

**TM9100** mobiles

# User's Guide



[www.taitworld.com](http://www.taitworld.com)



# To our European customers



Tait Electronics Limited is an environmentally responsible company which supports waste minimization and material recovery. The European Union's Waste Electrical and Electronic Equipment Directive requires that this product be disposed of separately from the general waste stream when its service life is over. Please be environmentally responsible and dispose through the original supplier, your local municipal waste "separate collection" service, or contact Tait Electronics Limited.

# For your safety

Before using your radio, please read the following important safety and compliance information.

## Radio frequency exposure information

For your own safety and to ensure you comply with the Federal Communication Commission's (FCC) radio frequency (RF) exposure guidelines, please read the following information before using this radio.

### Using this radio

You should use this radio only for work-related purposes (it is not authorized for any other use) and if you are fully aware of, and can exercise control over, your exposure to RF energy. To prevent exceeding FCC RF exposure limits, you must control the amount and duration of RF that you and other people are exposed to.

It is also important that you:

- Do not remove the RF Exposure label from the radio.
- Ensure this RF exposure information accompanies the radio when it is transferred to other users.
- Do not use the radio if you do not adhere to the guidelines on controlling your exposure to RF.

### Controlling your exposure to RF energy

This radio emits radio frequency (RF) energy or radio waves primarily when calls are made. RF is a form of electromagnetic energy (as is sunlight), and there are recommended levels of maximum RF exposure.

To control your exposure to RF and comply with the maximum exposure limits for occupational/controlled environments, follow these guidelines:

- Do not talk (transmit) on the radio more than the rated transmit duty cycle. This is important because

the radio radiates more energy when it is transmitting than when it is receiving.

- While you are transmitting (talking or sending data) on the radio, you must ensure that there is always a distance of 0.9m (35 inches) between people and the antenna. This is the minimum safe distance.
- Use the radio only with Tait-approved antennas and attachments, and make only authorized modifications to the antenna otherwise you could damage the radio and violate FCC regulations.

For more information on what RF energy is and how to control your exposure to it, visit the FCC website at <http://www.fcc.gov/oet/rfsafety/rf-faqs.html>.

### **Compliance with RF energy exposure standards**

This two-way radio complies with these RF energy exposure standards and guidelines:

- United States Federal Communications Commission, Code of Federal Regulations; 47 CFR §§ 1.1307, 1.1310, and 2.1091.
- American National Standards Institute (ANSI) / Institute of Electrical and Electronic Engineers (IEEE) C95.1-1992
- Institute of Electrical and Electronic Engineers (IEEE) C95.1-1999 Edition.

This radio complies with the IEEE and ICNIRP exposure limits for occupational/controlled RF exposure environments at operating duty factors of up to 50 % talk to 50 % listen.

## **Radio frequency emissions limits in the USA**

Part 15 of the FCC Rules imposes RF emission limits on receivers.

This radio complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

## Unapproved modifications or changes to radio

The radio is designed to satisfy the applicable compliance regulations. Do not make modifications or changes to the radio that are not expressly approved by Tait Electronics Ltd. Failure to do so could invalidate compliance requirements and void the user's authority to operate the radio.

## Frequency band reserved for distress beacons

Frequency band 406 to 406.1 MHz is reserved for use by distress beacons. Transmissions should not be made within this frequency band.

## Safe radio operation



**Warning:** Switch off the radio:

- at petrol filling stations or near flammable liquids or gases
- in the vicinity of explosive devices and blasting zones

Using a handheld microphone or a radio while driving a vehicle may violate the laws and legislation that apply in your country or state. Please check the vehicle regulations in your area.

## Interference with electronic devices

Some electronic devices may be prone to malfunction due to the lack of protection from RF energy that is present when your radio is transmitting.

Examples of electronic devices that may be affected by RF energy are:

- vehicular electronic systems such as fuel injection, anti-skid brakes, and cruise control
- medical devices such as hearing aids and pacemakers
- medical equipment in hospitals or health care facilities.

Consult the manufacturer (or its representative) of the equipment to determine whether these electronic circuits will perform normally when the radio is transmitting.

## High temperatures

The bottom surface of the radio and the heatsink fins can become hot during prolonged operation. Do not touch these parts of the radio.

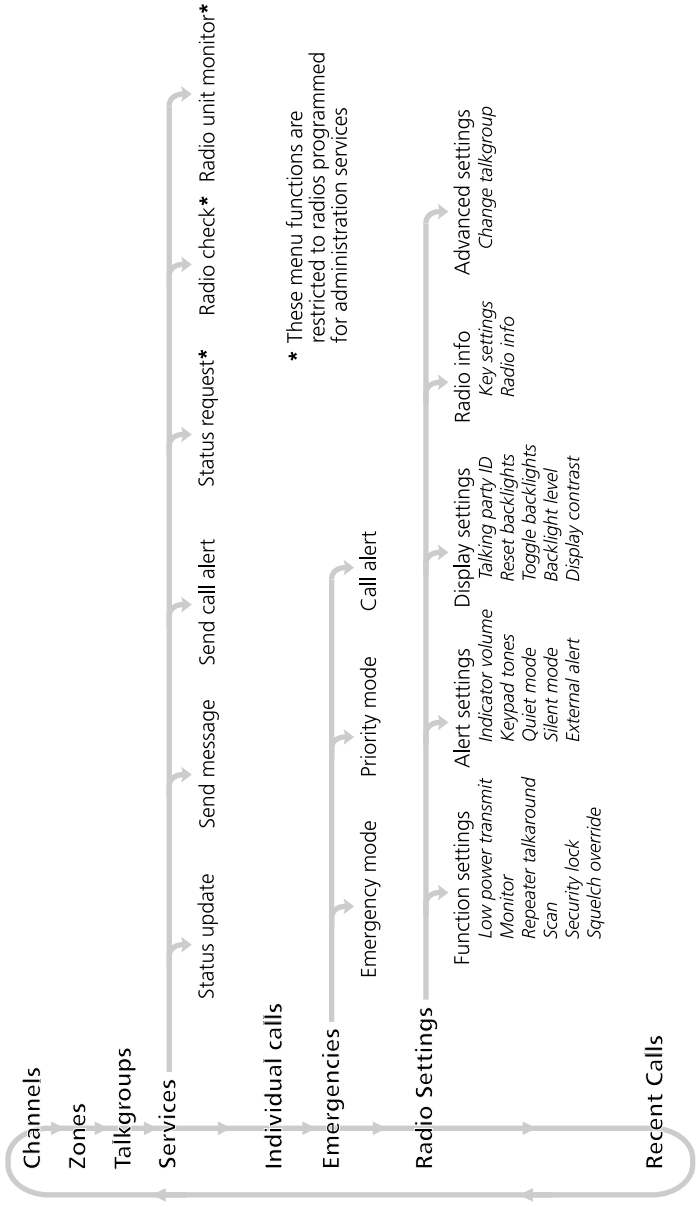
## Radio protection

Always remove the fuses from the radio power cable before charging the vehicle battery, connecting a second battery or using power from another vehicle (e.g. when “jump-starting” the vehicle).





