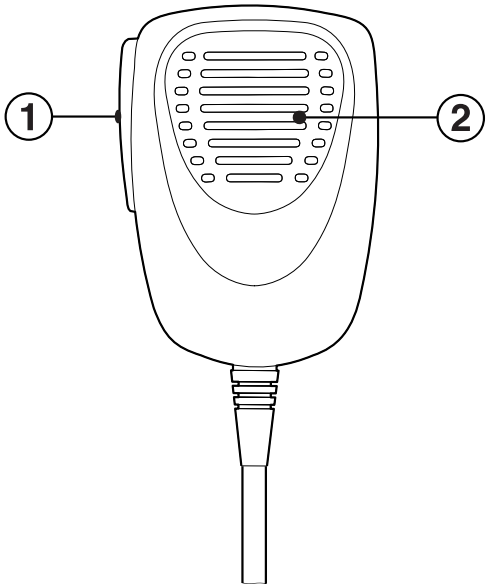

Figure 1.7 Standard microphone

Table 1.7 Standard microphone functions

	Name	Function
1	PTT (Push to Talk)	Press and hold to speak, release to listen
2	Microphone	Where transmitted voice is spoken

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1.2 Radio Status Indicators

The following section details the TM9900 Mobile Radio's LED indicators, icons on the display, and the audible tones emitted by the radio.

1.2.1 LED indicators

The below table shows the color and descriptions of the TM9900's LED indicators.

Table 1.8 LED colors and meanings

LED Color	Meaning
Red	Solid: your radio is transmitting Flashing: your transmit timer is about to expire
Green	Solid: • conventional: the current channel is busy • trunked: the radio is in a call Flashing: you have received a call or monitor is active
Amber	Solid: • conventional: the radio is scanning a group • trunked: the radio has service Flashing: • conventional: the radio has halted group scan on an active channel • trunked: the radio is searching for service.
Off	Conventional: receive standby Trunked: no service

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1.2.2 Radio display icons

The icons shown on the radio's display during use are detailed in the tables below. Some icons will only appear when the radio is in trunked or conventional mode.

Table 1.9 Radio display icons, names, and descriptions

Icon	Name	Description
	Transmit	The radio is transmitting
	Low-power transmit	The radio is transmitting in low power mode
	Scanning	The radio is monitoring a group of channels or workgroups for activity
	External alert	External alert is active
	Silent operation	The radio’s audible tones have been turned off
	Automatic mode	Automatic selection of channels or zones is active
	Manual mode	Manual selection of channels or zones is active
	Scrambler / Encryption	The voice-inversion scrambler is turned on (analog channels only) The radio's transmissions are encrypted
	Signal strength indicator	Indicates signal strength—the more bars, the stronger the signal being received by the radio
	Scrolling	Use scroll keys to move through a list, or access a pre-programmed menu
	Queuing	There are calls or messages in the queue

Table 1.10 Trunked mode icons, names, and descriptions

Icon	Name	Description
	Scanning	Scanning has been turned off
	Homegroup	The radio has been returned to the homegroup using the homegroup toggle function key
	Network / Trunking system available	The radio is registered on a DMR or MPT trunked network, or The radio is operating on a P25 trunking system Flashing: the radio is hunting for a trunked network
	‘Full’ queuing activated	All calls and messages are sent directly to the queue
GO	Call established	The radio has established a call and you are now able to speak to the other party

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Table 1.11 Conventional mode icons, names, and descriptions

Icon	Name	Description
	Monitor or squelch override	Monitor or squelch override is turned on
	Scanning	The radio is monitoring a group of channels or talkgroups for activity, and the currently selected channel or talkgroup is a member of the scanning group
	Repeater talkaround	The radio is operating in repeater talkaround mode, or you are using a simplex channel
A	Zone	The letter represents the zone in which the radio is operating, where A is zone 1, Z is zone 26

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1.2.3 Audible tones

The radio uses audible tones to alert the user to its status. The table below details these tones and their meaning.

If quiet or silent mode is active, no tones will be heard.

Table 1.12 Audible tones and descriptions

Audible Tone	Description
One short beep	Valid keypress: the action you have attempted is permitted Function activated: a function has been turned on (using a function key)
One short, low-pitched beep	Function deactivated: a function has been turned off (using a function key)
One long, low-pitched beep	Invalid keypress: the action you have attempted is not permitted Transmission inhibited: you have attempted to transmit, but for some reason you cannot make a call at this time
One short, high-pitched beep	Radio is stunned: the radio has been made inoperable by your service provider
Two short beeps	Radio turned on: the radio is powered on and ready to use Radio is revived: the radio has been made operable by your service provider
Two low-pitched beeps	Radio's temperature is high: the radio's temperature is in the high-temperature range, but the radio will continue to operate
Two high-pitched beeps	Radio's temperature is very high: all transmissions will now be at low power; if the radio's temperature rises outside this range, transmissions will be inhibited. Turn off the radio and allow it to cool down
Two long high-low pitched tone pairs	Synthesizer out-of-lock: the radio's synthesizer is unstable, causing frequency drift and signal issues, preventing operation on the current channel (display shows "Out of lock"). Contact the radio provider
Three long beeps	Transmit timeout imminent: your transmit timer will expire and your current transmission will be terminated
Continuous low-pitched tone	Radio system error: a system error has occurred and the radio may be inoperable. Contact the radio provider

1.2.4 Voice Annunciation

The radio may be programmed to play pre-recorded messages when it is turned on or off, if certain functions are performed, or events occur. Check with the radio provider for more information.

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2 Basic Operation

This chapter provides basic information and instruction on how to operate the TM9900 Mobile Radio.

2.1 Turning the Radio On and Off

Long press the **on/off key** to turn the radio either on or off.

When the radio is first turned on:

- the red, green and orange LEDs flash briefly on units equipped with a HHCH or LCH.
- the single multicolor LED illuminates red on units equipped with a TCH3, TCH4 or TCH6 control head .
- the radio gives two short beeps.
- a brief message appears on the display.

2.1.1 Security lock on power-up feature

Your radio may be automatically locked each time it is powered-up.

If the message **Enter PIN** appears on the display, enter your assigned PIN (personal identification number).

2.2 Locking and Unlocking the Radio

2.2.1 Lock the radio

1. Press **Menu** and select **Radio settings > Functions > Lock radio**.

   Depending on how your radio is programmed, you may be able to press a function key to turn radio lock on and off.

2. Scroll to either On or Off and press **Select**.

   The radio is now locked, and the message **Enter PIN** appears on the display.

The radio remains locked until the correct sequence of keys is pressed. If you forget the unlock sequence or you do not know it, contact your radio provider for assistance.

2.2.2 Unlock the radio

To unlock your radio, use the unlock sequence provided. This is a pre-programmed sequence of four keys.

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2.3 Locking and Unlocking the Keypad

The keypad lock feature prevents you from pressing a key accidentally. The number of keys that are locked depends on the way your radio is programmed.

If you receive a call while the keypad is locked, press any key to answer.

2.3.1 Lock the keypad

Press and hold the **right selection key** for about one second.

The message "Keypad locked" briefly appears on the display, and Unlock appears above the right selection key.

When any of the locked keys are pressed, the message "Keypad lock active" appears.

2.3.2 Unlock the keypad

Press and hold the **right selection key** for about one second.

2.4 Navigating Menus

2.4.1 Accessing the main menu

1. Press the **right selection key** whenever the word **Menu** appears above it.
2. Use the **scroll keys** to move through menu items.
3. When the desired menu item is highlighted, press **Select** to open it.

2.4.2 Exiting a menu

Press the **left selection key** when the word **Cancel** or **Back** appears above it.

> To quickly return to the top level of the menu, press and hold the **left selection key**.

2.5 Selecting a Zone

A zone is a collection of channels. Zones are a way of grouping channels, for example, by public safety agency type, or by geographical region.

To select a zone:

1. Press **Menu** and select **Zones**.
2. Use the scroll keys to highlight the desired zone, then press **Select**.

The radio indicates the current zone in the following ways:

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- the name of the zone appears below the channel name in the radio display, or
- the zone icon appears as one or two letters in the top right corner of the display.

2.6 Selecting a Channel

2.6.1 Using the main menu

1. Press **Menu** and select **Channels**.
2. Use the **scroll keys** to highlight the desired channel, then press **Select**.

2.6.2 Using the keypad

1. Dial the number associated with the channel using the alphanumeric keypad.

   To delete an incorrectly dialed digit, press **Clear**.
2. Press **Select** or **#** to confirm the channel change.

The channel name associated with the new channel appears in the default display.

2.6.3 Automatic channel selection

The radio may be configured to change channels automatically based on current location. The automatic mode icon is visible on the display A.

Selecting a channel manually as described above will end automatic mode, and the manual mode icon appears on the display M.

2.7 Selecting a Talkgroup

A talkgroup is a collection of radio users with whom you want to have private conversations. For example, a state's public safety agencies could have the following talkgroups:

- local talkgroups—used by a specific agency to communicate within their own local agency. It may even be made up of a county of public safety officers.
- regional talkgroups—used by large state agencies that have regional divisions.
- statewide talkgroups—used by an agency to communicate with public safety members in other regions. Statewide talkgroups, as their name suggests, enable public safety agencies to communicate with each other from one end of the state to the other.
- special event talkgroups—may be used to manage emergencies encompassing a large area, or even events such as visits by heads of state.

To select a talkgroup:

1. Press **Menu** and select **Talkgroups**.
2. Use the **scroll keys** to highlight the desired talkgroup, then press **Select**.

Talkgroups can be assigned to each channel, to allow users to:

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- initiate a call to a talkgroup by pressing the PTT key.
- listen and respond to conversations on one or multiple talkgroups.

A channel may be named to reflect its talkgroup association. When making a call, the talkgroup name will appear.

2.8 Making a Call

To make a call:

1. Select the desired **Zone**—if required.
2. Select the desired **Channel**.
3. Hold the microphone in front of your face, angled slightly away, about 1—2 inches (2—5 centimeters) from your mouth.
4. Press and hold the **PTT key**, wait a few seconds, then speak slowly and clearly.

   Some radios will beep—wait for the beep before you begin speaking.
5. When you have finished speaking, release the **PTT** key .

While transmitting, the LED glows red and the transmit or low power transmit icon appears on the display. Some channels may always transmit at low power.

To ensure clear speech while transmitting:

- press and hold the PTT key throughout transmission.
- avoid speaking before pressing the PTT key to prevent cutting off the start of your sentence.
- refrain from shouting.

If the channel is busy, you may not be able to transmit. Wait until the status LED has stopped glowing green, then try again.

2.9 Accessing Menu Items with Function Keys

The radio's Function Keys may be configured to access menu items directly, or activate radio features.

To check the features assigned to the radio’s function keys:

1. Press **Menu** and select **Radio settings > Radio info > Key settings**.
2. Use the **scroll keys** to scroll through the list of function keys.
3. Press **Select** to view details of the function associated with a particular function key.

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2.10 Changing the Radio's Operating Mode

The way the radio performs basic functions, such as sending and receiving calls, depends on the network operating mode. The two operating modes that may be available on the radio are:

- conventional mode
- trunked mode

To change the operating mode:

1. Press **Menu** and select **Change mode**.
2. Select **Yes** to confirm selection.

   The radio now shows the default display for either trunked or conventional mode.

2.11 Activating an External Speaker

An external speaker is used to increase the volume of the audio from the radio's standard speaker. External speaker activation is assigned to a function key, see Accessing Menu Items with Function Keys on the previous page.

2.11.1 Turning on the external speaker

Long press the function key programmed for external speaker.

The message "PA Speaker Activated" briefly appears on the display.

2.11.2 Turning off the external speaker

Long press the function key programmed for external speaker.

The message "PA Speaker Deactivated" briefly appears on the display.

2.11.3 Checking the state of the external speaker

Short press the function key programmed for external speaker.

The message "PA Speaker is active" or "PA Speaker is not active" briefly appears on the display.

2.12 Updating the Radio Configuration

Configuration updates that are delivered over the air are either installed immediately, or once the user has accepted the activation prompt.

If the activation prompt is declined, the configuration update can be manually installed later.

To manually install an update:

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1. Press **Menu** and select **Radio updates > Install update**.
2. Follow the prompts on the display.

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3 Using the Address Book

Your radio may have a standard address book with pre-programmed entries and a personal address book which allows you to maintain your own entries.

The address book only shows entries that are relevant to your radio's current mode of operation (conventional or DMR trunked) and network.

The standard address book may be grouped by roles, but you can also select to display all entries.

The standard address book can also contain entries that are hidden from the radio user. These hidden entries are used to identify incoming calls from known sources.

3.1 Opening the Address Book

To open the address book, press **Menu** and select **Address book**.

When opening the address book for the first time after turning on the radio or changing the mode, you are asked to select the default address book:

1. Use the scroll keys to highlight **Personal** or **Standard**.
2. Press **Select**.

The radio will default to the selected address book.

3.2 Changing the Default Address Book

To change the default address book:

1. Press **Menu** and select **Address book**. The standard or personal address book appears.
2. Press **Back**.
3. You can now select the default address book.

3.3 Navigating the Address Book

In the standard address book, each entry may have been assigned to a role. Roles are used to categorize entries into logical groups.

