

TP9100 P25 Portable Radios **User's Guide**

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AU2015904806, EU000915475-0001, EU000915475-0002, UK1518031.8, US8301682, US13/542147, US14/032876, US14/495334, US14/725922, US14/818712, US14/832420, US62/128101, US62/128129, US640974, US640977, US698339, US702666, US7758996, US7937661, US8902804, US9107231.

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Angled volume knob produced under license from Motorola Solutions Inc., U.S. Patent No. 5,784,688.

Environmental responsibilities



Tait Limited is an environmentally responsible company which supports waste minimization, material recovery and restrictions in the use of hazardous materials.

The European Union's Waste Electrical and Electronic Equipment (WEEE) Directive requires that this product be disposed of separately from the general waste stream when its service life is over. For more information about how to dispose of your unwanted Tait product, visit the Tait WEEE website at www.taitradio.com/weee. Please be environmentally responsible and dispose through the original supplier, or contact Tait Limited.

Tait Limited also complies with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive in the European Union.

In China, we comply with the Measures for Administration of the Pollution Control of Electronic Information Products. We will comply with environmental requirements in other markets as they are introduced.

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 radio frequency (RF) exposure guidelines of the United States Federal Communication Commission's (FCC), Industry Canada, and those from other administrations, 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.

- When listening and talking on the radio, hold it upright in front of your face so that it is at least one inch (2.5cm) away from any part of your face. Keeping the radio at the recommended distance is important because exposure to RF decreases rapidly the further away the antenna is from your body.
- Keep the antenna at least one inch (2.5cm) from your face at all times.
- If you wear your radio, you must always put it in a carrying accessory that has been specifically approved by Tait for this radio. Using non-approved body-worn accessories may mean you expose yourself to higher levels of RF than recommended by the FCC's occupational/controlled environment RF exposure limits.
- Ensure you only use Tait-approved antennas, batteries, and accessories.

For more information on what RF energy is and how to control your exposure to it, visit the FCC website at 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 2.1093.
- 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.
- European Directive 2004/40/EC on minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields).

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.

Conformité aux normes d'exposition à l'énergie RF

Cette radio émetteur-récepteur se conforme aux normes et aux règlements d'exposition à l'énergie RF :

- La Commission fédérale de la communication des Etats-Unis, Code de règlements fédéraux (CFR) Titre 47 Sections 1.1307, 1.1310 et 2.1091 (radios mobiles) ou 2.1093 (radios portatives).
- 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.
- La directive européenne 2004/40/EC concernant les prescriptions minimales de sécurité et de santé relatives à l'exposition des travailleurs aux risques dus aux agents physiques (champs électromagnétiques).

Cette radio se conforme aux limites d'exposition de l'IEEE (FCC) et ICNIRP pour les environnements d'exposition au rayonnement RF professionnel et contrôlé aux cycles de marche de 50% en mode transmission et 50% en mode réception.

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.

Radio frequency emissions limits in Canada

This device complies with Industry Canada licence exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

USA public safety bands (764–776MHz and 794–806MHz)

The Code of Federal Regulations (CFR) Title 47 Subpart R deals with the use of frequencies in the 764 to 776MHz and 794 to 806MHz bands.

Low-power channels

This radio complies with §90.531 (b) (3) and §90.531 (b) (4) of 47 CFR. These sections state that only low-power transmission is permitted on the following channels:

- Regional Planning channels, as defined in §90.531 (b) (3).
- Itinerant channels, as defined in §90.531 (b) (4).

Use of encryption

This radio complies with §90.553 (a) of 47 CFR. This states that:

- Encryption is not permitted on the nationwide Interoperability calling channels. These channels are defined in §90.531 (b) (1) (ii).

- Radios using encryption must have a readily accessible switch or control to allow the radio user to disable encryption.