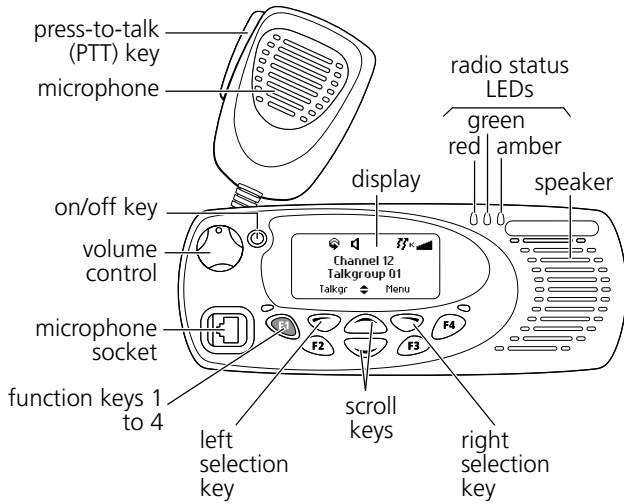
# Menu map



\* These menu functions are restricted to radios programmed for administration services

# Radio controls

For more information about the radio controls, see [“About your radio” on page 3](#).



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# 1 About this guide

This user's guide provides information about the TM9155 mobile radio.

## Safety warnings used in this guide

Within this user's guide, the following warnings are used to alert you to important safety information:



**Warning:** There is a potential risk of death or serious injury.



**Caution:** There is the risk of minor or moderate injury to people.

**Caution:** There is a risk of equipment damage or malfunction.

## Feedback about this guide

Your feedback about this user's guide is welcomed. Please send your questions, comments, or suggestions to Technical Support (support@taitworld.com) or the Technical Support Manager, Tait Electronics Limited, PO Box 1645, Christchurch, New Zealand.

## Changes to this guide

In the interests of improving the performance, reliability, or servicing of the equipment, Tait Electronics Ltd reserves the right to update both the equipment or this user's guide, without prior notice.

## Related documentation

The following documentation is also available for your Tait radio, which you can access from the Tait Technical Support website (<http://support.taitworld.com/>):

- *TM9100 Installation Guide*—covers installing the TM9100 mobile radios, microphones, antennas, emergency switches, and external alert devices.

- *TM9100 Product Safety and Compliance Information*—supplied with each radio. (The same information is included in this user guide.)
- Accessory installation instructions—supplied with each accessory.

## Copyright information

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## Disclaimer

There are no warranties extended or granted by this manual. Tait Electronics Limited accepts no responsibility for damage arising from use of the information contained in this guide or of the equipment and software it describes. It is the responsibility of the user to ensure that use of such information, equipment and software complies with the laws, rules and regulations of the applicable jurisdictions.



# 2 About your radio

This section describes all the various buttons and keys on your radio.

## **This section covers:**

- About your digital radio
- Basic operation
- Using function keys to access frequently used features
- Understanding the radio display
- Using the menus to access settings and features
- Understanding the radio indicators

# About your digital radio

You may notice some differences between digital and analog channels, for example, the lack of static noise in low signal areas and consequently where you notice that coverage is poor.

## Lack of static noise

You may notice the lack of static noise on digital channels. This lack of static is because your digital radio removes the 'noise' from the transmission so that you hear only clear voice.

## Coverage

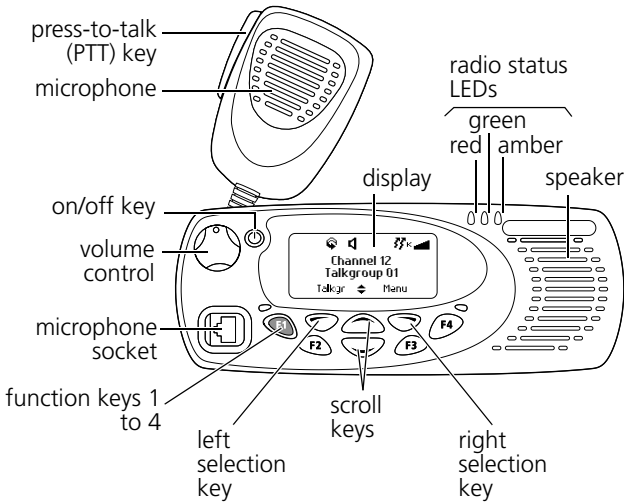
With analog channels, a transmission gets progressively worse when you are in fringe areas or even slightly outside normal coverage areas. However, with digital channels, a transmission remains clear and then drops off quickly at the border of a transmission area. The reason for this is that a digital transmission is either received or it isn't.

# Basic operation

The radio controls are the PTT key, volume control, on/off key, scroll keys, selection keys and function keys. Some keys have functions assigned to both short and long key presses:

- a short key press is less than one second, and
- a long key press is more than one second

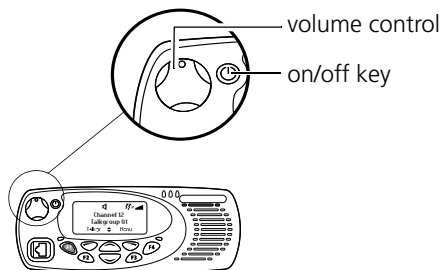
The radio controls and their functions are described in the following sections.



## Turning your radio on and off

**Note:** If your radio has a security lock, you must enter your 'unlock sequence' before you can use the radio. See "Unlocking your radio" on page 41.

A short press of the on/off key turns the radio on. A long press turns the radio off.



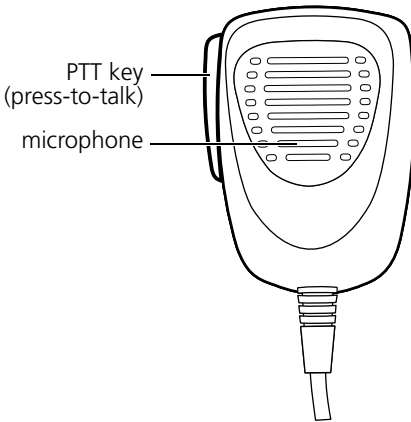
When the radio is first turned on, the red, green, and amber LEDs flash briefly and the radio gives two short beeps. A brief message may appear on the display.

## Adjusting the volume

Rotate the volume control clockwise to increase the speaker volume, and counter-clockwise to decrease the volume. The raised dot indicates the current volume setting.