When opening the standard address book, you can view all entries or filter the entries by a particular role.

The personal address book always lists all entries.

1. Press **Menu** and select **Address book**.

   In the standard address book, you can now select to view all entries or select to view the entries of a role.

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2. Scroll to the role you want, and select **Select**.

   All entries associated with the selected role are now displayed.

3. Scroll to the entry you want.
4. Press the **PTT key** to make a call.
5. You can also press **Options** to:
   - call the address or select the channel.
   - send a status, text message, emergency or priority call—depending on the type of entry.
   - view the entry details.
   - add an entry of the standard address book to your personal address book.
   - add, edit or delete entries in the personal address book, including adding the last call.

If the number of an incoming or dialed call occurs in both the standard and the personal address books, the radio will display the name defined in the personal address book.

When adding an entry from the standard address book to the personal address, the role is added as well.

3.4 Filtering Address Book Lists

You can use this method to select a role or entry if you know its name.

- In the roles or entries list, start typing the name—e.g. for 'Jonathan' press **5** (J) and **6** (o) until the desired role or entry appears.

3.5 Maintaining Personal Address Book Entries

The personal address book allows you to:

- create, edit and delete entries
- add the last caller
- copy entries from the standard address book

The personal address book can contain up to 100 entries.

New address book entries are only relevant to your radio's current mode of operation (conventional or DMR trunked) and network.

3.5.1 Creating, editing, and deleting personal address book entries

To manually create a personal address book entry:

> To edit or delete entries, select the corresponding option.

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1. Press **Menu** and select **Address book**.

   If the standard address book appears, press **Back** and switch to the personal address book.

2. Press **Options** and select **New entry**.

3. Enter a name.

   Press **Clear** to correct any mistakes.

   Press **Options** and select **Next**.

4. In conventional mode, select the **Entry type**.

5. Press **Select**.

6. Enter the number or channel.

7. Press **Options** and select **Save**.

3.5.2 Adding the last caller to the personal address book

If you received an individual call or a text message, you can add the caller to the personal address book:

1. Press **Menu** and select **Address book**.

   If the standard address book appears, press **Back** and switch to the personal address book.

2. Press **Options** and select **Add last call**.

> **Add last call** only appears if you received an individual call (in all modes except analog conventional) or a text message.

3. Enter or edit the name.
   - select **Clear** to correct any mistakes
   - select **Options** then select **Next**

4. In trunked mode, the number of the last call appears on the display.

   If you want to edit the number, select **Change**.

   Otherwise, press **Options** and select **Save**.

5. In conventional mode, select **Entry details**.

   If you want to edit the details, select **Change**.

   Otherwise, press **Options** and select **Save**.

3.5.3 Copying an entry between address books

To copy a standard address book entry to the personal address book:

1. Press **Menu** and select **Address book**.

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2. If the personal address book appears, select **Back** and switch to the standard address book.
3. Select a standard address book entry—from a role or all entries—and select **Select**.

> The entry types Talkgroup and Status Update cannot be copied to the personal address book.

4. Press **Options** and select **Add to personal**.

You can now go to the personal address book and change the new entry to make corrections to the name or number.

If the number of an incoming or dialed call occurs in both the standard and the personal address books, the radio will display the name defined in the personal address book.

If the entry from the standard address book has a role assigned, the role will also be copied to the personal address book. In this case the personal address book will display the role in a second line.

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4 Emergency Operation

This section describes emergency operations on the TM9900, and how to make different types of emergency calls.

4.1 About Emergency Operation

In an emergency you may be able to summon help by sending an emergency call. After making the call, your radio may be programmed to enter emergency mode. While emergency mode is active, your radio may cycle between receive and transmit, so that your dispatcher or the called party can hear any activity near your radio.

On most networks, an emergency call takes precedence over other call types, and existing calls are cleared down so that the emergency call can proceed.

To make an emergency call from your radio, you may be able to either:

- use a function key programmed for emergency mode.
- dial the emergency call using the alphanumeric keys.
- make an emergency call using:
  - the address book, see Making a Call Using the Address Book on page 55
  - a workgroup, see Making a call to a workgroup on page 54
  - a preset, see Making a preset call on page 48

4.2 Emergency Call Types

Table 4.1 below details the three types of emergency calls available:

Table 4.1 Emergency call types

Call type	Explanation
Standard emergency call	When an emergency call is initiated, the radio enters ‘emergency mode’. For further information see Standard Emergency mode on the next page.
Manual emergency call	(Digital channels only.) Emergency is activated and your radio sends an alert to your dispatcher and other members of your group, along with your radio digital alias and location. For further information see Manual Emergency Operation on the next page.
Priority call	(Digital channels only.) An emergency alert is automatically sent to the current talkgroup. Calls made when the priority call feature is turned on are flagged as ‘emergency’ calls. For further information see Making a Priority Call on page 36.

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4.3 Standard Emergency mode

When you press the emergency key your radio enters emergency mode.

When the radio enters emergency mode, it will automatically send alerts together with your radio unit ID to the dispatcher. These alerts are usually sent on a designated emergency channel.

For further information on what your radio may do in emergency mode, see What Happens During an Emergency Call on page 37.

4.3.1 Activating standard emergency mode

You can activate emergency mode using the emergency function key, or a hidden switch if your radio is installed with one.

Long press the **emergency function key** or hidden switch to activate emergency mode.

In non-stealth emergencies, "Emergency mode" appears on the display.

One or more emergency calls are sent to your dispatcher or another predetermined radio user. During emergency mode, the radio will behave as described in What Happens During an Emergency Call on page 37.

> If your microphone is removed or damaged by an assailant, you still may be able to communicate with the dispatcher using the concealed microphone. This microphone is hidden behind the speaker and can only be used during emergency mode, if your radio is programmed in this way.

4.3.2 Deactivating standard emergency mode

Turn the radio off and on again to end emergency mode. The radio returns to normal operation.

4.4 Manual Emergency Operation

When you press the emergency key, your radio sends an alert to your dispatcher and other members of your group, along with your radio digital alias and location.

While the emergency call is active, the emergency information is sent out periodically, until either you or another member of your group end the emergency call.

You are still able to make and receive voice calls while emergency information is being sent, but your radio does not display caller details.

This feature is available for digital channels only.

4.4.1 Making a manual emergency call

Press and hold the **emergency key** for longer than three seconds.

The radio gives three short beeps, rising in pitch.

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> You will not be able to make a voice call on the channel until the 3-second emergency alarm has finished.

"Emergency" appears on the display, and remains until the manual emergency call is canceled.

If you receive an acknowledgment from another radio in your group, the manual emergency call is canceled, and the message "Emergency Acked" briefly appears on the display

4.4.2 Receiving a manual emergency call

When your radio receives a manual emergency call, **Emergency** appears in the display, along with the identity of the radio that initiated the emergency call.

A loud repeating emergency alarm sounds for three seconds. If location information has been sent, "Location" appears on the display.

4.4.3 Canceling a manual emergency call

If the emergency situation has been resolved, the manual emergency call can be canceled either by you or another member of your group.

Canceling an emergency call you have made

Press and hold the **emergency key** for longer than three seconds.

The message "Emergency canceled" appears on the display.

Your radio now returns to the channel that it was operating on prior to the emergency call.

Canceling a manual emergency call you have received

When you have received a duress emergency call, the Emergency menu always moves to the top of the menu list.

In the Emergency Menu, you can manually acknowledge the duress emergency call. This acknowledgment cancels the call.

1. Press **Menu** and select **Emergency > Acknowledge**.

   The name of the radio that initiated the emergency call appears on the display.

2. Press **Send** to cancel the manual emergency call from that number.

   The message "Emergency ack. sent" briefly appears on the display

4.5 Making a Priority Call

When you turn the priority call feature on, the radio automatically sends an emergency alert message to the current talkgroup.

Any calls you make while the priority call feature is turned on are flagged as emergency calls.

To turn the priority call feature on and off:

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1. Press **Menu** and select **Priority call**.

   Depending on how your radio is programmed, you may be able to press a function key to turn priority call on and off.

2. Scroll to On or Off and press **Select**.

4.6 Dialing an Emergency Call

> Dialing is only available for radios with alphanumeric keys.

1. Dial ***9**.

2. Press **Send** or the **#** or **PTT key**.

   An emergency call is now sent to the emergency location that has been programmed for your radio.

> If you wish to send an emergency call to another radio, you may be able to dial ***9*n** then press the **#** or **PTT key**. In this case, **n** is the radio unit number you wish to send the emergency call to and may be a two- or three-digit number.

4.7 What Happens During an Emergency Call

The way your radio behaves when it enters emergency mode depends on how your radio is programmed.

The main phases for both stealth and non-stealth emergency modes are summarized below. The length of each phase is determined when the radio is programmed.

See Stealth and Non-stealth Emergency Modes on the next page.

When the emergency key is pressed:

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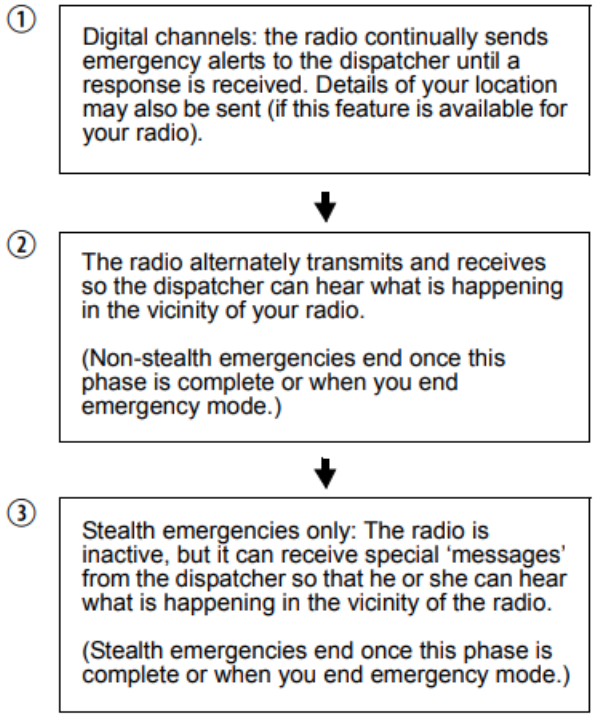

4.8 Stealth and Non-stealth Emergency Modes

Your radio is programmed to operate in one of these ways:

- **Stealth**: you often work in situations where you do not want an assailant to know that you have activated emergency mode. For this reason, the radio is silent and the display remains unchanged—there is no indication that the radio has entered emergency mode.

  An optional feature of stealth emergencies is false powerdown ('keep alive'). When an unauthorized person attempts to prevent you from using your radio by turning it off, the radio appears to turn off. However, the radio is still in emergency mode.

- **Non-stealth**: you often work in situations where you want audible and visual confirmation that you have activated emergency mode—for example, at an accident scene.

4.9 Loneworker Monitoring

Loneworker monitoring is a safety feature for people who work alone. Loneworker monitoring may be programmed to be on or off at all times, or can be switched on and off by the user using a programmed function key or the menu.

When the predetermined time has expired, an audible warning is given and you have a predetermined time to respond.

If you are unable to respond, the radio either enters emergency mode or (in trunked mode) sends a status update to a predetermined person or talkgroup.

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4.9.1 Activating loneworker monitoring

1. Press **Menu** and select **Radio Settings > Extra features > Loneworker**.
2. In the **Loneworker** menu, choose **On**.

   A vertical scroll bar on the right-hand side of the display indicates the remaining activity timeout.

4.9.2 Responding to a loneworker alarm

If you hear a beep to indicate that the radio is expecting a response from you to acknowledge that you are safe.

The message "Loneworker awaiting" and a horizontal scroll bar appear indicating the remaining time until an emergency action is triggered.

Press any key to respond.

Otherwise the radio will activate emergency mode or, if in trunked mode, send a status update.

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5 Multiprotocol Operation

The TM9900 Mobile Radio supports analog operation, P25, and DMR protocols. The TM9900 adopts the operating protocol according to the selected channel or talkgroup, eliminating the need for manual selection.

There is no indicator on the TM9900's display that identifies the operating protocol. Tait recommends choosing channel and talkgroup names that indicate the protocol type.

Check the above is true!

5.1 Multiprotocol Switching

The TM9900 switches between P25 and DMR protocols in approximately 3 seconds. The message, "Please wait..." appears on the display during this time.

5.2 Analog Support

The following analog operations are supported when switching protocols:

- 2-Tone (Type 99)
- Dual-Tone Multi-Frequency (DTMF)
- MDC1200 signaling types
- Selcall

5.3 Scanning and Roaming

Scanning is only supported in P25 mode for groups with P25 and analog channels, and in DMR mode for groups with DMR conventional channels.

The TM9900 does not support scanning or roaming between channels, talkgroups, or systems of different protocols.

The user will receive an error message if they:

- attempt to add a P25 or analog channel/talkgroup to a scan list of DMR channels/talkgroups
- attempt to add a DMR channel/talkgroup to a scan list of P25 and/or analog channels/talkgroups

5.4 Function Key Actions

Function control actions programmed for conventional mode (excluding DMR Tier III) are common to both protocols where possible.