EMC regulatory compliance in Australia



This product meets all ACMA regulatory requirements for electromagnetic compatibility (EMC). For more information about EMC compliance, visit the ACMA website at www.acma.gov.au.

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.

Health, safety and electromagnetic compatibility in Europe

In the European Community, radio and telecommunications equipment is regulated by Directive 1999/5/EC, also known as the Radio and Telecommunications Terminal Equipment (R&TTE) directive. The requirements of this directive include protection of health and safety of users, as well as electromagnetic compatibility.

Intended purpose of product

This product is an FM radio transceiver. It is intended for radiocommunication in the Private Mobile Radio (PMR) or Public Access Mobile Radio (PAMR) services, to be used in all member states of the European Union (EU) and states within the European Economic Area (EEA).

Restrictions

This product can be programmed to transmit on frequencies that are not harmonized throughout the EU/EEA, and will require a licence to operate in each member state.

This product can be programmed for frequencies or emissions that may make its use illegal. Where applicable, a license must be obtained before this product is used. All license requirements must be observed. Limitations may apply to transmitter power, operating frequency, channel spacing, and emission.

Declaration of conformity

Brief Declarations of Conformity appear on [page 159](#) of this booklet. To download the formal declaration of conformity, go to www.taitradio.com/eudoc.

Interference with electronic devices



Warning 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:

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

Switch off the radio before boarding an aircraft. Using your radio while in the air is not permitted.

Consult the manufacturer (or its representative) of any such electronic devices to determine whether electronic circuits in those devices will perform normally when the radio is transmitting.



Warning If you have a pacemaker:

- immediately turn off the radio if you suspect it is interfering with the pacemaker
- keep the radio at least 6 inches (15cm) from the pacemaker while the radio is on
- use the radio on the side opposite to the pacemaker to minimize interference
- never carry the radio in a breast pocket.

If there is interference between your hearing aid and the radio, please discuss an alternative solution with the hearing aid manufacturer.

Potentially explosive atmospheres and blasting areas



Warning Unless the radio is specifically certified for use in a potentially explosive atmosphere, turn off the radio before entering such an atmosphere. An explosion could cause serious injury or death. Examples of potentially explosive atmospheres include filling stations, and any environment where there are flammable liquids, gases, or dusts.






Warning Turn off the radio before approaching blasting caps, a blasting area, or any area where you are instructed to turn off a two-way radio. Obey all signs and instructions. Interference with blasting operations could cause serious injury or death.

Intrinsically Safe radios

Intrinsically Safe (IS) radios are certified by a third party to be safe to use in particular hazardous locations.

One or more of the following marks identifies a TP9100 radio as an IS radio:

- an IS circle logo on the radio's front panel 
- a label on the radio, showing IS information and the FM diamond logo 

- a label on the radio battery, showing IS information and the FM diamond logo .

IS radios and batteries must not be engraved or modified in any way.

An IS radio must be serviced only by an agency certified by both the approval authority and by Tait Limited. Any unauthorized repair or substitution of parts invalidates the intrinsic safety rating and the third party IS approval. To have an IS radio serviced, return it to an authorized Tait branch or subsidiary.

Intrinsically safe TP9100 radios and accessories are approved by Factory Mutual Corporation (FM) to the following ratings:

- IS / I, II, III / 1 / CDEFG / T3C, Ta=40°C; IP54
- NI / I / 2 / ABCD / T3C, Ta=40°C; IP54

TP9100 portable radios with the product code "TPAxxx-xx01x" have FM IS approval.



Warning Use only an IS-approved battery with an IS radio, and do not charge the battery in a hazardous location. An explosion could cause serious injury or death.

Use only IS-approved accessories with IS radios. For an up-to-date list of FM-approved accessories, go to the Tait website or contact your nearest Tait office.



Warning IS certification applies only while the product is used in accordance with these instructions.