## About the press-to-talk (PTT) key

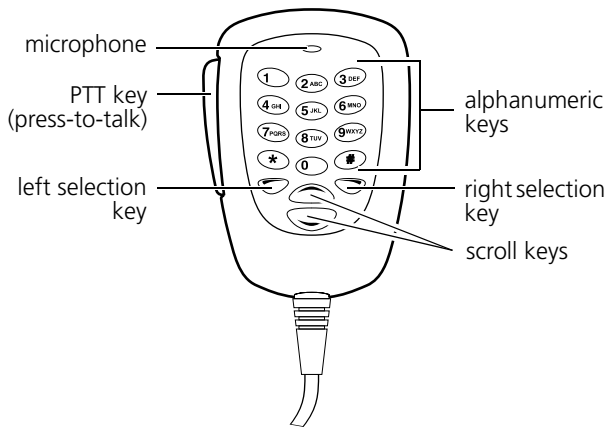
Press and hold the PTT key to talk. Release it to listen.



## About the keypad microphone

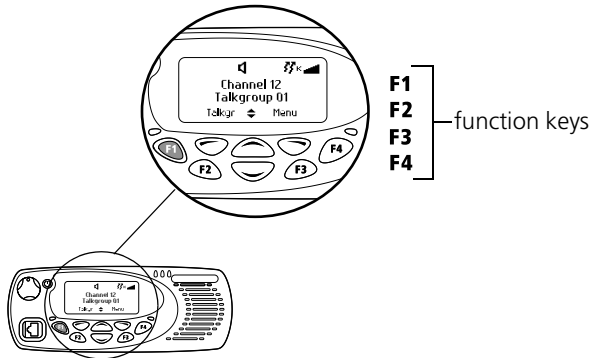
The keypad microphone has a PTT key as well as twelve alphanumeric keys, two scroll keys, and left and right selection keys.

The scroll and selection keys work in the same way as those on the control head (see "Selection keys" and "Scroll keys" on page 10).




# Using function keys to access frequently used features

The function keys provide quick access to some of the features you use most often. The actions that the keys perform depend on how your radio is programmed.



## Emergency key

You can activate emergency mode by pressing the F1 key  if your radio is programmed in this way. (See also “Making an emergency call” on page 21.)

## Viewing your function key settings

You can check which functions are assigned to the function keys.

- 1 Press **Menu** and select **Radio settings > Radio info > Key settings**.
- 2 In the menu list, scroll to a function key and press **Select** to view the function assigned to it.

The example shown is for a function key programmed to turn backlighting on and off:
















- 3 Press a selection key  or  to return to the menu.

# Understanding the radio display

The messages and symbols you see on your radio display depend on the mode in which your radio is operating and the way it is programmed.

These are the various symbols you may see on your radio display:

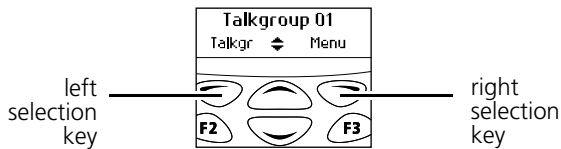
Symbol	Meaning
	Signal strength indicator: the more bars, the stronger the signal being received by your radio
	Transmit: your radio is transmitting
	Low-power transmit: indicates that low power mode is turned on.
	Repeater talkaround: your radio is operating in repeater talkaround mode
	Zone: your radio is operating in this zone (the example shown is zone K)
	Scanning: your radio is monitoring a group of channels for activity
	Monitor or squelch override: monitor or squelch override is active
	Silent operation: your radio's audible tones have been turned off
	Recent calls: a call or message is in the recent calls list
	Scrolling: you can use the scroll keys  or  to move through a list
	External alert: external alert is active.

# Using the menus to access settings and features

You can access settings and features for your radio using the menu.

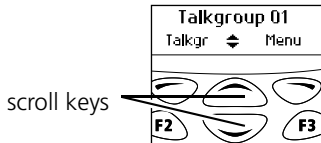
The selection and scroll keys enable you to make selections and move around the menus.

## Selection keys



There are two selection keys beneath the display screen. How these keys work depend on the word that appears above them on the screen.

## Scroll keys



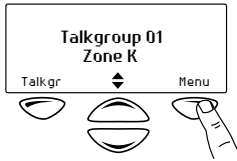
The up and down scroll keys allow you to:

- access the quick access menu
- scroll up and down through a list, and select items
- display the previous or next part of a message that is too long to be displayed on the screen.

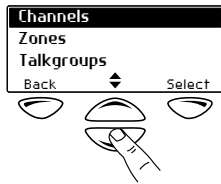


## Accessing the main menu

- 1 To access the main menu, press the right selection key whenever **Menu** appears above it.



- 2 Use the scroll keys to move through the menu list.



- 3 When the menu you want is highlighted, press **Select** to enter the menu you have chosen.



**Tip:** To quickly exit the menu system, press and hold the left selection key when the word Cancel or Back appears above it.



## Accessing frequently used menus

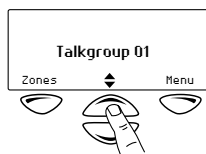
Depending on how your radio is programmed, you may have two different 'quick access' menus. One quick access menu is displayed when you press a scroll key, and the other when you press the left selection key. These give you easy access to the menus you use most often.

### Using the scroll key Quick Access menu

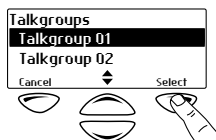
To use this Quick Access menu:

- Press a scroll key  or , and the Quick Access menu appears.

In the example shown below, the Talkgroups menu is the Quick Access menu. Press a scroll key  or  to go directly to the Talkgroups menu:




The Talkgroups menu, with a list of your available talkgroups, is now displayed:

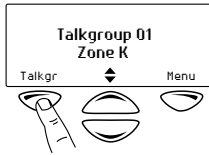


## Using the left selection key Quick Access menu

The text above the left selection key corresponds to the Quick Access menu, for example, Talkgroups.

To use this Quick Access menu:

- Press your left selection key , and the associated menu appears.



# Understanding the radio indicators

The status LED indicators and the radio's audible tones—together with the radio display—all combine to give you information about the state of your radio.

The most common way the indicators work is described in the following sections.

## Audible tones

The radio uses audible sounds (tones and beeps) to alert you to its status:

- Radio controls and keypress tones—the tones and beeps you hear when you press your radio's keys or use the controls. (You can turn these tones off—see “Turning off radio controls and keypress tones (quiet operation)” on page 54.)
- Incoming call tone—when the radio is receiving a call.
- Warning tones—when there is an error.

**Note:** If quiet or silent mode is turned on, you will not hear any alert tones. See “Customizing the audible alert tone settings” on page 52.