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5.5 Emergency Messages

Emergency messages can be sent to channels on different protocols. A 4-second delay to switch protocols occurs before the emergency message is transmitted.

5.6 Stun or Inhibit Commands

If the radio is configured to receive 'Stun' or 'Inhibit' commands on a channel or talkgroup of a specific protocol, receiving that command will stun or inhibit the TM9900 on all protocols.

5.6.1 Radio Inhibiting and Uninhibiting

If you want to make another radio on the system inoperable, you can use the radio inhibit feature.

To the user of the inhibited radio, it appears as though the radio is idle, but it will be inoperable. The radio remains inoperable even if it is turned off and then on again.

> When a radio is inhibited, the encryption keys may be automatically deleted.

The radio cannot return to operation until it receives an uninhibit request. This is also known as 'revive'.

Sending a radio inhibit request

1. Press **Menu** and select **Services > Radio inhibit**.
2. Scroll to the desired radio to make it inoperable.
3. Select **Send to**.

On the inhibited radio, the LED glows red, and the message "Radio stunned" appears on the display, indicating the radio has been immobilized.

Sending a radio uninhibit request

1. Press **Menu** and select **Services > Radio uninhibit**.
2. Scroll to the radio to be made operable.
3. Press **Send to**.

The uninhibited radio will briefly display the message "Radio revived". The radio returns to normal operation.

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6 Operating on Conventional Channels

This section explains how the radio operates on conventional radio channels.

> Some features in this section are controlled by software licenses (SFE) and may not be available with your radio.

6.1 Making a local call

For analog channels, each channel on the radio may have one or more local calls programmed.

To make a local call:

1. Select the required channel.
2. Press **Menu** and select **Local calls**.
3. Scroll through the list of local calls until the desired call appears.
4. Press **Send**.

6.1.1 Dialing a radio call

To dial a call to another radio, or group of radios:

1. Select the required channel.
2. Press **Menu** and select **Dial radio call**.
3. Dial the number using the alphanumeric keys. For analog calls, press **Send**.

> The radio may be programmed so a call can be dialed directly from the default display. In this case, it's possible to start dialing the call without selecting the menu option.

On an analog channel using SelCall/5-Tone Network setup, you may encounter **X** and **S** characters, prompting the user to dial over them.

When the called party responds to the call, the message "Ack received" is displayed.

Additionally, on the same analog channel, the radio can be programmed to utilize group tones by pressing the asterisk (*) or hash (#) keys. Dialing asterisk (*) fills one **X**, while hash (#) fills the current **X** and all subsequent **X** characters in the current burst.

6.1.2 Making a phone call or DTMF patch call

A telephone network can be directly connected to by manually dialing the number or using preset dialing sequences if the network is configured to support phone calls.

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1. Select the required channel.
2. Press **Menu** and select **Phone call**.
3. If an address book is configured, the options shown are to either dial a number or show the address book. Otherwise, the only option is to dial a number.
4. Press **Call**.

Using a function key

> Depending on how DTMF patch calls are programmed, some of the following steps may not be necessary.

1. Select the required channel.
2. Press the function key programmed for DTMF patch call (the radio may send tones to capture the line).
3. Press **Send**, or press the function key a second time, to send the preset number—there may be telephone dialing and ringing tones.
4. Proceed with the call.
5. Press **End**, or give a long press on the function key, to end the call—the radio may send tones to release the line.

Using the main menu

1. Select the required channel.
2. Press **Menu** and select **Dial patch call**.
3. Dial the required number using the alphanumeric keys.
4. Press **Send**—the radio may send tones to capture the line.
5. Press **Send** to send the number dialed in step 3—there may be telephone dialing and ringing tones.
6. Once the call has finished, press **End**—the radio may send tones to release the line.

Dialing DTMF tones (overdialing)

The radio may be programmed to allow dialing of DTMF tones using the numeric keypad while on a channel or in a call. The dialing may be either sent out immediately as it's typed, or sent after pressing **Send**.

6.1.3 Call alert

Users can let other radio users know they wish to communicate by sending them a call alert page. When the other radio user receives the call alert page, they can call back when it is convenient.

If on a DMR conventional channel, users can send a call alert to any other radio on the same channel.

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Sending a call alert page

1. Press **Menu** and select **Services > Call alert**.

> Users can also send a call alert from the **Options > Services** menu of an address book entry.

If an address book is configured, it's possible to select to either dial a number or show the address book. Otherwise a preset list of radios will appear.

2. Select the desired radio to page.
3. Press **Send to**.

> A message showing the radio destination appears on the display. The LED glows red, and a notification indicates whether the message was sent successfully.

If an acknowledgment is not received from the recipient's radio, users will have the option of either canceling or resending the request.

Answering a call alert page

If a call alert page is received from another radio user, **Call alert** and the caller name appears onscreen.

Select **Call** to return the page, or select **Clear** to delete it.

If the call alert page is missed, a call alert entry is added to the queue. See Checking the queue on page 51.

6.1.4 Radio monitor

The radio unit monitor feature can be used when concerned about the safety of a radio user on the same DMR conventional channel. When sending a radio-unit monitor request to a radio, it calls the user back without giving any indication that it is making a call. Users can hear any activity near the radio for up to 120 seconds.

To send a radio unit monitor request:

1. Press **Menu** and select **Services > Radio monitor**.

> Users can also send a radio unit monitor request from the **Options** menu of an address book entry.

2. If an address book is configured, it is possible to select to either dial a number or show the address book. Otherwise a preset list of radios will appear.
3. Scroll to the radio to be monitored.
4. Press **Send to**.

> A message showing the radio destination appears on the display. The LED glows red, and a notification indicates whether the message was sent successfully.

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If the other radio has received the user's request, it will now call them so they can monitor activity near the radio.

If an acknowledgment is not received from the recipient's radio, the user will have the option of either canceling or resending the request.

> If Active Noise Cancellation is turned on, the user may not be able to hear any background noise.

6.1.5 Sending and receiving status messages

A status message is sent to another party to indicate current activity or location, such as "en route" or "at lunch". If the radio receiving the message has been programmed with the same status messages, it will decode and display the message. If a status message is received, the message is automatically queued, since a response is not expected. Status messages can also be used to control external devices.

Sending a status message

1. Press **Menu** and select **Services > Status update**.
2. In the **Status update** menu, scroll through the list of status messages until the desired message appears.
3. When a message has been chosen, press **Select**.

> Depending on how radio is programmed, the message may be sent directly to a pre-configured radio or group, or the user will be presented with options to select a destination.

The call details appear on the display.

Receiving a status message

If the radio is programmed for call queuing, incoming status messages are added to the queue. For more information, see Checking the Queue.

1. Press **Options** and select whether to reply, call, or delete.

The radio may be programmed to automatically view status messages on receipt.

If the radio is not programmed for call queuing, incoming status messages are displayed briefly.

6.2 Using the Radio in Different Repeater Areas

The radio may have a group of channels programmed as a voting group. The channels in the voting group all carry the same traffic, but from different repeaters. As the radio moves in and out of different repeater coverage areas, the best communication channel is automatically selected for use.

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This channel is known as the ‘home’ channel, and will be the channel used to make and receive calls. While voting is active, the scanning icon appears on the display.

> For DMR channels, Selecting a scanning or voting group on page 87 explains how to select a group. A group can be either a voting or a scanning group.

6.2.1 Selecting a voting group

Using the channel selector

Users can use the channel selector to select a preset voting group.

If the radio is programmed in this way rotate the channel selector to the group you want.

Using a function key

To use a function key to select a voting group press the **function key** to select and activate a preset voting or scanning group.

Using the main menu

To select a voting group using the Main menu:

1. Press **Menu** and select **Channels**.
2. Scroll to the group you want and press **Select**.

6.2.2 Suspending a channel from a voting group

Users may be able to use the function key programmed for nuisance delete to temporarily delete one of the channels from the voting group.

When that voting group is next selected, or after the radio has been turned off and then on, the deleted channel is again part of the voting group.

Alternatively, the function key programmed for voting may be programmed so that a short key press turns on voting, and a long key press activates nuisance delete.

Press and hold the **function key** programmed for voting to remove the current channel from the voting group.

If the operation has been successful, the message "Channel nuisance deleted" appears on the display.

6.3 Analog Channel Operation Only

The following sections detail features that are only available when operating on a conventional analog channel.

6.3.1 Setting the radio's status

The radio may be able to maintain a record of its current status. This status may be sent with outgoing calls programmed to contain status information. If the radio receiving the call has

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been programmed with the same status messages, it will decode and display its status. The status indicates the current activity or location, such as “en route” or “at lunch”.

To set the radio's status:

1. Press **Menu** and select **Set status**.
2. In the Set status menu, scroll through the list of status messages until the desired message appears.
3. Press **Select**.

   The message "Status updated" appears on the display.

6.3.2 Automatically resending calls

On an analog channel that is configured for SelCall/5-Tone operations, the radio may have been programmed to resend individual and group calls when transmission is refused because the channel is busy.

There are two automatic callback features:

- Deferred calling
- No acknowledgment retries

Deferred calling

When attempting to make a call on a channel that is busy, the radio can store and send the call once the channel is free. The radio gives a low-pitched beep, and then waits until the channel is free to retry the call.

A deferred calling time limit may have been configured. Once the time limit has expired the radio will no longer attempt to retry the call. Any user interaction—such as pressing PTT—will cancel a deferred call.

No acknowledgment retries

When a call is sent and there is no reply, the call is resent. Any user interaction—such as pressing PTT—will cancel a call that is being resent.

6.3.3 Using monitor and squelch override

The monitor function allows the user to override some or all of the radios' mutes and hear if there is any traffic on a channel before making a call.

The squelch override function allows the user to override the squelch (carrier) mute and hear all noise on a channel, including weak signals that are below the programmed squelch threshold.

Turning monitor override on and off

1. Press **Menu** and select **Radio settings > Functions > Monitor**.
2. Scroll to **On**or **Off** and press **Select**.

While monitor is on, the LED slowly flashes green and the monitor icon appears on the display.

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The radio may be programmed so that monitor turns off automatically after a short time.

Turning squelch override on and off

1. Press **Menu** and select **Radio settings > Functions > Squelch o'ride**.
2. Scroll to **On**or **Off** and press **Select**.

   This allows even faint and noisy signals to be heard.

While squelch override is on, the LED flashes green, and the squelch override icon appears on the display. Squelch cannot be overridden if the radio is scanning.

> Monitor and Squelch override are often programmed as short and long keypresses on the same function key.

6.3.4 Using repeater talkaround

Repeater talkaround allows users to bypass the radio repeater and communicate directly with another radio on an analog channel. This can be done, for example, when the radio is out of range of the repeater, if the repeater is busy, or it stops working.

While repeater talkaround is active, all transmissions are made on the receive frequency of the channel currently in use.

To turn on repeater talkaround:

1. Select the required channel.
2. Press **Menu** and select **Radio settings > Functions > Talkaround**.
3. In the Talkaround menu, choose **On**.
4. Press **Select**. The message "Talkaround activated" appears briefly.

   The repeater talkaround icon appears on the display.
5. Proceed with the call.

To turn talkaround off, select **Off** from the Talkaround menu, or change channels.

6.4 DMR Channel Operation Only

The following sections detail features that are only available when operating on a conventional DMR channel.

6.4.1 Making a preset call

The radio may be programmed to use a function key to initiate a call to an individual or group that may or may not be part of the current talkgroup, e.g. the dispatcher.

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6.4.2 Sending and receiving text messages

The radio may be programmed to send text messages by selecting a preset text message, editing a draft text message, or creating a new text message.

Using the alphanumeric keys to enter text

When the alphanumeric keys are used to enter a text message, they have special functions.

- Use the **#** key to select the type of text entry:
  - upper and lower case characters (**ABC**, **abc**)
  - initial capitals (**Abc**)
  - numbers (**123**)
- use the left selection key (**Clear**) to delete a character from the display
- use the scroll keys to move through a message

Repeated presses of these keys will provide the characters shown in the following table:

Table 6.1 Alphanumeric keys with corresponding characters

Key	Characters						
1	.	,	?	!	-	/	1
2 ABC	A	B	C				2
3 DEF	D	E	F				3
4 GHI	G	H	I				4
5 JKL	J	K	L				5
6 MNO	M	N	O				6
7 PQRS	P	Q	R	S			7
8 TUV	T	U	V				8
9 WXYZ	W	X	Y	Z			9
0	space						0

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Creating a new text message

1. Press **Menu** and select **Services > Text message > New message**.
2. Use the alphanumeric keys to add characters and the **Clear** key to delete them. Use the scroll keys to move through the characters.
3. When the message is complete, press **Options > Send**.

> If canceling out of editing a text message or receiving a call while editing, the current draft will be saved and is available for editing later.

Editing a draft text message

1. Press **Menu** and select **Services** > **Text message** > **Edit message**.
   The last sent or edited text message will appear.
2. Use the scroll keys to move through the characters. Use the alphanumeric keys to add characters and the **Clear** key to delete them.
3. When the message is complete, press **Options** > **Send**.

Sending a text message

1. When a message has been chosen or entered, press **Options**. The **Text options** menu opens.
2. In the **Text options** menu, scroll through the list of options until the desired one appears.
3. Select **Send** and press **Select**.
4. If an address book is configured, it's possible to either dial a number or show the address book. Otherwise a preset list of radios will appear.