Radio installation and operation in vehicles



Warning Keep the radio away from airbags and airbag deployment areas. Do not install, charge, or place a radio near such areas. An activated airbag can propel a portable radio with sufficient force to cause serious injury to vehicle occupants. An airbag may not perform to specification if obstructed by a radio.



Warning To avoid damage to existing wiring, airbags, fuel tanks, fuel and brake lines, or battery cables, refer to

the installation guide for the radio, and to the vehicle manufacturer's manual, before installing electronic equipment in the vehicle.

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.

Vehicle charger installation and operation

For detailed instructions necessary to the safe installation and operation of the vehicle charger, please refer to the documentation supplied with the vehicle charger.

Multicharger safety information



Warning This device must be connected to an earthed mains socket-outlet.

Norsk (no): Apparatet må tilkoples jordet stikkontakt.

Suomi (fi): Laite on liitettävä suojamaadoituskoskettimilla varustettuun pistorasiaan.

Svenska (sv): Apparaten skall anslutas till jordat uttag.

Electromagnetic compatibility in European vehicles

In the European Community, radio equipment fitted to automotive vehicles is regulated by Directive 72/245/EEC and its amendments. The requirements of this directive cover the electromagnetic compatibility of electrical or electronic equipment fitted to automotive vehicles.

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. Failure to do so could invalidate compliance requirements and void the user's authority to operate the radio.

Engraving and modification of intrinsically safe radios



Warning Intrinsically Safe (IS) radios and batteries must not be engraved or modified in any way. For more information on IS radios refer to ["Intrinsically Safe radios" on page 16](#).

Engraving a magnesium chassis will void warranty

Notice Engraving the magnesium chassis of an older radio can significantly reduce its mechanical strength and will void any warranty. The magnesium chassis is metallic black and painted. The aluminium chassis of newer radios is silver gray and unpainted. If a magnesium chassis has been engraved, it must be replaced.

Attaching of labels



Warning Do not obstruct the vent hole on the battery. If the vent on the battery is obstructed, the battery may explode, causing personal injury and/or damage to property.



Caution Tait recommends that you do not affix additional labels to the surfaces between the radio chassis and the battery. The fit between these surfaces is intentionally firm and any added thickness will damage the points of attachment between radio and battery. If you must attach a customized label, use only a thin gummed paper label applied to the bottom 25% of the radio chassis label and/or to the top 25% of the battery label. Do not obstruct the vent holes (see Warning above). Do not allow the paper label to extend beyond the recessed label area or to conceal relevant product information.

Use of lithium-ion batteries



Warning A damaged battery can cause an explosion or fire, and can result in personal injury and/or property damage. To prevent personal injury and/or damage to property, read the important safety information supplied with the battery.

Short-circuiting battery contacts



Warning Do not short-circuit the battery contacts, neither intentionally nor accidentally, e.g. by placing the battery with conductive materials such as keys or jewelry inside a pocket or container. Short-circuiting the battery contacts can heat up the conductive material and cause personal injury and/or damage to property.

Menu maps

This section shows the menus and submenus that may be programmed for your radio. Some features are controlled by software licenses (SFEs) and may not be available with your radio.

Main menu

- Channels**

- Zones**

- Individual call**

- Phone call**

- Dial radio call**

- Services**

 - Messages

 - Status update

 - Status request

 - Call alert

 - Radio check

 - Radio monitor

 - Radio inhibit

 - Radio uninhibit

- Talkgroups**

- Priority call**

- Recent calls**

- Security**

 - Encryption

 - Change all

 - Preset keys

 - Change keyset

 - OTAR

 - Rekey request

 - Advanced

 - Zeroize key

 - Zeroize all

 - Demo key

- Trunking**

 - Site lock

 - Dynamic regrouping

 - Band scan

 - Repeater

 - Hunt force

 - Hunt toggle

 - Repeater toggle

- Emergency**

 - Acknowledge

 - Last stored

- Radio settings**

 - See detailed menus on the following page.*

- Location Svs**

 - Own Location

 - Team locations

 - Recent contacts

 - Send logs

 - Send on PTT

- Diagnostics**

Radio settings

Functions

- Low power tx
- Monitor
- Lock radio
- Set scan key
- Squelch override
- Scanning