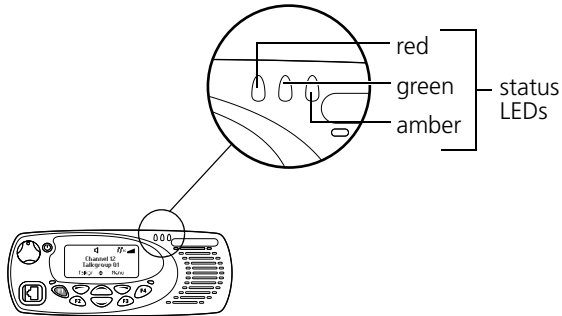
Some of the more common audible beeps are described below:

Tone	Meaning
One short beep	<ul style="list-style-type: none"><li>■ Valid keypress: the action you have attempted is permitted, or</li><li>■ Function activated: a function has been turned on (using either the Main menu or a function key)</li></ul>

<b>Tone</b>	<b>Meaning</b>
One long, low-pitched beep	<ul style="list-style-type: none"> <li>■ Invalid keypress: the action you have attempted is not permitted, or</li> <li>■ Transmission inhibited: you have attempted to transmit, but for some reason transmission is not permitted at this time</li> </ul>
One short, low-pitched beep	Function deactivated: a function has been turned off (using either the Main menu or a function key)
Two short beeps	Radio turned on: the radio is powered on and ready to use

## Status indicators

**Note:** The way these indicators behave may be affected by the way your radio is programmed.



Color	Meaning
Red (transmit)	Glowing: your radio is transmitting Flashing: your transmit timer is about to expire
Green (receive)	Glowing: the current channel is busy Flashing: you have received a call
Amber (scanning)	Glowing: your radio is scanning a group of channels for activity Flashing: your radio has detected activity on a channel, and has halted on this channel

# 3 Making and receiving calls

This section describes how to make and receive calls.

## This section covers:

- Making calls
- Receiving calls
- Communicating directly with other radios
- Call alert paging
- Checking missed calls
- Checking that the channel is clear (monitor)

# Making calls

- 1 Ensure the required zone is selected (see “Selecting a zone” on page 18).
- 2 Ensure the required channel is selected (see “Selecting a channel” on page 19).
- 3 Ensure the required talkgroup or individual radio ID is selected (see “Selecting a talkgroup” on page 21 or “Making an individual call” on page 21).
- 4 Lift the microphone off the microphone clip.
- 5 Hold the microphone about 2 inches (5 cm) from your mouth and press the PTT key to transmit.

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

- 6 Speak clearly into the microphone and release the PTT key when you have finished talking.

While you are transmitting the red LED glows and the transmit icon appears in the display:



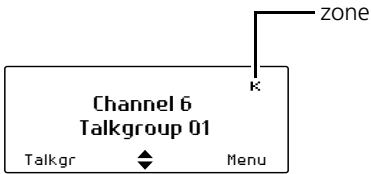
## Selecting a zone

A zone is a collection of channels. Zones are a way of grouping channels, for example, by public safety agency type (fire, police, ambulance, etc.) or by geographical region (Dallas, Houston, etc.).

- 1 Press **Menu** and select **Zones**.
- 2 Scroll to the zone you want and then press **Select**.



Your radio display now shows the zone:



## Selecting a channel

It is important to distinguish between channels and talkgroups: a channel is frequency-related whereas a talkgroup is a group of radio users.

For an explanation of talkgroups, see “Understanding talkgroups” on page 20.

### Using the Main menu

You can select a channel using the Main menu:

- 1 Press **Menu** and select **Channels**.
- 2 Scroll to the channel you want and press **Done**.

### Using a function key

You can use a function key to select a preset channel, if your radio is programmed in this way.

- Press the function key to select a preset channel.

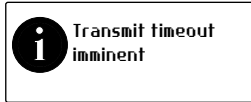
### Using the keypad

If your radio model has an alphanumeric keypad, you can enter a number to select the channel you want.

## Limiting call time (transmit timer)

Your radio may limit the amount of time you can talk (transmit) continuously, if it is programmed in this way. This is known as the transmit or time-out timer and allows other radio users to make calls on that channel.

The radio warns you before the transmit timer expires by beeping three times. Also, the red status LED flashes and a message appears in the display:



Finish your conversation as soon as possible and release the PTT. For a short time, your radio may prevent you from transmitting to allow other radio users to make calls on the channel.

## Understanding talkgroups

**Note:** This feature is available for digital channels only.

Talkgroups are a collection of people (radio IDs) with whom you want to have private conversations as a group.

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 a public safety member in another region. 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.

## Making a talkgroup call

- To make a call to the currently selected talkgroup, press the PTT.

## Selecting a talkgroup

You can select a new talkgroup (if your radio is programmed in this way):

- 1 Press **Menu** and select **Talkgroups**.
- 2 Scroll through the list of talkgroups to the one you want and press **Select**.
- 3 Press the PTT to make a call to the talkgroup.

You can also select a new talkgroup using speed dialling. The first 10 talkgroups are available using the alphanumeric keypad—keys 1-9 and 0 correspond to talkgroups 1-10.

## Making an emergency call

For information about making and ending emergency calls together with an explanation of how your radio behaves in emergency mode, see “About emergency calls” on page 42 and “Understanding emergency mode” on page 43.

## Making an individual call

**Note:** This feature is available for digital channels only.

You can make a call to one person rather than a group of people.

## Using the Main menu

You can also use speed dialling, or the Main menu:

- 1 Press **Menu** and select **Individual call**.

- 2 Scroll to the person you want to call and press **Select**.
- 3 Press the PTT to make the call.
- 4 Press Cancel to end the call.

### Using a function key

You can make an individual call by pressing a function key, if your radio is programmed in this way.

- 1 Press the function key.

The last person (radio ID) to whom you made an individual call appears in the display.

- 2 Press the PTT to call the person or radio shown.

## Receiving calls

When a valid signal is received the radio unmutes and you can hear the call.

### Identifying a caller (talking party ID)

**Note:** This feature is available for digital channels only.

You can identify the radio user who is calling you using Talking Party ID. (This feature is enabled by default.)

When you are in a call, you can select Talking party ID from the menu. If you are in a talkgroup call, the name of the talkgroup is displayed. If you are in an individual call, the name of the radio ID from your call list together with the radio ID is displayed (if there is no associated name, only the radio ID is shown).

### Turning talking party ID off and on

- 1 Press **Menu** and select **Radio settings > Display settings > Talking party ID**.
- 2 Scroll to **Off** (or **On**) and press **Select**.

The message **Talking party ID activated** (or **Talking party ID deactivated**) appears in the display:



## Communicating directly with other radios

You can bypass the radio repeater and communicate directly with another radio. This feature is known as repeater talkaround.