The call details appear on the display.

Sending a preset text message

1. Press **Menu** and select **Services > Text message > Preset message**.

   In the Preset message menu, a short label representing each message is displayed.
2. Scroll through the list of preset message labels until the desired one appears.
3. Press **Select**, and the chosen text message is displayed.
4. Press **Send** to send the message, or **Edit** to change the message.

   Pressing the **scroll up key** will place the cursor at the start of the message.

   Pressing the **scroll down key** will place the cursor at the end of the message.
5. When the message is complete, press **Options > Send**.

Receiving a text message

If the radio is programmed for call queuing, incoming text messages are added to the queue. For more information, see Checking the queue on the next page.

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Press **Options** and select whether to reply, call, or delete.

The radio may be programmed to automatically view text messages when they are received.

If the radio is not programmed for call queuing, incoming text messages will not be stored or displayed.

6.4.3 Checking the queue

If an incoming call or call alert has been missed, or if a status message or text message has been received, it may be stored in the queue.

The queue icon appears and information about the missed call or message may be shown on the display. The queue can be programmed to store multiple calls or messages, or just the last call or message.

Press **Options** to either view, reply, call back, look at the entry details, or delete the entry.

The radio may also be programmed to automatically view the full status update or text message on receipt.

If there are calls or messages in the queue, the radio may emit a warble tone for a period of time. The notification starts again when the radio is restarted or another call is received.

To access the queue:

1. Press **Menu > Call queue**.
2. Use the scroll keys to move through the calls or messages in the queue until the desired item appears.
3. Press **Options**.

   The available options depends on the call type:

   - for voice calls, select **Call** to return the call
   - for status or text messages, select:
     - **View** to read the message.
     - **Reply** to respond to the message.
     - **Call** to return the call.

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7 Operating on a DMR/MPT Trunked Network

This section explains how your radio operates on a DMR (digital), MPT (analog) or dual-mode trunked network.

> Some features in this section are controlled by software licenses (SFE) and may not be available with your radio.

7.1 Checking Network Availability

Check that the orange LED is flashing and the network icon appears on the display. These are the indications that your radio has access to a trunked network.

7.1.1 No Service

If the network icon is flashing and "No service" appears on the display, your radio is attempting to access the trunked network. If this icon continues to flash, your radio may be out of the network coverage area.

7.1.2 Limited Service

If "Limited service" appears on the display, one of the network sites or the connection between the network sites has been interrupted. You can still make calls to radios covered by the same site but not to radios on other sites.

7.2 Changing a Network

Your radio may be programmed to operate in up to four completely separate trunking networks, either DMR (digital), MPT (analog) or both (dual mode). You may wish to change networks because you are out of the network coverage area, or you need to have access to another trunking network.

To change your radio's operating network, you may be able to either use the Main menu or dial the new network using the alphanumeric keys.

To change the operating network:

1. Press **Menu** and select **Change network**.
2. In the **Change network** menu, scroll through the list of networks until the network you want appears.
3. Press **Select**.

   The radio will restart and display the name of the new network.

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> Changing the radio's workgroup may also change the network in which you are operating. See Selecting a workgroup on the next page.

7.3 Dialing a New Network

This feature is only available for radios with alphanumeric keys.

1. Dial ***700#** to display the name of the current trunked network.
2. Dial ***70n#** to change to a new network, where **n** is the number of the new network—1 to 4.

   The radio will restart and display name of the new network.

7.4 About Trunked Zones and Workgroups

Trunked zones and workgroups are used to manage the calls on the trunked system. Zones, if used, typically define geographic areas (towns, suburbs or counties), or branches of an organization. Workgroups span multiple zones, and typically define functions, work areas or job roles.

When your radio belongs to a workgroup, it is said to be 'subscribed', and you receive all calls directed to that group of users. A group's members are dynamic, in that a group only contains radios that are currently registered on the system and subscribed to the same group.

> Your radio may be programmed to use different names for a zone and workgroup. For example, 'district' or 'area' may be used in place of zone, and 'role' or 'group' may be used in place of workgroup.

7.4.1 Selecting a zone

1. Press **Menu** and select **Set zone**.

   Depending on how your radio is programmed, you may be able to use the scroll keys or left selection key to select a zone.
2. In the **Set zone** menu, scroll through the list of zones until the zone you want appears.
3. Press **Select**.
4. Check that the network icon appears on the display.

7.4.2 Automatic zone selection

Your radio may be configured to change zones automatically based on your location.

Selecting a zone manually as described above will end automatic mode, and the manual mode icon will appear on the display.

Your radio may be configured to use a timer or a function key to return to automatic mode.

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7.4.3 Selecting a workgroup

1. Press **Menu** and select **Set workgroup**.

   Depending on how your radio is programmed, you may be able to use the scroll keys, left selection key, 3-way selector, or channel selector to select a workgroup.

2. In the **Set workgroup** menu, scroll through the list of workgroups until the workgroup you want appears.
3. Press **Select**.
4. Check that the network icon appears on the display.

7.4.4 Making a call to a workgroup

Different types of calls may be associated with your workgroups. These calls can be any types of calls.

To make a call to a workgroup:

1. Select the required zone. See Selecting a zone on the previous page.
2. Select the required workgroup. See Selecting a workgroup above.
3. Press the **PTT key**, and a call to that workgroup is made.

7.4.5 Dialing a workgroup call

> This feature is only available for radios with alphanumeric keys.

It may be possible to dial workgroup calls, if you know the number associated with the workgroup.

1. Dial **w**, where **w** is the number of the workgroup.

   If your workgroup call number is the same as a call to another radio, then you need to dial a leading **0**. For example, dial **23#** to call radio 23 and dial **023#** for workgroup call number 23.

2. Press **Send** or the **#** or PTT key.

   While the call is being setup, you can cancel the call by pressing **Cancel**.

7.4.6 Selecting the homegroup

Your homegroup is the workgroup in which your radio usually operates.

Using the Main menu

1. Press **Menu** and select **Go to homegroup**.
2. Press **Select**, and the radio now shows your homegroup in the default display.

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Using function keys

You may be able to use function keys to go to your homegroup or to toggle between your homegroup, and the currently selected zone and workgroup.

- press the function key programmed to go to your homegroup.The radio now shows your homegroup on the default display
- press the function key programmed to toggle between your homegroup and the currently selected zone and workgroup. The radio now shows your homegroup on the default display, along with the homegroup icon .

> The homegroup icon only appears if you use a function key to toggle between your homegroup and the currently selected zone and workgroup.

7.4.7 Scanning workgroups

The My Workgroups list comprises the current workgroup, the homegroup, and other programmed groups. When scanning is active, the radio will receive activity from any subscribed groups in the My Workgroups list.

To activate scanning:

1. Press **Menu** and select **Scanning**.

   Depending on how your radio is programmed, you may be able to use a function key to turn scanning on or off.

2. Scroll to **On** or **Off** and press **Select**.

7.5 Making a Call Using the Address Book

The Address book menu programmed for your radio can contain calls to other radios, PABX extensions, or to PSTN numbers.

To use the Address book to make a call:

1. Press **Menu** and select **Address book**.

   Depending on how your radio is programmed, you may be able to use the scroll keys, left selection key or a function key to select the Address book.

2. In the Address book menu, scroll through the list of calls until the contact you require appears.

3. Press **Options** , then select **Call**, or press the **PTT key**.

Address book calls may also be used to send status information, such as “at lunch” or “on site”, or to change to a channel or group. For more information, see Using the Address Book on page 30.

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7.6 Making a Preset Call

The preset calls programmed for your radio may be to other radios, to PABX extensions or to PSTN numbers.

To make a preset call:

1. Press **Menu** and select **Preset calls**.

   Depending on how your radio is programmed, you may be able to use a function key, or left selection key to select the **Preset calls** menu.

2. In the **Preset calls** menu, scroll through the list of calls until the call you want appears, then press **Send**.

   While the call is being setup, you can cancel the call by pressing **Clear**.

7.6.1 Dialing a Preset Call

This feature is only available for radios with alphanumeric keys.

It may be possible to dial preset calls, if preset calls are programmed for your radio and you know the number associated with the preset call.

To dial a preset call:

1. Dial **p**, where **p** is the number of the preset call.

   If your preset call number is the same as a call to another radio, dial a leading **0**. For example, dial **23#** to call radio 23 and dial **023#** for preset call number 23.

2. Press **Send** or the **#** or **PTT key**.

   While the call is being setup, you can cancel the call by pressing **Cancel**.

7.7 Receiving a Call

When you receive a call on a trunked network, your radio may:

- automatically accept the call.

  The GO icon appears on the display. The radio may also be programmed to beep or ring. In this case, the caller will usually talk first.

- ring like a telephone. Press **Answer** to accept the call.

  The radio gives a beep and the GO icon appears on the display.

  You may also be able to accept the call if you press the **PTT key** or lift the microphone off the microphone clip. In this case, you will usually talk first.

Once the GO icon appears, you can proceed with the call, as follows:

1. Hold the microphone about 2 inches (5cm) from your mouth.

2. Press and hold the **PTT key** to transmit.

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3. Speak clearly into the microphone and release the **PTT key** when you have finished talking.
4. End the call by pressing **End**.

   The network may also end the call if neither you nor the other party transmits for a predetermined time or if your call time limit is exceeded.

7.7.1 Transmit timer

Your radio may have a transmit timer that limits the amount of time you can transmit continuously.

When the transmit timer is about to expire, the message "Transmit timeout imminent" appears in the display, the LED flashes red, and the radio emits three beeps.

If the transmit timer times out, the call clears down.

7.7.2 Call time limit

Tthe length of a call may be limited by the network or by your radio. The radio may be programmed to display the time remaining for the call.

7.8 Re-establishing a Call

The last number recall, unanswered call and callback functions may allow you to re-establish calls using the PTT key.

7.8.1 Last number recall

When an outgoing call has ended, the message **Last call to** and the called unit's identity may appear on the display.

To make a call to that person again, briefly press the **PTT key**.

7.8.2 Unanswered call

When an incoming call is missed, the message **Missed call** and the caller's identity may appear in the display.

To return the call, briefly press the **PTT key**.

7.8.3 Callback

When an incoming call has been ended, the message **Last call from** and the caller's identity may appear in the display.

To make a call to that person, briefly press the **PTT key**.

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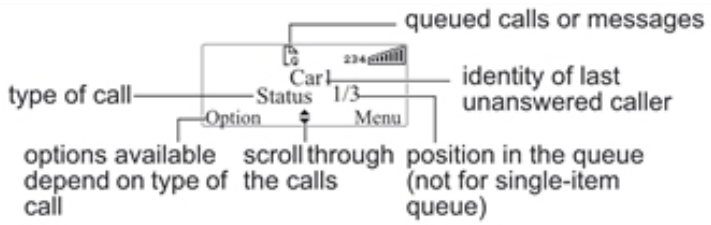
7.9 Checking the Queue

If you have missed an incoming call or call alert, or if you received a status message or text message, it may be stored in the queue. The queue icon appears and information about the missed call or message may be shown on the display.

The queue can be programmed to store multiple calls or messages or just the last call or message.

In the example below, a status message was received from Car 1. This is the first of three calls or messages stored in the queue:



Press **Options** to either view, reply, call back, look at the entry details, or delete the entry.

Your radio may be also programmed to automatically view the full status update or text message on receipt.

If there are calls or messages in the queue, the radio may emit a warble tone for a period of time. The notification starts again when the radio is restarted or another call is received.

7.9.1 Accessing the queue

1. If the call or message information is not shown already, press **Menu > Call queue**.
2. Use the scroll keys to move through the calls or messages in the queue until the item you want appears.
3. Select **Options**.

   The options available depend on the type of call:

   - for a voice call, select **Call** to return the call.
   - for a status message or a text message, select **View** to read the message, **Reply** to reply, or **Call** to return the call.

Your radio may be also programmed to automatically view the full status update or text message on receipt.

You can also delete the selected call or messages, or delete all queued calls and messages.

7.9.2 Changing your queue settings

Your radio may be programmed so that you are able to change queuing between “unanswered” and “full”.

In “unanswered” queuing, incoming individual voice calls are only queued if unanswered.

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In “full” queuing, incoming individual voice calls are queued immediately and you don’t get an option to answer the call.

In both cases, all status and text messages are queued immediately.

If your radio has alphanumeric keys, you may be able to change your call queuing setting using the keypad.

To activate “full” queuing:

1. Press **Menu** and select **Radio settings > Call settings > Call queuing** and choose **On**.
2. Press the function key programmed for Call queuing, or
3. Dial ***48** then press the **#** or PTT key

   The message **Call queuing activated** appears.

To change call queuing to “unanswered” queuing:

1. Press **Menu** and select **Radio settings > Call settings > Call queuing** and choose **Off**.
2. Press the function key programmed for Call queuing, or
3. Dial **#48** then press the **#** or **PTT key**

   The message **Call queuing deactivated** appears.

7.10 Status Messages

A status message is sent to another party to indicate your current activity or location, such as “en route” or “at lunch”. If the radio receiving your message has been programmed with the same status messages, it will decode and display your message. If you receive a status message, the message is automatically queued, since a response is not expected.