Call Settings

- Ignore 2-tone
- Call queuing

Extra features

- Loneworker

Alert settings

- Indicator level
- Keypress tones
- Quiet operation
- Silent operation

Display settings

- Backlighting
- Contrast adjust
- Talk party ID
- RSSI

Radio info

- Key settings

- Version info

 - Radio FW

 - Radio HW

- Battery info

- Radio ID

- Serial number

- Alias

- P25 IP address

- MDT IP address

Advanced

- Edit groups

1 About this guide

This user's guide provides information about TP9100 portable radios.

The radio behavior described in this guide applies to radios with firmware version 8.03. To check the radio's firmware version, see "[Viewing radio information](#)" on page 144. If your radio does not operate as you expect, contact your radio provider for assistance.

Safety warnings used in this guide

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



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



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

Notice This alert is used to highlight information that is required to ensure procedures are performed correctly. Incorrectly performed procedures could result in equipment damage or malfunction.



This icon is used to draw your attention to information that may improve your understanding of the equipment or procedure.

Related documentation

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

- *Safety and Compliance Information*—supplied with each radio. (The same information is included in this user's guide.)
- *Li-ion Battery Safety Information*—supplied with each Li-ion battery.
- *Battery Care and Charging Guide*—supplied with each charger. (The same information is in the section "[Charging and caring for batteries](#)" on [page 129](#).)
- *Vehicle Charger Installation and User's Guide*—covers installing and using the TPA-CH-1xx vehicle charger.

2 Before using your radio

Once you have unpacked your radio, there are a few tasks you must do before you can use it. The most important of these is to charge your battery for the first time—allow 2.5 hours for this.



Warning Use only a Tait-supplied, IS-approved battery, charger, antenna, audio accessory, carry accessory or programming adapter with an IS radio. Fitting a battery or accessory that is not IS-approved, using a charger that is not IS-approved, or failing to use the IS programming adapter, creates a risk of explosion which could cause serious injury or death. For an up-to-date list of approved accessories, contact your regional Tait office. For detailed information about IS radios and how to identify them, see ["Intrinsically Safe radios" on page 16](#).



Warning Do not charge the battery or change the antenna in a hazardous location. An explosion could cause serious injury or death.

This section covers:

- [For your safety—battery warning](#)
- [Attaching labels to the radio or battery](#)
- [Charging the battery before first use](#)
- [Attaching the battery](#)
- [Removing the battery](#)
- [Attaching the antenna](#)
- [Removing the antenna](#)
- [Attaching a belt clip](#)
- [Removing a belt clip](#)
- [Installing an audio accessory](#)
- [Installing an RF speaker microphone](#)

For your safety—battery warning

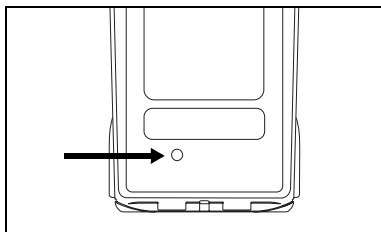


Warning This radio may use a Lithium-ion battery. If the battery is damaged or handled in an unsafe manner, it can cause personal injury and/or damage to property. Read the important safety information included with your battery.

Attaching labels to the radio or battery



Warning Do not cover the battery vent hole. If the vent on the battery is obstructed, the battery may explode, causing personal injury and/or damage to property.



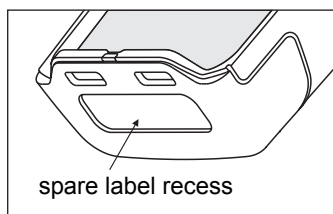
Notice Tait recommends that you do not affix additional labels to the surfaces between the radio chassis and the battery. The fit between these surfaces is intentionally firm and any added thickness will damage the points of attachment between radio and battery.