You can do this, for example, when you are out of range of the repeater, or if the repeater is busy or stops working for whatever reason.

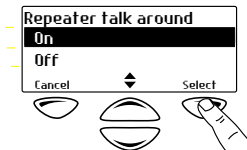
While repeater talkaround is active, all transmissions are made on the receive frequency of the channel you are on.


## Turning repeater talkaround on and off

### Using the Main menu

You can turn repeater talkaround on and off using the Main menu:

- 1 Press **Menu** and select **Radio settings > Functions > Repeater talkaround**.
- 2 Scroll to **On** (or **Off**) and press **Select**.



The message **Repeater talkaround activated** (or **Repeater talkaround deactivated**) appears and the repeater talkaround symbol  appears in the display.



- 3 Change to the required channel and proceed with your call.

### Using a function key

You can turn repeater talkaround on and off using a function key, if your radio is programmed in this way.

- Press the function key to turn repeater talkaround on. It remains on until you press the function key again.

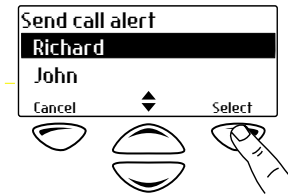
# Call alert paging

**Note:** This feature is available for digital channels only and applies to individual calls only.

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 together with your radio ID, they can call you back when it is convenient.

## Sending a call alert page


- 1 Press **Menu** and select **Services** > **Send call alert**.
- 2 Select the radio unit ID from the call list and press **Send To**.



A message appears in the display:



## Answering a call alert page

If you receive a call alert page from another radio user, the call queue symbol  appears in the display.

To access the call queue and return the call:


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

The oldest calls are displayed at the top of the queue; the most recent calls are displayed at the bottom.

- 2 Scroll through the list of queued calls until the call you want appears, and then press **Done**.
- 3 Press **Options** to open the Call Queue Options menu.
- 4 Select **Call** to return the call or **Delete** to delete it.

## Checking missed calls

**Note:** This feature is available for digital channels only and applies to individual calls only.

If you have missed an incoming call, it is saved in the call queue so you can return the call later. The call queue symbol  appears in the display.

See also “Checking received messages” on page 37 and “Answering a call alert page” on page 25.

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

The oldest calls are displayed at the top of the queue; the most recent calls are displayed at the bottom.

- 2 Scroll through the list of queued calls until the call you want appears, and then press **Done**.
- 3 Press **Options** to open the Recent Calls Options menu.
- 4 Select **Call** to return the call or **Delete** to delete it.



# Checking that the channel is clear (monitor)

Monitor allows you to hear if there is any traffic (including talkgroup and individual calls) on a channel. For analog channels, this is so that you can check that it is clear before you make a call.

## Turning monitor on and off

### Using the microphone hookswitch

Your radio may be programmed to turn monitor on whenever the microphone is removed from the microphone clip. Monitor is turned off when the microphone is replaced.

### Using the Main menu

You can turn monitor on and off using the Main menu:

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

### Using a function key

You can turn monitor on and off using a function key, if your radio is programmed in this way.

- Press the function key to turn monitor on. It remains on until you press the function key again.

# 4 Listening to channel traffic

This section describes scanning a group of channels for activity, and using the squelch override function to hear faint and noisy signals on a channel.

## **This section covers:**

- Scanning a group of channels
- Understanding the different types of scanning
- Selecting a scan group
- Making a call while scanning
- About nuisance delete
- Editing a background scan group
- Hearing faint and noisy signals
- Turning squelch override on and off

# Scanning a group of channels

The scanning feature is used to monitor a pre-programmed group of channels for activity. When a busy channel is detected in a group, the radio stops on ('captures') that channel, and you can now hear the transmission. Scanning resumes when the channel is no longer busy.

**Note:** 'Priority' channels may be specified when the radio is programmed. These are channels that you want the radio to check for activity more often than other 'non-priority' channels. Priority channels are scanned periodically when a non-priority channel is busy.

## Understanding the different types of scanning


The two types of scanning that may be available on your radio are *standard* scanning and *background* scanning. Background scan can only be activated using a function key programmed for background scan. When you activate background scan, the currently selected channel automatically becomes a member of the scan group.

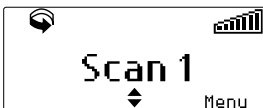
## Selecting a scan group

### Using a function key

You can use a function key to select a preset scan group, if your radio is programmed in this way.

- Press the function key to select a preset scan group and activate scanning.

The programmed scan group is now shown in the display (standard scan only), the amber LED glows and the scanning icon  appears in the display.

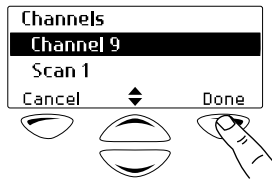



## Using the Main menu

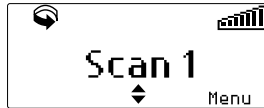
You can select a scan group using the Main menu, if your radio is programmed in this way.

**Note:** This method is only available for standard scan.

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



The amber LED glows and the scanning icon  appears in the display:



## Making a call while scanning

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

- 1 Lift the microphone off the microphone clip.
- 2 Press the PTT key to transmit.

If the amber LED is flashing, or background scan is active, your radio will now call the currently selected channel.

If standard scan is active and there has been no recent activity on the channel (the amber LED is glowing rather than 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, or
  - your radio calls the last free channel.
- 3 When the called party responds, proceed with your conversation.

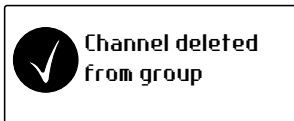
## About nuisance delete

If the radio is continuously stopping on an undesired channel (for example, if there is too much activity or even interference) while scanning, you may be able to temporarily remove this channel from the scan group.

### Removing a channel from a scan group

When the radio has stopped on the channel that you want to remove from the scan group, press the function key programmed for this purpose.


If the channel has successfully been removed from the scan group, the message **Channel deleted from group** appears in the display:



Scanning automatically begins again. The channel remains removed from the scan group until you either select another scan group or the radio is turned off and then on again.

## Editing a background scan group


Your radio may be programmed so that you can permanently change the membership of your background scan group by using the function key programmed for nuisance delete.

When background scan is active, you can scroll through the channel list to see which channel is a member of your background scan group. When the channel is a group member, the scanning icon  includes a tick.

**Note:** The function key programmed to activate your background scan group may be programmed so that a short key press activates background scan and a long key press activates nuisance delete.

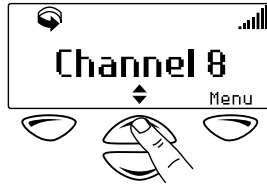
## Adding a channel to your background scan group

- 1 Press the function key that activates background scan.

The amber LED glows and the scanning icon  appears in the display.



- 2 Scroll through the list of channels until the channel that you want to add appears.