7.10.1 Selecting a status message

1. Press **Menu** and select **Send > Status**.
2. In the **Status** menu, scroll through the list of status messages until the message you want appears.

7.10.2 Sending a status message

1. When you have chosen a message, press **Send** and the **Send to** menu opens.
2. In the **Send to** menu, scroll through the list of options until the choice you want appears.

   If your radio has alphanumeric keys, you can choose the option **Dialed**, then dial the number of the party you wish to call.

   If you select **Address book** or **Preset,** scroll to the entry you want and press **Select**.
3. Press **Select**.

   The call details appear on the display. While the call is being setup, you can cancel the call by pressing **Cancel**.

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7.10.3 Dialing a status message

If your radio has alphanumeric keys, the status messages programmed for your radio can be dialed. To dial the message, you need to know the number associated with the status message.

To dial a status message:

1. Dial ***0s*n**, where **s** is the number of the status message and **n** is the radio unit number you wish to send the message to.
2. Alternatively, dial ***0s*p**, where **p** is the number of a preset call or workgroup. See Making a preset call on page 48 or Dialing a workgroup call on page 54 for more information.
3. Press **Send** or the **#** or **PTT key**.

   The call details appear on the display. While the call is being setup, you can cancel the call by pressing **Cancel**.

7.10.4 Receiving a status message

If the radio is programmed for call queuing, incoming status messages are added to the queue. For more information, see Checking the queue on page 51.

1. Press **Options** and select whether to reply, call or delete.
2. Your radio may be programmed to automatically view status messages on receipt.
3. If the radio is not programmed for call queuing, incoming status messages will not be stored or displayed.

7.11 Trunked Text Messages

Your radio may be programmed so that you can send text messages. The three options for creating text messages are selecting a preset text message, editing a draft text message, or creating a new text message.

> To either edit or enter a text message, your radio must have alphanumeric keys.

7.11.1 Using the alphanumeric keys to enter text

When the alphanumeric keys are used to enter a text message, they have special functions.

- Use the **#** key to select the type of text entry: upper and lower case characters (**ABC**, **abc**), initial capitals (**Abc**), or numbers (**123**).
- Use the left selection key (**Clear**) to delete a character from the display.
- Use the scroll keys to move through a message.

Repeated presses of these keys will display the characters shown in Table 6.1 on page 49.

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7.11.2 Sending a preset text message

1. Press **Menu** and select **Send > Text message > Preset message**.

   In the **Preset message** menu, a short label representing each message is displayed.
2. Scroll through the list of preset message labels until the one you want appears.
3. Press **Select**, and the text message you have chosen is displayed.
4. Press **Send** to send the message, or **Edit** to change the message.

   Pressing the **scroll up key** will place the cursor at the **start** of the message.

   Pressing the **scroll down key** will place the cursor at the **end** of the message.

7.11.3 Creating a new text message

1. Press **Menu** and select **Send > Text message > New message**.
2. Use the alphanumeric keys to add characters and the **Clear** key to delete them.

   Use the scroll keys to move through the characters.
3. When the message is complete, press **Options** and select **Send**.

   If you decide to cancel out of editing a text message or receive a call while editing, the current draft will be saved and is available for editing later.

7.11.4 Sending a text message

1. When you have finished editing the message, press **Options**.

   The **Text options** menu opens.
2. In the **Text options** menu, select **Send**.
3. In the **Send to** menu, scroll through the list of options until the choice you want appears.

   If your radio has alphanumeric keys, you can choose the option **Dialed**, then dial the number of the party you wish to call.

   If you select **Address book** or **Preset**, scroll to the entry you want and press **Select**.
4. Press **Select**. The call details appear on the display.

   While the call is being setup, you can cancel the call by pressing **Cancel**.

7.11.5 Editing a draft text message

1. Press **Menu** and select **Send** > **Text message** > **Edit message**.

   The last sent or edited text message will appear.
2. Use the scroll keys to move through the characters. Use the alphanumeric keys to add characters and the **Clear** key to delete them.
3. When the message is complete, press **Options** and select **Send**.

If you decide to cancel out of editing a text message or receive a call while editing, the current draft will be saved and is available for editing later.

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7.11.6 Receiving a text message

If the radio is programmed for call queuing, incoming text messages are added to the queue. For more information, see Checking the queue on page 51.

Press **Options** and select whether to reply, call or delete.

Your radio may be programmed to automatically view text messages on receipt.

If the radio is not programmed for call queuing, incoming text messages will not be stored or displayed.

7.12 Placing the Radio in Do-Not-Disturb Mode

If you do not want calls for a while, you can place the radio in do-not-disturb mode, so that incoming calls can be ignored. You can make outgoing calls in the usual way.

While do-not-disturb mode is active, incoming calls cannot be stored in the call queue.

Using a function key

See Accessing Menu Items with Function Keys on page 27.

1. Press the **function key** programmed for do not disturb, to activate the do-not-disturb function.

   The message "Do not disturb activated" appears on the display. Your radio will now ignore all incoming calls.

2. To deactivate the do-not-disturb function, press the do-not-disturb **function key** again.

   The message "Do not disturb deactivated" appears on the display.

Using the Main menu

1. Press **Menu** and select **Radio Settings > Call Settings > Do not disturb**.
2. In the **Do not disturb** menu, choose **On**.
3. Press **Select**.

   The message "Do not disturb activated" appears on the display.

   Your radio will now ignore all incoming calls.

7.13 Switching to Conventional Channels or Conventional Groups

You may be able to dial conventional channels or groups, using **101** to **110**. The channels or groups called using these numbers are programmed for your radio.

To call a conventional channel or group:

1. Dial the number for the channel or group you wish to call.

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2. Press **Send** or the **#** or **PTT key**.

   Your radio switches to the conventional channel programmed for that number.

7.14 Dialing Calls in DMR Trunked Mode

If your radio has alphanumeric keys, you can make dialed calls from your radio. The numbers you dial and dialing features available depend on the way your radio is programmed and the way your network operates.

Contact your radio provider for further assistance.

7.15 DMR Dialing

If your trunked network uses the DMR dialing scheme, your radio's unique number on the network consists of:

- a three-digit prefix
- a two-digit fleet number, and
- a three-digit unit number.

You may also be part of a group, with a three-digit group number.

7.15.1 Finding your radio's DMR number

To find your radio's full DMR number:

1. Dial ***700**.
2. Press the **#** or **PTT key**.

   The name associated with your network and your radio's full DMR number appears.

   The number is in the form:

7.15.2 DMR dialed calls

Table 7.1 on the next page summarizes the way you dial calls to other radios and groups of radios using the DMR dialing scheme, and gives an example of each type of call.

> In the following examples, the final **#** may be replaced by a short press of the **PTT key**.

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Table 7.1 DMR dialing examples

Call to	Dialing code and example
Radio **332** in the same fleet as you	Radio unit number 332 #
Radio **521** in the same fleet as you	Radio unit number 521 #
Radio **332** in fleet **78** with the same prefix as you	Fleet 78 Radio unit number 332 #
Radio **521** in fleet **78** with the same prefix as you	Fleet 78 Radio unit number 521 #
Radio **332** in fleet **78** with a different prefix to you (**350**)	Prefix 350 Fleet 78 Radio unit number 332 #
Group **990** in the same fleet as you	Group 990 #
Group **923** in the same fleet as you	Group 923 #

7.16 MPT 1343 Dialing

If your MPT or DMR trunked network uses the MPT 1343 dialing scheme, your radio's unique number on the network consists of:

- a three-digit prefix.
- a four-digit fleet number.
- a two- or three-digit radio unit number.

You may also be part of a group, with a two- or three-digit group number.

7.16.1 Finding your radio's MPT number

To find your radio's full MPT number:

1. Dial ***700**.
2. Press the **#** or **PTT key**.

   The name associated with your network and your radio's full MPT number appears.

   The number is in the form:

   Prefix 300 Fleet 3078 Radio unit number 234

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7.16.2 MPT 1343 dialed calls

Table 7.2 below summarizes the way you dial calls to other radios and groups of radiosusing the MPT 1343 dialing scheme, and gives an example of each type of call.

> In the following examples, the final # may be replaced by a short press of the PTT key.

Table 7.2 MPT 1343 dialing examples

Call to	Dialing code and example
Radio **23** in the same fleet as you	Radio unit number 23 #
Radio **234** in the same fleet as you	Radio unit number 234 #
Radio **23** in fleet **3078** with the same prefix as you	Fleet 3078 Radio unit number 23 #
Radio **234** in fleet **3078** with the same prefix as you	Fleet 3078 Radio unit number 234 #
Radio **234** in fleet **3078** with a different prefix to you (**300**)	Prefix 300 Fleet 3078 Radio unit number 234 #
Group **92** in the same fleet as you	Group 92 #
Group **923** in the same fleet as you	Group 923 #

7.17 Nokia ANN Fleet Calls

If your trunked network uses Nokia ANN dialing, the numbers you dial depend on your fleet size. Fleets are defined as either large, small or mini. Your radio's unique number on the network consists of:

- a lead number **7**, **8** or **9**, depending on the fleet size,
- a zero-, one-, two- or three-digit prefix,
- a one- or two-digit fleet number,
- a two- or three-digit radio unit number.

See your radio provider or network administrator for Nokia ANN call details.

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7.17.1 Finding your radio's Nokia ANN number

To find your radio's full Nokia ANN number:

1. Dial ***700**.
2. Press the **#** or **PTT key**.

   The name associated with your network and your radio's full Nokia ANN number appears.

   The number is in the form:

   [Lead 7] [Prefix 34] [Fleet 2] [Radio unit number 209]

7.17.2 Nokia ANN dialed calls

Table 7.3 below summarizes the way you dial calls to other radios and gives an example of each type of call.

> In the following examples, the final **#** may be replaced by a short press of the **PTT key**.

Table 7.3 Nokia ANN dialing examples

Call to	Dialing code and example
Radio **23** in the same fleet as you Group **923** in the same fleet as you	[Radio unit number 23] [#] [Group 923] [#]
Large fleet: Call to radio **234** in fleet **1** with the same prefix as you Call to radio **235** in fleet **2** with a different prefix to you (**32**)	[Lead 7] [Fleet 1] [Radio unit number 234] [#] [Lead 7] [Prefix 32] [Fleet 2] [Radio unit number 235] [#]
Call to radio **236** in fleet **2** with the same lead and prefix[a]	[Fleet 2] [Radio unit number 236] [#]

[a] If 4-digit-dialing is configured in the programming application.

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Call to	Dialing code and example
Small fleet: Call to radio **23** in fleet **51** with the same prefix as you Call to radio **24** in fleet **52** with a different prefix to you (**126**) Call to radio **25** in fleet **53** with the same lead and prefix[a]	Lead 7 Fleet 51 Radio unit number 23 # Lead 7 Prefix 126 Fleet 52 Radio unit number 24 # Fleet 53 Radio unit number 25 #
Mini fleet: Call to radio **23** in fleet **80** with the same prefix as you Call to radio **24** in fleet **81** with a different prefix to you (**3**) Call to radio **25** in fleet **81** with the same lead and prefix[a]	Lead 7, 8 or 9 Fleet 80 Radio unit number 23 # Lead 7, 8 or 9 Prefix 3 Fleet 81 Radio unit number 24 # Fleet 81 Radio unit number 25 #

7.17.3 Dialing a PSTN Number

Dialing is only available for radios with alphanumeric keys.

To dial a PSTN number:

1. Dial **0n**, where **n** is the PSTN number you wish to call.

   The numbers you dial before the 0 depend on the way your network operates.

2. Press **Send** or the **#** or **PTT** key. The call details appear on the display.

   While the call is being setup, you can cancel the call by pressing **Cancel**.

7.17.4 Dialing a PABX Number

Dialing is only available for radios with alphanumeric keys.

To dial a PABX extension:

1. Dial **n**, where **n** is the PABX extension you wish to call.

2. Press **Send** or the **#** or **PTT key**.

The call details appear on the display. While the call is being setup, you can cancel the call by pressing **Cancel**.

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7.18 Accessing Common Trunking Functions

7.18 above explains how to access special DMR or MPT trunking functions using the and # keys. The availability of these functions is dependant on the way your radio is programmed and the way your network operates.

In the following examples, the final # may be replaced by a short press of the **PTT key**.