If a customer requires a customized label, use only a thin gummed paper label with a maximum thickness of 1/32 inch (0.1mm). Attach the customized label in the spare label recess in the chassis (if available), or over an existing label. The customized label may be applied to the bottom 25% of the radio chassis label and/or to the top 25% of the battery label.

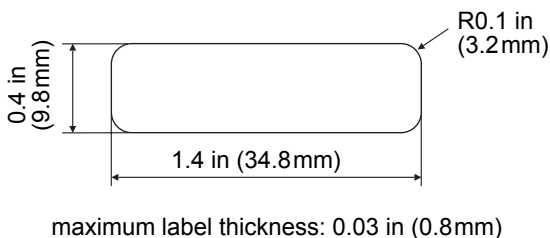
Do not obstruct the battery vent hole (see Warning above). Do not allow the paper label to extend beyond the recessed label area or to conceal relevant product information.

Attaching a label to the front panel

If a customer requires an additional label, attach the label in the spare label recess in the bottom edge of the radio front panel. In this position, the label is still visible while the battery is attached to the radio.



The diagram below shows the specified dimensions of the label.



Charging the battery before first use

The way you charge your battery for the first time depends on the battery chemistry. Allow 14 hours for a nickel metal hydride (NiMH) battery, and 2.5 hours for a lithium-ion (Li-ion) battery.

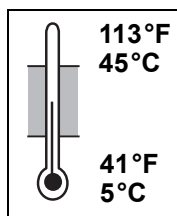
See ["Charging and caring for batteries" on page 129](#) for detailed instructions on how to charge your battery.


NiMH batteries

Fully charge ('prime') a new NiMH battery before using it for the first time. Priming takes up to 14 hours and is most effective if completed without interruption.

Priming takes place between 41°F and 113°F (5°C and 45°C).


Notice Tait recommends that you use a desktop charger or multicharger, not the vehicle charger, to prime a battery.



 The red (middle) LED flashes while the battery is priming. If possible, do not interrupt charging until the green LED is lit.

Li-ion batteries

Fully charge a Li-ion battery before using it for the first time. This will take up to 2.5 hours. It is not necessary to prime a Li-ion battery.

 The red (middle) LED stays lit while the battery charges.

Attaching the battery



Warning Use only a Tait-supplied, IS-approved battery with an IS radio.

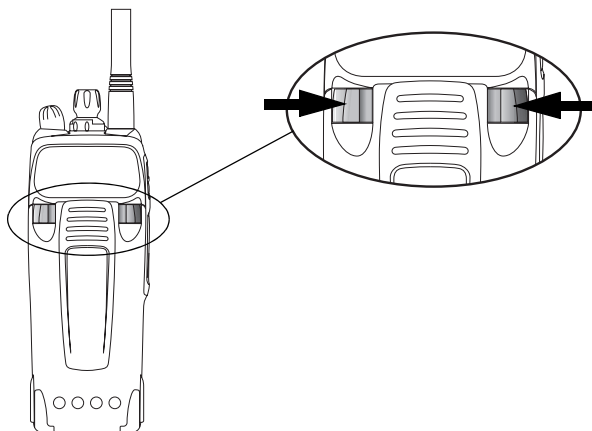
- 1 Insert the lugs at the bottom of the battery into the holes at the bottom of the radio.
- 2 Push the top of the battery towards the radio, and snap it into place.

Removing the battery

The battery is secured to the radio by a battery catch in the radio's rear panel.

To remove the battery from the radio, so that the battery can be charged or replaced:

- 1 Squeeze and quickly release both battery catches to release the catch mechanism.



- 2 Tilt the top of the battery outwards, and lift the lugs at the bottom of the battery out of the holes at the bottom of the radio.