- 3 Press the nuisance delete key and this channel is now added to your background scan group.

The message **Channel added** appears in the display and the scanning icon  now includes a tick.



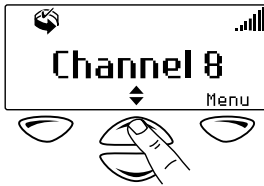
## Removing a channel from your background scan group

- 1 Press the function key that activates background scan.


The amber LED glows and the scanning icon  appears in the display.



- 2 Scroll through the list of channels until the channel that you want to delete appears.



- 3 Press the nuisance delete key and this channel is now deleted from your background scan group.

The message **Channel deleted** appears in the display and the scanning icon  no longer includes a tick.



# Hearing faint and noisy signals

Usually, the radio prevents you from hearing faint or noisy calls on a channel (known as 'squelch'). Without squelch, the radio would 'chatter' on and off in low signal strength areas, for example, which can be annoying.

However, there may be occasions when you want to hear what is being said on a channel, even if it is hard to understand. You can do this using the squelch override feature, which allows you to listen to *everything* on the channel.

This feature is more applicable for analog channels. For digital channels, use the Monitor feature (see page 27).

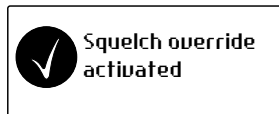
## Turning squelch override on and off

### Using the Main menu

You can turn squelch override on and off using the Main menu:

- 1 Press **Menu** and select **Radio settings > Functions > Squelch override**.
- 2 Scroll to **On** (or **Off**) and press **Select**.

The message **Squelch override activated** (or **Squelch override deactivated**) appears in the display:



### Using a function key

You can use a function key to turn squelch override on and off, if your radio is programmed in this way.

- Press the function key to turn squelch override on. It remains on until you press the function key again.



# 5 Sending and receiving messages

This section describes sending and receiving messages as well as responding to requests for status information.

## This section covers:

- About messages
- Sending a message
- Checking received messages
- Informing other radio users of your status
- Sending a status update
- Requesting a status update

# About messages

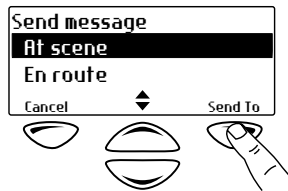
**Note:** This feature is available for digital channels only.

You can send short messages to another radio user. These messages are defined at programming time and are known variously as 'pre-programmed messages', 'short data messages' (SDMs), or 'short messages'.

**Note:** The person to whom you are sending a message must have the same message programmed into their radio so that he or she can read your message.

## Sending a message

- 1 Press **Menu** and select **Services > Send message**.
- 2 Select the message you want from the message list and press **Send to**.



**Note:** The person or group to whom the message is sent depends on how your radio is programmed. You may be able to send messages to whomever you choose or your radio may be programmed to automatically send messages to the current talkgroup or a specific person (such as the dispatcher).


- 3 (Optional, depending on how your radio is programmed. See note above.) Select the recipient (radio unit ID) from the call list or enter their radio unit ID using the alphanumeric keypad.
- 4 Press the PTT or select **Send to**.

The red LED glows and the message details appear in the display:



A message will be displayed to advise you whether the message has been sent successfully or not.

## Checking received messages

If you have received a message, it is saved in the call queue so you can view the message later. The call queue symbol  appears in the display.

**Note:** Up to 10 messages are stored. If more than that are received, the oldest messages will be deleted to make room for new messages.

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

The oldest calls are displayed at the top of the queue; the most recent calls are displayed at the bottom.

- 2 Scroll through the list of queued calls until the message you want appears, and then press **Select**.
- 3 Press **Options** to open the Call Queue Options menu.
- 4 Select **View** to read the message or **Delete** to delete it.

**Tip:** To quickly clear the message list, turn the radio off and then on again.

# Informing other radio users of your status

**Note:** This feature is available for digital channels only.

## Sending a status update

You can inform other radio users or the dispatcher of your current status by sending them a status update, for example, 'At scene'.

**Note:** When you send a status message, you are also *setting* your status, which the dispatcher can check by 'interrogating' your radio. You can change your status at any time by selecting another status message and sending it.

To inform another radio user or the dispatcher of your current status:

- 1 Press **Menu** and select **Services > Status > Send update**.
- 2 Select the status message you want from the message list and press **Send to** or **Select**.



**Note:** The person or group to whom the status message is sent to depends on how your radio is programmed. You may be able to send status messages to whomever you choose, or your radio may be programmed to automatically send status messages to the current talkgroup or a specific person (such as the dispatcher).

- 3 (Optional, depending on how your radio is programmed. See note above.) Select the recipient (radio unit ID) from the call list or enter their radio unit ID using the alphanumeric keypad and press **Send to**.

While the radio sends the message, the red LED glows.

## Requesting a status update

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

To ask another radio user to inform you of their current status:

- 1 Press **Menu** and select **Services > Status > Query**.
- 2 Use the keypad to enter the radio ID of the radio user to whom you want to send the status query, or select the radio ID from the call list.
- 3 Press the PTT to send the status update request.

# 6 Safeguarding you and your radio

This section describes how to prevent unauthorized use of your radio as well as how to get help when you need it most.

## **This section covers:**

- About locking your radio
- About emergency calls

# About locking your radio

You can lock your radio to prevent unauthorized use, if this feature is programmed for your radio. When your radio is locked, you can only make emergency calls. Your radio can still receive calls and status requests, but you must unlock the radio to respond to them.

Your radio will remain locked even if it is turned off and then on again.

## Locking your radio

You can lock your radio by either:

- turning it off and then on again, or
- using the menu.

### Using the menu to lock your radio

- 1 Press **Menu** and select **Radio settings > Function settings**.
- 2 Scroll to **Lock** (or **Unlock**) and press **Select**.

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

## Unlocking your radio

- To unlock your radio, use the 'unlock sequence' you have been given. (This is a pre-programmed sequence of four keys.)



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.

# About emergency calls

In an emergency you can summon help by sending an emergency call. There are two types of emergency calls:

Call type	Explanation
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.
Emergency call	Typically for life and death situations. When an emergency call is initiated, the radio enters 'emergency mode'. For further information see "Understanding emergency mode" on page 43.

## Making a priority call

**Note:** This feature is available for digital channels only.

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.

### Using the Main menu

You can turn the priority call feature on and off using the Main menu:

- 1 Press **Menu** and select **Emergencies > Priority mode**.
- 2 Scroll to **On** (or **Off**) and press **Select**.

### Using a function key

You can turn priority call on and off using a function key, if your radio is programmed in this way.



- Press the function key to turn the priority call feature on. The priority call feature remains on until you press the function key again.