Table 7.4 Trunking functions

*...# functions		
Dialing code	**Functions**	**Example**
#	Accept an incoming Full Off Air Call Setup (FOACSU) call	
***#**	Clear call or displayed item, or decline an incoming FOACSU call	
***0#** **#0#**	Request base dispatcher to call you back Cancel request	
***0*n#** **#0*n#**	Request another dispatcher to call you back Cancel request	***0*234#** **#0*234#**
***0s*n#** ***0s#**	Status call to radio **n** (**s** = status 0 to 31, MPT, or 0 to 127, DMR) Status call to dispatcher	***015*23#** ***015#**
g#	Conference call to group **g**	**92#**
***11*g#**	Broadcast call to group **g**	***11*92#**
***41*n#** **#41#**	Divert own calls to radio **n** Cancel divert	***41*23#**
***41*0n#** **#41#**	Divert own calls to PSTN **n** Cancel divert	***41*03456798#**
***44*n*m#** [a]	Divert 3rd party calls **n** to **m**	***44*23*21#**
44*n# [a]	Cancel divert of 3rd party calls	**#44*23#**
***441*m#** **#441#**	Divert of speech calls to **m** Cancel divert of speech calls	***441*21#** **#441#**
***442*m#** **#442#**	Divert of packet data calls to **m** Cancel divert of packet data calls	***442*21#** **#442#**

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*...# functions		
Dialing code	**Functions**	**Example**
***451#** ***452#** ***453#** [b] ***454#** [b]	Cancel incoming call diversions (speech only) Cancel incoming call diversions (packet data only) Cancel incoming call diversions (SDM only) Cancel incoming call diversions (status only)	
***46#** [c] ***461#** [c] ***462#** [c]	Toggle encryption Turn encryption off Turn encryption on	
***47#** [c]	Display the current network and your full radio number	
***48#** **#48#**	Queue incoming calls Cancel queue	
***49#** **#49#**	Do not disturb Cancel do not disturb	
***491#** **#491#**	DMR: Do not disturb (SDM calls) MPT: Do not disturb (voice calls only) DMR: Cancel do not disturb (SDM calls) MPT: Cancel do not disturb (voice calls only)	
***492#** **#492#**	Do not disturb—data calls only Cancel do not disturb—data calls only	
***50*n#** [a]	Select channel **n** (site-select diagnostic function, enabled during programming)	
***50*xnnnnn#** [b]	Select channel **xnnnn**, where **x** is the logical channel and **nnnn** is the physical channel (site-select diagnostic function, enabled during programming)	
#50#	Resume normal channel hunting (site-select diagnostic function, enabled during programming)	
***700#**	Display the current network and your full radio number	
***70n#**	Change to network **n** (1 to 4)	***702#**
***8*n#** [d]	Priority call (DMR: highest, MPT: high) to radio **n**	***8*23#**
***8*g#** [d]	Priority conference call (DMR: highest, MPT: high) to group **g**	***8*923#**

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*...# functions		
Dialing code	**Functions**	**Example**
***81*n#** [d]	Priority call (DMR: highest, MPT: high) to radio **n**	***81*23#**
***81*g#** [d]	Priority conference call (DMR: highest, MPT: high) to group **g**	***81*923#**
***82*n#** [d]	Priority call (DMR: high) to radio **n**	***82*23#**
***82*g#** [d]	Priority conference call (DMR: high) to group **g**	***82*923#**
***83*n#** [d]	Priority call (DMR: medium) to radio **n**	***83*23#**
***83*g#** [d]	Priority conference call (DMR: medium) to group **g**	***83*923#**
***9*n#**	Emergency call to radio **n**	***9*23#**
***9*g#**	Emergency conference call to group **g**	***9*923#**
****n#** [a]	Abbreviated dialed codes (1-49)	****3#**

[a]MPT only.

[b]DMR only.

[c]DMR dialing scheme only.

[d]DMR has three priority levels and MPT has one priority level. *8 and *81 are interchangeable. Dialing *82 or *83 in MPT mode has the same effect as dialing *8 or *81.

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8 Operating on a P25 Trunking Network

This section explains how the radio operates on a P25 trunking system.

> Some features in this section are controlled by software licenses (SFE) and may not be available with your radio.

8.1 Trunking System Availability

When you first switch to a talkgroup configured for P25 trunking, the radio attempts to access the network and register on a control channel.

Successful registration

If registration is successful, the trunking system available icon appears on the display

Unsuccessful registration

If registration is not successful, does not appear, and the display shows "No service".

The radio may sound five beeps, followed by a repeating double beep. The double beep continues until registration is successful.

Lost service

If access to the trunking system is lost, no longer appears, the RSSI icon disappears, and the display shows "No service".

The radio sounds five beeps to indicate the loss of service, followed by a repeating double beep. The double beep continues until service is restored.

Site Trunking

During normal trunking operation, the radio may roam between a number of sites. This behavior is transparent to you, unless there is a problem with a system controller. When this happens, the radio enters site trunking mode, and you will only be able to communicate with other users within a single site.

While in site trunking mode, the display shows "Site Trunking", and the radio sounds a repeating double beep. The double beep continues until normal service is restored.

When access to the zone controller is available again, the radio automatically returns to normal multi-site operation.

P25 phase 1 features supported on P25 phase 2

If the user tries to use a P25 phase 1 feature which is not yet supported in P25 phase 2, the radio may show a system error.

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P25 phase 2 fallback mode

If there is a fault on the phase 2 network, operation may fall back to phase 1 mode.

Failsoft mode

The radio may be programmed to enter 'failsoft' mode when service is lost due to failure of a trunking site controller. For information, see Failsoft Mode on page 75.

8.2 Making an Individual Call

To make a call to a single radio:

1. Press **Menu** and select **Individual call**.
2. Scroll to the desired contact, then press the **PTT key**.
3. The message **Calling...** briefly appears.
4. When the called party accepts the call, you will hear three short beeps.
5. Once the called party has finished talking, press and hold the **PTT key** to transmit. Speak clearly into the microphone. Release the **PTT key** when you have finished talking.

8.3 Receiving an Individual Call

When you receive a call from an individual radio, the radio displays the caller's name or identity.

The radio rings until the call is answered.

Press the **PTT** key to accept the call, or **Cancel** to reject the call.

8.4 Making a Talkgroup Call

A talkgroup is a collection of radios on a trunking system. Trunked talkgroups are found in the Channels menu, along with conventional channels that may also be available for the currently selected zone.

Depending on how the radio is programmed, the user may be able to press a function key, use the Quick Access menu or use the channel selector to select a trunked talkgroup.

> Ensure that the rear microphone is not covered by your hand or clothing when making a call.

To make a talkgroup call on a trunking system:

1. Select the required zone:

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- press **Menu** and select **Zones**.
- scroll to the required zone, and press **Select**.

> Depending on how the radio is programmed, the user may be able to press a function key, use the Quick Access menu or use the 3-way selector to select a zone.

The radio can be configured to indicate the zone in which it is operating, either as a letter in the top right corner of the display, as a zone name in the second line of the display, or neither.

2. Select the required talkgroup:
   - Press **Menu** and select **Channels**.
   - Scroll to the required talkgroup, and press **Select**.
3. Press and hold the **PTT key** to transmit.
4. When you hear three short beeps, speak clearly into the microphone.
5. Release the **PTT key** key when you have finished talking.

In some situations, the call will not proceed. For an explanation of the radio behavior, see Unconnected Calls on the next page.

8.5 Receiving a Talkgroup Call

To hear calls from other members of a talkgroup, the radio must have that talkgroup selected, or the talkgroup must be part of an active scanning group.

For information about selecting a talkgroup, see Making a Talkgroup Call on the previous page, and for information about talkgroup scanning, see Activating Talkgroup Scanning on page 86.

When you receive a call from a talkgroup, the radio displays the name or the identity of the talkgroup, and that of the calling radio.

8.6 Making a Phone Call

You may be able to use the radio to connect to a telephone network and make a phone call.

To make a phone call on a trunking system

1. Press **Menu** and select **Phone call**.

   The phone call you last dialed appears in the display, unless that number was manually dialed.
2. Scroll to the number or person you want to call, or dial the required number using the alphanumeric keys.

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3. Press **Select** or the **PTT key**.
   Call progress will be indicated by “ring” or “busy” tones as for a standard telephone call.
4. When the call is answered, proceed with your conversation.
5. At the completion of the call, or if the dialed number is busy or does not answer, press the **End** key.

8.7 Checking Recent Calls

This feature is only available for digital P25 channels and applies to individual calls and call alert pages, see Making an Individual Call on page 72 and Call Alert on page 77.

Your radio may be able to store a list of the last 20 calls. These calls may be calls that you have received, calls that you have made, or calls that you have missed.

To use your recent calls list to make a call:

1. Press **Menu** and select **Recent calls**.

   The most recent call is displayed at the top of the list. If you have not participated in any calls since your radio was switched on, the message "No items in list" appears on the display.
2. Use the scroll keys to scroll through the list of recent calls until the desired call appears, then press **Call**.

8.8 Dynamic Regrouping

Dynamic regrouping allows the user to send a dynamic regrouping request to the dispatcher. The dispatcher can then reassign the user's radio to a special communications group.

To send a dynamic regrouping request

Press **Menu**, then select **Trunking > Dyn Regrouping**.

The Message "Sending dynamic regroup rqst" appears on the display.

If the request is successful, an acknowledgment message is displayed.

> While are operating on this group, normal channel selection may be disabled.

8.9 Unconnected Calls

If your call is not connected, the way your radio behaves is explained in Table 8.1 on the next page.

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Table 8.1 Unconnected call behavior

Radio message and behavior	Explanation
"System Queued" is displayed.	The system is too busy to process your talkgroup or individual call.
"Busy channel now free" is displayed The radio sounds three short beeps.	The system is now available to process your talkgroup or individual call.
"[Talkgroup Name] No Service" is displayed. The radio sounds five beeps, followed by a repeating double beep.	You have selected a talkgroup that does not currently exist on the system. Your display shows that you have lost service and no longer appears. See Checking Network Availability on page 52.
"No answer" is displayed. The radio sounds two short beeps.	You have attempted to make an individual call to a radio that does not currently exist on the system. You have attempted to make an individual or phone call, but you are not authorized to do this.
"No answer" is displayed. The radio sounds two short beeps.	Your individual or phone call has been rejected or is unanswered.

8.10 Failsoft Mode

If the radio is unable to access the trunking system, it may be programmed to enter failsoft mode.

Failsoft mode operates in one of two ways:

- radio-based failsoft
- infrastructure failsoft

8.10.1 Radio-based failsoft

When access to the trunking system is lost, no longer appears, the RSSI bars, , disappear and the display shows "No service".

After a short time, the radio switches to a preprogrammed conventional communications channel.

The radio remains on that channel until you select a trunked talkgroup with access to the trunking system.

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8.10.2 Infrastructure failsoft

The radio receives a message from the trunking infrastructure indicating that the trunking system is now operating in failsoft mode.

While in failsoft mode, the display shows "Failsoft", and the radio sounds a repeating double beep. The double beep continues until normal service is restored.

You may still be able to communicate with your dispatcher and other talkgroup members, depending on the type of system failure that has occurred, and how the radio is programmed.

When the trunking system returns to normal operation, the radio is notified, and will attempt to register on the control channel it was previously using.

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9 P25 Services

This section describes the P25-specific services that may be available on your radio.

> Some features in this section are controlled by software licenses (SFE) and may not be available with your radio.

9.1 Call Alert

You can let another radio user know that you want to talk to them by sending them a call alert page. When the other radio user receives the call alert page, they can call you back when it is convenient.

If you are on a P25 trunk channel, you can send a call alert to any other radio on a trunk channel on the same network.

If you are on a P25 conventional channel, you can send a call alert to any other radio on the same conventional channel.

To send a call alert page:

1. Press **Menu** and select **Services > Call alert**.
2. Use the scroll keys to select the radio you want to page.
3. Press **Send to**.

   The message "Sending page to .." appears on the display

The LED glows red and a message may be displayed to advise you whether the call alert has been sent successfully or not.

If an acknowledgment is not received from the recipient's radio, you will have the option of either canceling or resending the request.

Answering a call alert page

If you receive a call alert page from another radio user, the message "Page rx'd from... " briefly appears on the display.

Select **Call** to return the page or **No** to delete it.

If you miss the call alert page, the identity of the caller may be saved in your recent calls list. See Checking Recent Calls on page 74.

9.2 Messages

You may be able to send short messages to another radio user. These messages are defined at programming time.

If you are on a P25 trunked channel, you can send a message to any other radio on a trunk channel on the same network.

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If you are on a P25 conventional channel, you can send a message to any other radio on the same conventional channel.

The radio to whom you are sending the message must have the same message programmed in order to read and display your message.

9.3 Radio Unit Monitor

> This feature is controlled by a software license (SFE) and may not be available with your radio. This software license is only required for the radio that sends the radio unit monitor request. The receiving radio does not need this software license.

The radio unit monitor feature can be used when you are concerned about the safety of a radio user on your system. When you send a radio-unit monitor request to a radio, it calls you back without giving any indication that it is making a call. You can hear any activity near the radio for up to 20 seconds.

This feature is only available for digital channels operating in conventional mode, and for radios configured for dispatcher operation.

9.3.1 Sending a radio unit monitor request

1. Press **Menu** and select **Services > Radio monitor**.
2. Scroll to the radio you want to monitor.
3. Press **Send to**.

   The message "Sending R.U.M to.." appears on the display.
4. If the other radio has received your request, it will now call you, so that you can monitor activity near the radio.

   The message " Call received.." appears on the display.

If an acknowledgment is not received from the recipient’s radio, you will have the option of either canceling or resending the request.

9.3.2 Sending a message

You may be able to send your message to a predetermined person or to the dispatcher administering the current talkgroup, or to a person of your choice.

Sending a message to a predetermined person or talkgroup administrator

1. Press **Menu** and select **Services > Messages**.
2. Use the scroll keys to select the message you want from the list.
3. Press **Select**.