Attaching the antenna

Before using the radio, screw the antenna clockwise into the antenna connector. The antenna should be screwed sufficiently tight so that it doesn't unscrew easily. This is important as it creates a seal.

Removing the antenna



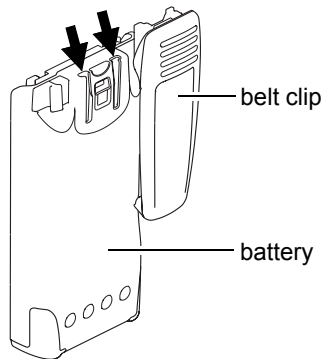
Warning Do not change the antenna in a hazardous location. An explosion could cause serious injury or death.

Use a firm grip and turn the antenna counterclockwise half a turn. Use a lighter grip to fully unscrew the antenna, and carefully remove it.

Attaching a belt clip

To attach a belt clip to the radio:

- 1 Slide the belt clip into the two grooves at the top of the battery.



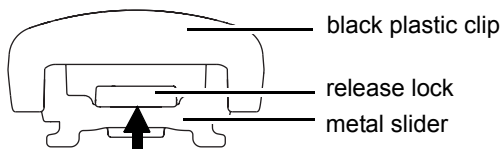
- 2 Press down on the belt clip until it snaps into place.

Removing a belt clip

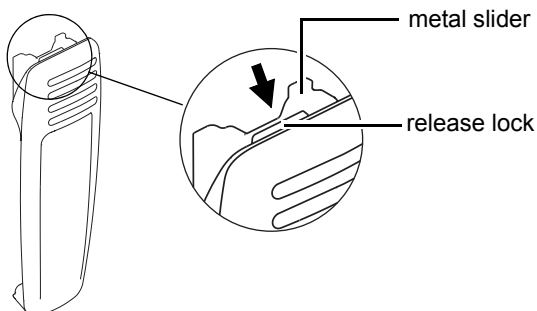
The belt clip has been designed to prevent accidental removal, but you can take it off, if required.

To remove a belt clip from a battery:

- 1 Insert a flat screwdriver blade or similar flat object under the lip of the release lock (that is, between it and the metal slider).



- 2 Lift the release lock up (away from the metal slider) and hold it in position.



- 3 Slide the belt clip out.

Installing an audio accessory



Warning Use only Tait-supplied, IS-approved audio accessories with IS radios. Fitting an audio accessory that is not IS-approved exposes the customer to a risk of explosion which could cause serious injury or death. For an up-to-date list of approved audio accessories, contact your regional Tait office. For detailed information about IS radios and how to identify them, see ["Intrinsically Safe radios" on page 16](#).

Audio accessories plug into the radio's accessory connector. The accessory connector is protected by a cover, which needs to be removed before an accessory can be installed.

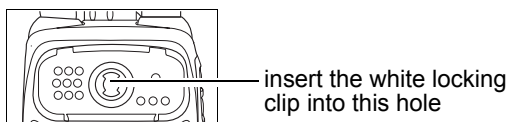
Notice The accessory cover protects the accessory connector from electrostatic discharge. Keep the cover in place unless the connector is in use.

To remove the accessory cover and install an audio accessory:

- 1 Insert a coin, or other suitably shaped object, into the slot of the protective cover. Twist the coin clockwise from the locked to unlocked position.
- 2 Remove the accessory cover and store it in a safe place.
- 3 Push and hold the metal clip to release the lever.



- 4 Rotate the lever clockwise to an upright position.
- 5 Insert the white locking clip into the matching hole at the rear of the radio.



- 6 Rotate the lever counterclockwise until you hear it click.
- 7 Check that the accessory connector is firmly locked into place.

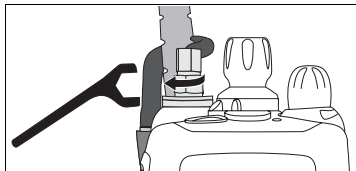
Installing an RF speaker microphone

Once you have attached the accessory connector to the radio, you can attach the coax cable of the RF speaker microphone to the radio's antenna connector and then screw the radio's antenna onto the speaker microphone.