## Understanding emergency mode

When you press the emergency key your radio enters ‘emergency mode’, if your radio is programmed in this way.

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.

**Note:** The way your radio behaves in emergency mode depends on how your radio is programmed.

For further information on what your radio may do in emergency mode, see “What happens during an emergency call?” on page 44.

### Stealth and non-stealth emergency modes

Depending on what your work involves, 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).

## What happens during an emergency call?

The exact 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.

When the emergency button is pressed:

①

The radio continually sends alerts to the dispatcher until a response is received. Details of your location may also be sent (if this feature is available for your radio).



②

The radio alternately transmits and receives so the dispatcher can hear what is happening in the vicinity of your radio.

(Non-stealth emergencies end once this phase is complete or when you end emergency mode.)



③

**Stealth emergencies only:** The radio is inactive, but it can receive special 'messages' from the dispatcher so that he or she can hear what is happening in the vicinity of the radio.

(Stealth emergencies end once this phase is complete or when you end emergency mode.)

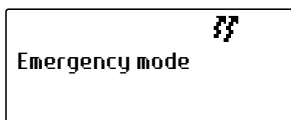
See also "Stealth and non-stealth emergency modes" on page 43.

## Making an emergency call

You can activate emergency mode using a function key or a hidden switch, if your radio is set up in this way.

- 1 Press the function key or hidden switch to activate emergency mode, or press **Menu** and select **Emergencies > Emergency mode > Emergency mode**.

In non-stealth emergencies, 'Emergency mode' appears in 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 44.

**Note:** 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.

- 2 Turn the radio off and on again to end emergency mode (including 'false powerdown'). The radio returns to normal operation.

# 7 Customizing your radio

This section describes the ways in which you can customize your radio.

## **This section covers:**

- About display and keypad backlighting
- Reducing power consumption
- Customizing the audible alert tone settings
- Receiving calls when away from a vehicle

# About display and keypad backlighting

Whenever a key is pressed or a call is received, the keypad and display light up automatically to make it easy to read in poor light conditions.

Backlighting usually remains on for a few seconds, unless further radio activity is detected. The period of time that the backlighting remains on once no further radio activity is detected is determined by the backlighting timer. The duration of this timer is set when the radio is programmed.

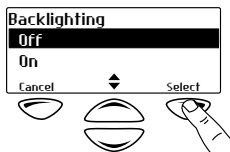
The radio's display can also be made darker or lighter to suit your working conditions. See "Adjusting the display contrast" on page 48.

## Turning backlighting on or off

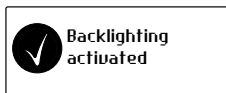
### Using the Main menu

You can turn backlighting on and off using the Main menu:

- 1 Press **Menu** and select **Radio settings > Display settings > Backlighting**.
- 2 Scroll to either **On** or **Off** and press **Select**. (The current setting is highlighted.)



The message **Backlighting activated** (or **deactivated**) appears in the display.



## Using a function key

You can turn backlighting on and off using a function key, if your radio is programmed in this way.

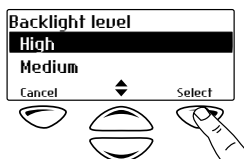
- Press the function key to turn backlighting on. It remains on until you press the function key again.

**Note:** You can turn backlighting on momentarily using a function key, if your radio is programmed in this way. Backlighting remains on for a few seconds and then turns off.

## Adjusting the backlighting level

You can change the level of your radio's backlight to make the display or keypad easier to read in low lighting conditions.



- 1 Press **Menu** and select **Radio settings > Display settings > Backlight level**.
- 2 Scroll to the setting you want (high, medium, or low) and press **Select**. (The current setting is highlighted.)

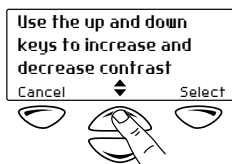


## Adjusting the display contrast

You can change the contrast of your radio display to suit the lighting conditions that you are working in.

- 1 Press **Menu**, and select **Radio settings > Display settings > Contrast adjust**.

- 2 Use the scroll keys  or  to adjust the display contrast to the level you want.



- 3 Press **Select** to accept the setting.

# Reducing power consumption

You can reduce the power consumption of your radio (and thereby reduce the drain on your vehicle battery) in two ways:

- transmit at low power (if your radio is not already configured to do this)
- turn off backlighting when it is not required (see “About display and keypad backlighting” on page 47).

## Turning low power transmit on and off

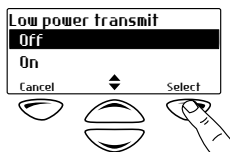
If you are using your radio in conditions where signal strength is high, you can reduce the drain on your vehicle battery by transmitting at low power.

When low power transmit is turned on, transmissions are made at low power rather than at the preprogrammed power setting. However, some channels may be preprogrammed to always transmit at low power.


### Using the Main menu

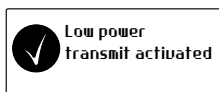
You can turn low power transmit on and off for all channels using the Main menu:

- 1 Press **Menu** and select **Radio settings > Function settings > Low power transmit**.
- 2 Scroll to **On** (or **Off**) and press **Select**.





The message **Low power transmit activated** (or **deactivated**) appears. When you next transmit, the low power transmit icon  appears in the display, and the red LED glows.



## Using a function key

You can turn low power transmit on and off using a function key, if your radio is programmed in this way.

- Press the function key to turn low power transmit on for all channels. It remains on until you press the function key again.

# Customizing the audible alert tone settings

The radio uses audible sounds (tones and beeps) to alert you to its status:

- Incoming call tone—when the radio is receiving a call.
- Warning tones—when there is an error.
- Radio controls and keypress tones—the tones and beeps you hear when you press your radio’s keys or use the controls. (You can turn these tones off—see “Turning off radio controls and keypress tones (quiet operation)” on page 54.)

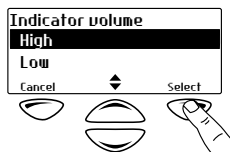
## Changing the volume of all audible tones

You can set the volume of all the audible sounds (‘status indicators’), which the radio makes to indicate what is happening.

### Using the Main menu

You can change the volume of the audible tones between high or low using the Main menu:

- 1 Press **Menu** and select **Radio settings > Alert settings > Indicator volume**.
- 2 Scroll to **High** or **Low** and press **Select**. (The current setting is highlighted.)



### Using a function key

You can change the volume of the audible tones between high or low using a function key, if your radio is programmed in this way.

- Press the function key to set the volume. The volume setting remains until you press the function key again.

## Changing the keypress volume

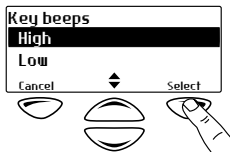
Whenever you press a key on the control head, you will hear a beep to indicate whether or not what you are trying to do is allowed:

- Allowed: a short, medium-pitched beep.
- Not allowed: a long, low-pitched beep.