   A message showing the destination briefly appears on the display.

The red LED glows and a message may be displayed to advise you whether the message has been sent successfully or not.

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If an acknowledgment is not received from the recipient's radio, you will have the option of either canceling or resending the call alert page.

Sending a message to a person of your choice

1. Press **Menu** and select **Services > Messages**.

   Depending on how your radio is programmed, you may be able to press a function key or use your Quick Access menu to select messages.
2. Use the scroll keys to select the message you want from the message list.
3. Press **Select**.
4. Select the message recipient from the list and press **Send**.

   A message showing the destination briefly appears on the display.

   The LED glows red and a message may be displayed to advise you whether the message has been sent successfully or not.

If an acknowledgement is not received from the recipient's radio, you will have the option of either canceling or resending the request.

9.4 Status Request

This feature is only available on P25 conventional channels.

You can find out what another radio user is currently doing by asking their radio to send you a status update.

To send a status request:

1. Press **Menu** and select **Services > Status request**.
2. Use the scroll keys to select the status request recipient from the list.
3. Press **Send to**.

   A message showing the destination briefly appears on the display

   The LED glows red briefly. If the request was successful, a message showing the status briefly appears on the display.

If an acknowledgment is not received from the recipient's radio, you will have the option of either canceling or resending the request.

9.5 Status Update

You can inform another radio user of your current status by sending them a status update, for example, 'At scene'. You may be able to send the status update to a predetermined person or talkgroup, or to a person of your choice.

If you are on a P25 trunked channel, you can send your status to any other radio on a trunk channel on the same network.

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If you are on a P25 conventional channel, you can send your status to any other radio on the same conventional channel.

When you send a status message, you are also setting your status, which the dispatcher may be able to check by 'interrogating' your radio. You can change your status at any time by selecting another status message and sending it. See Status Request on the previous page.

To send a status update:

1. Press **Menu** and select **Services > Status update**.

   Depending on how your radio is programmed, you may be able to press a function key or use your Quick Access menu to select status update.

2. Select the status message you want from the list.

3. Press **Send** or **Select**.

   A message showing the destination briefly appears on the display.

The LED glows red and a message may be displayed to advise you whether the status update has been sent successfully or not.

If an acknowledgment is not received from the recipient's radio, you will have the option of either canceling or resending the request.

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10 Location Services

This section explains how to use the location services that may be available on your radio.

> This feature is controlled by a software license (SFE) and may not be available with your radio.

10.1 Location Information

While you may be able to view your location information on analog channels, sending location information is only available for digital channels.

If your radio is connected to the receiver of a satellite navigation system, you can view location information such as latitude and longitude, true course, speed, and coordinated universal time.

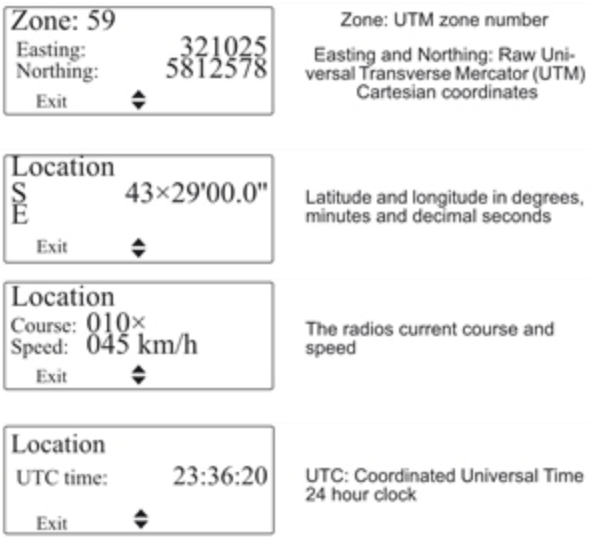
Your radio can also display Universal Transverse Mercator (UTM) information such as the UTM zone, and northing and easting coordinates.

Your radio may also be set up to send and log location information.

10.2 Viewing Location Information

To view

1. Press **Menu** and select **Location Svs > Own location**.
2. Use the scroll keys to scroll though the **Own location** displays:



3. Press **Exit** to exit the location display.

In certain situations, your radio may automatically exit the location display.

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10.3 Location Statuses

In the **Own location** screen, location status information appears at the top right of the display.

Status information shown on a hand-held control head is shown in brackets [ ]:

- tracking [Trk]: the receiver is displaying up-to-date satellite information.
- stored: the receiver is having trouble connecting to satellites and the radio is displaying stored information that may not be current.
- lost cnx [no cnx]: the radio has lost serial communications with the receiver.

10.4 Sending Location Information

The radio may be programmed to send it's location information when certain actions are performed. To send location information, you can:

- press the PTT key.
- use a function key.
- send using the radio menu.

10.4.1 Using the PTT key

Your radio may be configured to send location information each time you press or release the PTT key. This feature can be turned on or off using the Send On PTT menu, and may be active when the radio is first turned on.

To turn Send on PTT off or on:

1. Press **Menu** and select **Location Svs > Send on PTT**.
2. Scroll to **On** or **Off** and press **Select**.

10.4.2 Using a function key

You may be able to use a function key to manually send your location to either all radios on the channel, or to your dispatcher (depending on how your radio is programmed).

1. Press **Menu** and select **Location Svs > Own location**.

   The current location of the radio appears on the display.
2. Press **Send**.
3. The message "Location sent" briefly appears on the display.

10.5 Receiving and Logging Location Information

When your radio receives location information, the display shows **Location**, along with the digital alias of the sending radio—e.g. 'Car 1'. If the radio alias is not available, the radio ID appears.

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The location information can then be viewed and logged. The most recent location details of up to 10 radios will be available, until the radio is turned off.

Updated information from a previously logged radio is automatically stored by your radio, without first being viewed.

To display and log the received location of a radio:

1. Press **View**.

   The location information appears on the display

2. Press **Add** to add the radio to your Team Locations.

   The message "Terminal added" briefly appears on the display.

To add a radio to your Team locations:

1. Press **Menu** then select, **Location Svs > Team Locations**.
2. Select **Options**, then select **Add**.
3. Select a radio from the **Recent talkers** list, or by entering a **Dialed number**.

10.6 Accessing Logged Location Information

10.6.1 Accessing team locations

You can use the **Team Locations** menu option to display the latest location information received by added devices. To view a radio's logged location information:

1. Press **Menu** and select **Location Svs > Team Locations**.
2. Scroll to the radio you want and press **Options**.
3. Select **View**.

   The latest location information available for that radio appears.

4. Use the up and down scroll keys to view the location display options that have been configured.

> Select **Delete** from the Options menu to remove the location information for the radio, and stop logging it.

10.6.2 Accessing recent locations

The latest location data received, including Team Locations, can be viewed using the Recent Contacts menu option. Up to 10 entries will be available.

To view the Recent Contacts information:

1. Press **Menu** and select **Location Svs > Recent Contacts**.
2. Scroll down to the contact you want and press **View**.

   The latest location information available for that radio appears.

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3. Use the up and down scroll keys to view the location display options that have been configured.

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11 Scanning

This section explains the different types of scanning that may be available on your radio, and also how to view and edit scan group members.

11.1 About Scanning

The scan feature is used to monitor groups of channels or talkgroups for activity of interest. This means that you are able to operate across multiple channels or talkgroups at the same time. For example, you may need to monitor your own conventional dispatch channel as well as other local area channels, such as a local sheriff and highway patrol channel.

When scanning is active, the radio searches through member channels for activity. If activity is found, the radio remains on that channel or talkgroup, so that you can hear the activity, and respond if necessary. Once the activity has finished, the radio begins searching again.

Some channels or talkgroups, known as priority channels or talkgroups, are scanned more often that others in the scan group. Calls from priority channels or talkgroups take precedence over those from non-priority group members.

While the radio is scanning for activity, the orange LED glows and the animated scanning icon appears on the display.

When the radio stops on a channel or talkgroup where there is activity, the orange LED and the icon flashes.

In a background or talkgroup scan group, a scanning icon with a tick indicates that the selected channel or talkgroup is a member of the scan group.

The four types of scanning that may be available on your radio are:

- standard scanning
- background scanning
- in-zone scanning
- talkgroup scanning

11.2 Activating Standard Scanning

A standard scan group scans conventional channels from across zones, and can also scan one or two voting groups. A standard scan group appears and behaves on the radio like a separate channel, and all standard scan groups are included in the channel list.

Standard scanning is activated when you select a standard scan group.

To select a standard scan group:

1. Press **Menu** and select **Channels**.
2. Scroll to the group you want and press **Select**.

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11.3 Activating Background Scanning

A background scan group scans the group members, as well as the current channel selected on the radio. The group member channels can include conventional channels across zones, and can also include one or two voting groups.

Background scanning provides more flexibility than standard scanning, as the radio user can select a current channel to operate on, while still monitoring permanent group members for activity.

To turn background scanning on:

- Press **Menu** and select **Radio settings > Functions > Scanning**

  Background scanning remains on until you select a standard, in-zone or talkgroup scan group.

11.3.1 Changing the background scan group assigned to the function key

1. Press **Menu** and select **Radio settings > Functions > Set scan key**.
2. Scroll through the list of background scan groups available and press **Select**. When you next turn on background scanning, this is the scan group that is activated.

11.4 Activating In-Zone Scanning

An in-zone scan group scans the first 50 conventional channels or trunked talkgroups from the currently-selected zone. If you change zones, the radio stops scanning the previous zone's channels and automatically starts scanning channels from the new zone.

In-zone scanning is useful when scanning conventional channels and trunked talkgroups from within the selected zone. As you change to a new region or role, you can change to another zone and the radio will automatically start scanning channels or talkgroups in the new zone, with no further action required.

To turn in-zone scanning on:

- Press **Menu** and select **Radio settings > Functions > Scanning**

  In-zone scanning remains on until you select a standard, background or talkgroup scan group.

11.5 Activating Talkgroup Scanning

Talkgroup scanning monitors calls from multiple trunked talkgroups, and up to five additional conventional channels from across zones.

If conventional channels are included as group members, your radio will briefly leave the trunking control channel to scan these channels at regular intervals.

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> If a **talkgroup scan group** contains P25 or analog conventional channels, scanning needs to exit trunk mode briefly to scan the conventional channels. **This may result in delayed or missed calls**.

Talkgroup scanning is useful if you need to operate across multiple trunked talkgroups. When talkgroup scanning is activated, the currently-selected talkgroup or channel is temporarily included in the scan group.

If you change zones, the radio continues to monitor group members as well as the currently selected talkgroup or channel from the new zone.

To turn talkgroup scanning on:

- Press **Menu** and select **Radio settings > Functions > Scanning**

  Talkgroup scanning remains on until you select a standard, background or in-zone scan group.

11.6 Making a Call While Scanning

If you want to make a call while your radio is scanning:

1. Press the **PTT key** to transmit.

   If the icon and the orange LED are flashing, the radio calls the currently selected channel.

   If there has been no recent activity on the channel—the icon and the orange LED are not flashing—then the channel that is called depends on the way your radio has been programmed.

   The possible options are:

   - your radio calls a predetermined channel, e.g. your dispatcher
   - your radio calls the channel where activity was last detected
   - your radio calls the last free channel

11.6.1 Selecting a scanning or voting group

A scan or voting group is a collection of channels that are grouped together for either scanning or voting. In the **Channels** menu, the scan or voting group is shown as being a single channel item, e.g. 'Scan1'.

Using the main menu

1. Press **Menu** and select **Channels**.
2. Scroll through the list of channels and groups until the desired group appears.
3. Press **Select**.

   The programmed scan or voting group is now shown on the display.

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The scanning icon appears on the display.

> Depending on how the radio is programmed, a function key, the scroll keys or left selection key may be used to select a group.

Dialing a scan or voting group

Dialing a scan or voting group may be available from the radio's idle display and is always available while in the Channels menu.

This feature is only available for radios with alphanumeric keys.

To dial the group number from the default display:

1. Dial the number associated with the scan or voting group using the alphanumeric keys.
2. Press **Select**.

   The programmed scan or voting group is now shown on the display.

   The scanning icon appears on the display.

11.7 Suspending a Channel from a Scan Group

If a group member is busy for a long time and you do not want to hear the conversation, you may be able to use the function key programmed for nuisance delete to temporarily delete the group member. When the scan group is next selected, or after the radio has been turned off and then on, the deleted member is again part of the scan group.

To temporarily remove a captured group member from the scan group:

Press the **function key** programmed for nuisance delete.

If the channel has been removed successfully, the message "Channel nuisance deleted" appears on the display.

> The function key programmed to activate scanning may be programmed so that a short key press activates scanning and a long key press activates nuisance delete.

Table 11.1 below lists the messages that may appear when using nuisance delete to temporarily remove a channel from a group, adding or deleting channels, or adjusting transmit or priority channels within a group.