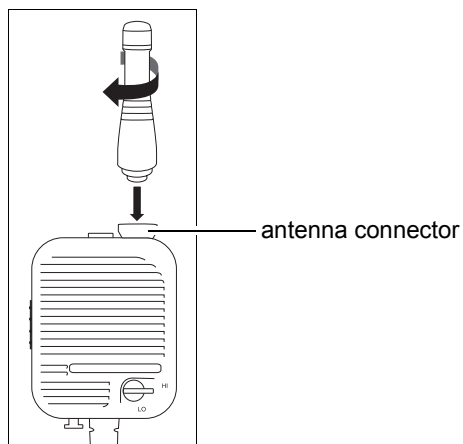
- 1 Remove the antenna from the radio.
- 2 Place the brass RF coaxial connector onto the radio's antenna connector.



- 3 Tighten the connector with the 5/16 inch spanner, until it sits deep in the radio housing.



- 4 On the speaker microphone, screw the antenna clockwise into the antenna connector.



3 Getting started

This section gives an overview of your P25 radio, describes the radio's controls and indicators, and explains how the radio menus are organized.

This section covers:

- [About P25 digital radios](#)
- [About the radio controls](#)
- [Understanding the radio display](#)
- [Understanding the radio indicators](#)
- [Using function keys to access frequently used features](#)
- [Navigating the radio's menus](#)

About P25 digital radios

Your P25 digital radio can be programmed for P25 conventional or P25 trunked operation. Analog conventional operation is also available, with dual-mode channels able to transmit and receive both digital and analog calls.

You may notice differences between digital and analog calls in terms of:

- static noise in low signal areas, and
- radio coverage in marginal reception areas.

Lack of static noise

On digital networks there is no static noise, even in low signal areas. This lack of static is because your digital radio removes the 'noise' from the call, so that you hear only clear voice.

Coverage

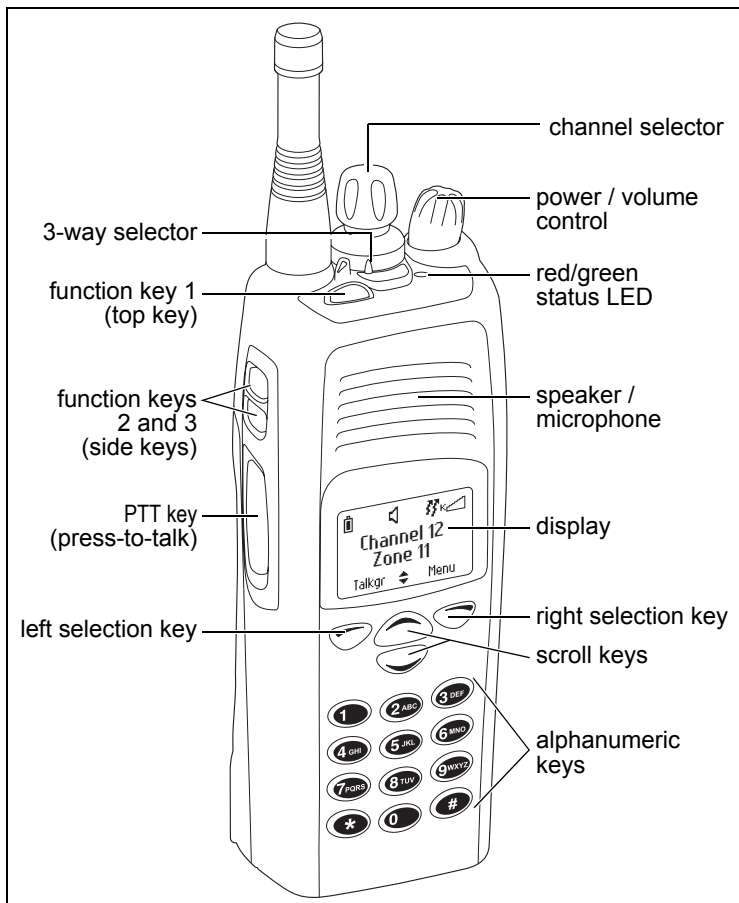
With digital networks, a call remains clear and then drops off quickly at the border of a coverage area. The reason for this is that a digital call is either received or it isn't. With analog networks, the background noise in a call gets progressively worse when you are in fringe areas or even slightly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