### Using the Main menu

You can change the volume of the keypress beeps between high, low, and off using the Main menu:

- 1 Press **Menu** and select **Radio settings > Alert settings > Key beeps**.
- 2 Scroll to **High**, **Low**, or **Off** and press **Select**. (The current setting is highlighted.)



### Using a function key

You can switch the volume of the keypress beeps between high, low, and off using a function key, if your radio is programmed in this way.

- Press the function key to change the volume. The volume setting remains until you press the function key again.

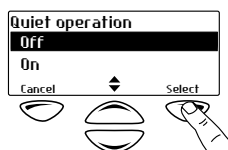
## Turning off radio controls and keypress tones (quiet operation)

You can turn off all the tones and beeps you hear when you press the keys or use the radio controls. This is known as quiet operation. You will still hear incoming call and warning tones.

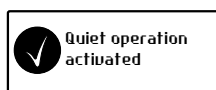
### Using the Main menu

You can turn quiet operation on and off using the Main menu:

- 1 Press **Menu** and select **Radio settings > Alert settings > Quiet operation**.
- 2 Scroll to **On** or **Off** and press **Select**. (The current setting is highlighted.)



The message **Quiet operation activated** (or **deactivated**) appears.




### Using a function key

You can turn quiet operation on and off using a function key, if your radio is programmed in this way.

- Press the function key to turn quiet operation on. It remains on until you press the function key again.

## Hearing only channel traffic (silent operation)

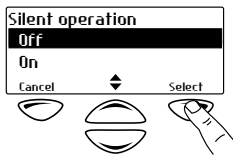
You can turn off all the audible tones that the radio makes so that the only sound you will hear from the speaker is channel traffic. This is known as silent operation.


When silent operation is turned on  appears in the display.

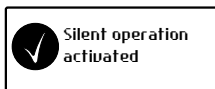
### Using the Main menu

You can turn silent operation on and off using the Main menu:

- 1 Press **Menu**, and select **Radio settings > Alert settings > Silent operation**.
- 2 Scroll to **On** or **Off** and press **Select**. (The current setting is highlighted.)



The message **Silent operation activated** (or **deactivated**) appears and the silent operation symbol  appears in the display.



### Using a function key

You can turn silent operation on and off using a function key, if your radio is programmed in this way.

- Press the function key to turn silent operation on. It remains on until you press the function key again.

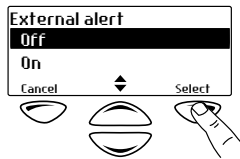
# Receiving calls when away from a vehicle


If you are away from your vehicle and out of hearing range of your radio, you can have, for example, the vehicle horn or a siren sound to notify you when a call is received. The siren or horn continues to sound for a period of time and then turns off.

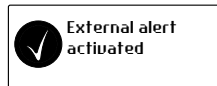
**Note:** You can only use this feature if an external alert device is fitted to your radio. Refer to the *TM9100 Installation Guide* for fitting instructions.

## Turning external alert on and off

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



The message **External alert activated** (or **deactivated**) appears and the external alert symbol  appears in the display.



# 8 Troubleshooting

This section describes troubleshooting procedures and basic maintenance.

## **This section covers:**

- Troubleshooting
- Error messages
- When your radio won't turn on
- Checking the version of your radio
- Removing the microphone
- General care
- Cleaning the radio




# Troubleshooting

If you are experiencing difficulty operating your Tait radio, you may find the following sections helpful. Consult your radio provider for assistance, if necessary.

## Error messages

If an error message appears in the radio display, refer to the table below.

For any error messages not shown in the table below, it is recommended that you make a note of the error code (the letter 'E' followed by a four-digit number, for example, E0001) and consult your radio provider.

Error message	What you must do
 Error E0001 Unknown Reboot radio	Turn the radio off and back on again.
 Error E0007 Microphone Missing	Attach a microphone to the radio control head. If a microphone is already attached, consult your radio provider.
 Error E0009 High Temp Stop Tx	The radio is very hot—turn it off and allow it to cool down.



## When your radio won't turn on

If the red, green and amber LEDs on the control head do not light up when the radio is turned on, it is probable that power is 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.

## Checking the version of your radio

Your radio provider may ask you for the hardware / firmware version of your radio for troubleshooting purposes.

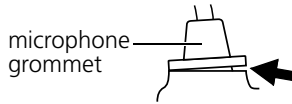
You can check the version of your radio by using the Main menu:

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

## Removing the microphone

**Note:** For information on installing or removing your radio from a vehicle, refer to the "TM9100 Installation Guide".

- 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.



**Important:** Remove the grommet carefully as it serves two important functions. Firstly, it prevents damage to the microphone socket due to movement of the microphone cord, and secondly, it ensures that the control head is sealed against water, dust, and other environmental hazards.

- 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.

# General care

Your Tait 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 cover, do not allow the radio to come into contact with detergents, alcohol, aerosol sprays or petroleum-based products.

## Cleaning the radio

If you need to clean the radio cover, use a cloth dampened with clean water. Do not immerse the radio in fluids.

# 9 Glossary

## A

**APCO** The Association of Public Safety Communications Officials, International (<http://www.apcointl.org/>). The APCO Project 25 standards committee defined a digital radio standard. The standard is often referred to APCO or P25.

## C

**channel** A channel is a pair of frequencies used to transmit and receive radio signals.

## F

**FCC** Federal Communications Commission. The FCC is an independent United States government agency that regulates interstate and international radio communications.

**frequency band** A range of frequencies used for transmitting or receiving radio waves, for example, 136-174 MHz.

## L

**LED** Light Emitting Diode. A device that emits light when charged with electricity.

## P

- P25** Project 25. The Association of Public Safety Communications Officials (APCO) established Project 25 (P25). This project was led by United States Federal, state, and local government representatives to develop standards for interoperable digital radios and systems to meet the needs of public safety users. See <http://www.project25.org> for further information.

## R

- repeater** A repeater is a relaying site, usually situated above a city or town, for example, on a hill, that receives and re-transmits signals received from radios.

- repeater talkaround** In repeater talkaround mode radios transmit and receive directly with other radios on a single frequency (known as simplex operation) without the need for a repeater.

- RF** Radio Frequency is the signal (radio waves) that the radio transmits and receives. The frequency of the signal is described in terms of the number of cycles per second or Hertz (Hz). RF is part of the electromagnetic spectrum, as is sunlight.

- RSSI** RSSI (Received Signal Strength Indicator) is a level that indicates the strength of the received signal.

## V

- valid signal** A valid signal is a signal that the radio responds to by unmuting the receiver. A signal is valid, for example, when it is stronger than a minimum level.

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# Notes

Notes



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