Table 11.1 Nuisance delete icons and descriptions

Message	Description
Scanning not on	Users cannot use nuisance delete to temporarily delete a channel from a group, as there is no group currently selected
No channel captured	Users cannot use nuisance delete to temporarily delete a channel from the group, as there is no channel currently captured

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Message	Description
Not enough channels in group	Users cannot use nuisance delete to temporarily delete the channel from the group, as the captured channel is the last remaining group member
Cannot delete channel	Users cannot use nuisance delete to temporarily delete the channel from the group. The captured channel may be the selected channel in a background scanning group
Cannot delete priority chan	Users cannot use nuisance delete to temporarily delete the channel from the group, as the captured channel is a priority channel
Only two channels in group	Users cannot delete a channel from the group, as there would be only one group member left
No items in list	Users cannot perform the action due to: • the group not having preset transmit channel or priority channels programmed • the user having added all the channels in the zone to the current group
Group full	Users cannot add any more channels to the group, as the maximum number of members (50) has been reached

11.8 Editing a Scan Group

11.8.1 Selecting a group to edit

1. Press **Menu** and select **Radio settings > Functions > Advanced > Edit groups**.

   The **Edit Groups** menu lists all scan groups programmed for your radio.

2. Scroll to the group that you want to view or edit, press **Select**.

3. In the Edit Group menu, select from the following options:
   - **Group members**: shows the current members of a group, and may also show the designated transmit channel and priority channels
   - **Add** or **Delete channel**: adds or deletes member channels of a group
   - **Change tx**: changes the group's transmit channel
   - **Change P1** or **P2**: changes the group's first or second priority channel

11.8.2 Viewing group membership

1. In the **Radio settings** menu, select **Edit groups** and select a scan group. Press **Select**.
2. In the **Edit Group** menu, select **Group members** and press **Select**.
3. Scroll through the list of group members. The names of the group members may be shortened.

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11.8.3 Adding a channel to a group

1. In the **Radio settings** menu, select **Edit groups** and select a scan group. Press **Select**.
2. In the **Edit Group** menu, select **Add channel** and press **Select**.

   A list of channels that are not group members appears.
3. Select the channel you want to add and press **OK**.

11.8.4 Deleting a channel from a group

You cannot delete the priority 1 channel using the Delete Channel menu.

1. In the **Radio settings** menu, select **Edit groups** and select a scan group. Press **Select**.
2. In the **Edit Group** menu, select **Delete channel**, then press **Select**.

   A list of group members that are able to be deleted appears.
3. Select the channel you want to delete and press **OK**.

11.8.5 Changing a group's transmit channel

1. In the **Radio settings** menu, select **Edit groups** and select a scan group. Press **Select**.
2. In the **Edit Group** menu, select **Change tx** and press **Select**.

   The current transmit channel is identified by the Tx icon beside the channel name.
3. Select the new transmit channel and press **OK**.

> You can change the group’s transmit channel only if it has been pre-programmed.

> The transmit channel remains changed even after the radio is turned off.

11.8.6 Changing a group's first or second priority channel

1. In the **Radio settings** menu, select **Edit groups** and select a scan group. Press **Select**.
2. In the **Edit Group** menu, select **Change P1** or **Change P2** and press **Select**.

   The current priority channels are identified by the P_1 or P_2 icons beside the channel names.
3. Select the new priority 1 or priority 2 channel and press **OK**.

For more information on the icons shown when working with groups, see Group indicators below.

11.8.7 Group indicators

The icons in Table 11.2 on the next page may appear when viewing group membership details, adding or deleting channels from a group, or changing a group’s transmit or priority channels.

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Table 11.2 Group membership icons

Icon	Description
T_X	This channel is used to transmit on when there has been no recent activity. You cannot delete this channel (it will not appear under **Delete channel**).
P_1	This channel is the group's first priority channel. You cannot delete this channel (it will not appear under **Delete channel**).
P_2	This channel is the group's second priority channel. You cannot delete this channel (it will not appear under **Delete channel**).
+	There is more than one instance of this channel in the group (the channel will be scanned more often). If you delete this channel, the radio will attempt to delete all instances of the channel.

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12 Encryption

To ensure private communication, the radio can encrypt outgoing calls using a confidential encryption key. The receiving radio must have the same encryption key installed to hear the encrypted call.

The encryption feature is available only for Digital and Dual Mode networks.

On conventional networks, a voice-inversion scrambler is used for encryption purposes.

> This feature is controlled by a software license (SFE) and may not be available with the radio.

12.1 Making an Encrypted Call

To make an encrypted call:

1. Select the desired network, channel, or group to operate on.
2. Check that encryption is on — is visible on the display.
3. Press and hold the **PTT key** to transmit.

   The name of the encryption key used for the transmission may briefly appear on the display.

If users transmit or receive an unencrypted call on an encrypted network, disappears and the radio may issue an audible alert tone.

12.2 Receiving an Encrypted Call

When receiving an encrypted call, the radio unmutes and speech can be heard, so long as the key required to decode the call is stored in the radio.

The name of the encryption key used to receive the incoming call may briefly appear on the display, and appears on the display.

If the key required to decode the call is not stored in the radio, the radio remains muted and the message "Key fail" appears.

The radio may also remain muted if the currently selected channel has 'proper key detect' programmed. See Proper Key Detect below.

12.3 Proper Key Detect

The radio may be programmed with ‘proper key detect’. This means that you can only hear an encrypted call if the key used to encrypt the incoming call matches the key used to encrypt your outgoing calls on that channel.

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For example, you are encrypting your outgoing calls using encryption key 7. Although key 1 and key 2 are also stored in the radio, the radio has been programmed so that it will only unmute for incoming calls encrypted using key 7.

Encryption does not need to be enabled for the radio to unmute.

12.4 Changing the Radio's Encryption Keys

> Once the encryption key is changed, it may also automatically update the encryption keys used to encrypt calls on other channels.

12.4.1 Changing the transmit encryption key

Press Menu and select Security > Change all.

2. Scroll to the required key and press Select. The message Global key selected briefly appears in

the display.

12.4.2 Return the transmit encryption key to the default setting

1. Press **Menu** and select **Security > Preset keys**.

   The message "Select preset keys?" appears on the display.
2. Select **OK**.

   The message Preset keys selected briefly appears on the display.

12.4.3 Changing the keyset

The radio may contain multiple sets of encryption keys.

To change the keyset:

1. Select **Menu > Security > Security > Change keyset**.
2. Scroll to 01 or 02 and press **Select**.

   The message "Keyset selected" briefly appears on the display.

12.5 Removing Encryption Keys from the Radio

It may be possible to delete encryption keys from the radio.

> When emergency mode is activated, or when the radio is immobilized or 'inhibited', encryption keys may be automatically deleted from the radio.

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12.5.1 Removing an encryption key

1. Press **Menu** and select **Security > Advanced > Zeroize key**.
2. Scroll to the desired key and press **Select**.

   The message "Single key zeroized" briefly appears on the display.

12.5.2 Removing all encryption keys

1. Press **Menu** and select **Security > Advanced > Zeroize all**.

   The message "Zeroize all keys?" appears on the display.
2. Select **OK**.

   The message "All keys zeroized" briefly appears on the display.

If the encryption keys are removed, the message "Key fail" appears and a warning tone will sound periodically.

The message "Cannot transmit" will be displayed if the user attempts to transmit.

12.6 Updating Encryption Keys Over-The-Air

Encryption keys may be updated using Over-The-Air-Rekeying (OTAR).

1. Press **Menu** and select **Security > OTAR > Rekey request**.
2. The message "Rekey request ack" appears on the display.

   If there is no response to the rekey request, the message "Rekey request timeout" appears.

> This feature is only available for digital channels.

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13 Customizing Radio Settings

13.1 Changing the Color Mode

1. Press **Menu** and select **Radio settings > Display settings > Color mode**.
2. Scroll to the desired mode and press **Select**.

The radio's display will change to the selected mode.

Table 13.1 Color modes and descriptions

Mode	Description
Color - Light	Default setting. Light background, dark text. Best suited for day time display.
Color - Dark	Dark background, light text
Black/White	White background, black text
White/Black	Black background, white text
Red/Black	Black background, red text. Best suited for night display.

13.2 Changing the External Alert Option

If you are away from your radio and unable to answer calls immediately, an external alert, such as a car horn, may activate when you receive a call. The external alert continues for a period of time, then turns off.

To turn external alert on or off:

1. Press **Menu** and select **Radio settings >Alert settings > External alert**.
2. Scroll to either On or Off and press **Select**.

13.3 Changing to Silent Operation

1. Press **Menu** and select **Radio settings > Alert settings > Silent operation**.
2. Use the scroll keys to either On or Off and press **Select**.

When silent operation is on, appears on the display. All the radio’s audible tones are turned off—only channel traffic can be heard.

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13.4 Changing to Quiet Operation

1. Press **Menu** and select **Radio settings > Alert settings > Quiet operation**.
2. Scroll to On or Off and press **Select**.

When quiet operation is on, keypress tones and confirmation tones are turned off. Incoming call tones, signaling tones, and warning tones remain audible.

13.5 Changing the Volume of all Audible Indicators

1. Press **Menu** and select **Radio settings > Alert settings > Indicator level**.
2. Scroll to High or Low and press **Select**.

Audible tones include incoming call tones, warning tones, and confirmation tones.

13.6 Changing the Volume of Keypress Tones

1. Press **Menu** and select **Radio settings> Alert settings > Keypress tones**.
2. Scroll to either Off, Low, or High and press **Select**.

13.7 Date and Time Settings

Setting the date, time, and time format

1. Press **Menu** and select **Time and Date** and the corresponding option.
2. Follow the prompts on the display to set the time and date.

Your radio may be programmed to allow you to set time and date manually, or update automatically using a GPS source.

13.7.1 Viewing the time and date

Press **Menu** and select **Time and Date > View clock**.

Depending on how the radio is programmed, you may be able to press a function key to view the time and date.

13.8 Transmitting at Low Power

1. Press **Menu** and select **Radio settings > Functions > Low power tx**.
2. Scroll to On or Off and press **Select**.

The message "Low power tx activated" or "deactivated" appears briefly on the display.

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When low power transmit is turned on, the low-power transmit icon appears on the display and calls are made at low power rather than the programmed power setting.

13.9 Turning on Backlighting

1. Press **Menu** and select **Radio settings > Display settings > Backlighting**.
2. Scroll to either On or Off and press **Select**.

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14 Troubleshooting

This section describes troubleshooting procedures. Consult your radio provider for assistance, if necessary.

14.1 The Radio Won't Turn On

If the radio LED does not briefly light up when the radio is turned on, power is likely not reaching the radio.

Check the following:

- is the power connector firmly plugged into the rear of the radio?
- are the in-line fuses in good condition?
- is the power cable securely connected to the vehicle battery or power supply?

If all appears to be in order, but your radio still fails to operate properly, contact your radio provider for further assistance.

14.2 Identifying the Radio's Audible Tones

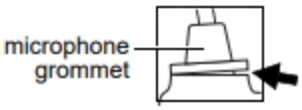
The radio's audible tones can help identify potential problems. See Audible tones on page 23.

14.3 Removing the Microphone

Remove the grommet carefully as it serves two important functions.

It prevents damage to the microphone socket due to movement of the microphone cord, and ensures that the control head is sealed against water, dust, and other environmental hazards.

To remove the microphone:



1. Using your thumb or forefinger, lift up one of the corners of the microphone grommet and firmly (but gently) pull that corner until the seal comes away from the cavity.
2. Repeat to expose another corner.
3. Pull the exposed corners back and slide the grommet up the cable to reveal the microphone plug.
4. Remove the plug from the microphone socket.

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14.4 Viewing Radio Information

14.4.1 Using the menu

1. Press **Menu** and select **Radio settings > Radio info**.
2. Scroll to the radio information you want to view and press **Select**.

The Radio info menu to displays information hardware and firmware version of your radio, function key settings, the radio serial number, and various radio identities.

14.4.2 Using the PTT key

1. Turn off the radio.
2. Hold down the **PTT key**, then turn on the radio.

   The firmware and hardware versions, and your radio's frequency band are briefly displayed.

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15 General Care

Your radio requires no regular maintenance other than ensuring that all the cables and connections are secure, and that no damage has occurred to the antenna or wiring.

To prevent permanent damage to the radio case, do not allow the radio to come into contact with detergents, alcohol, aerosol sprays, or petroleum-based products.

15.1 Cleaning the Radio

15.1.1 Cleaning safety precautions

Risk of permanent damage to the radio housing! Do not clean the radio with solvents or alcohol based products. This includes (but is not limited to) ethylene glycol (antifreeze), propanone (acetone), ethanol (methylated spirits), isopropyl alcohol, and pool chlorine (calcium hypochlorite).

Risk of internal damage! To avoid damaging the inside of the radio, do not allow excess liquid to enter the radio body (speaker grille, keypad, buttons, and connectors).

Health risk! Always use protective equipment (gloves, face mask) when handling bleach.

15.1.2 Cleaning the radio

1. Use a lint-free, dry cloth to remove surface dirt, oil, or grease.
2. Use an alcohol-free, antibacterial wipe to disinfect the radio.
3. Use a water-dampened, lint-free, microfibre cloth to remove any remaining dirt.
4. If the damp cloth is ineffective, dilute a (5 to 10%) solution of alcohol-free dishwashing liquid in clean water, on a cloth, to remove remaining dirt.
5. If the dishwashing liquid solution is ineffective, use a solution of one part household bleach to two parts clean water, on a cloth, to wipe away remaining dirt.

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