About the radio controls

The radio controls are the PTT key, power/volume control, channel selector, 3-way selector control (optional), 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.



















Name	Function
PTT key	Press and hold to transmit and release to listen
Power/volume control	Rotate to turn the radio on and change the speaker volume
Channel selector	Select and change channels
3-way selector (optional)	Select frequently used features
Left and right selection keys	Action determined by the text above the selection key
Scroll keys	Scroll up and down through a list of menu options, scroll left and right in messages, or select the Quick Access menu
Function keys	Programmed for frequently used options
Alphanumeric keys	Used to enter letters and numbers

Understanding the radio display

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

Radio display icons


These are some of the icons you may see on your radio display:

Icon	Meaning
	Signal strength indicator: the more bars, the stronger the signal being received by your radio
	Zone: this letter represents the zone in which your radio is operating, where A is zone 1, Z is zone 26 and AD is zone 30 (in the example shown, K represents zone 11)
	Trunking system available: your radio is operating on a P25 trunking system
	Transmit: your radio is transmitting
	Low-power transmit: your radio is set to transmit on low power
	Repeater talkaround: your radio is operating in repeater talkaround mode, or you are on a simplex channel
	Silent operation: your radio's audible tones have been turned off
	Encryption: your radio's transmissions are encrypted
	Scanning: your radio is monitoring a group of channels or talkgroups for activity
	Scanning: your radio is monitoring a group of channels or talkgroups for activity, and the currently selected channel or talkgroup is a member of the scan group.
	Monitor or squelch override: monitor or squelch override is active
	Battery indicator: shows how much charge is available in the battery
	Battery in charger: appears when you place a radio (with a battery attached) in the charger
	Scrolling: you can use  or  to move through a list, or access a Quick Reference menu

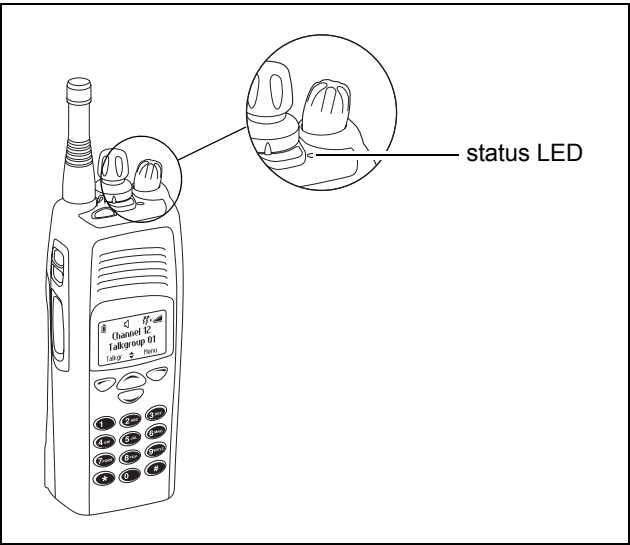
Understanding the radio indicators





The status LED indicator 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.

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

Status indicators



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 or monitor is active

Audible tones

The radio uses audible tones 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.
- Incoming call tone—when the radio is receiving a call.
- Warning tones—when there is an error, or the battery is low, for example.



Warning If quiet or silent mode is turned on, you will not hear any alert tones.

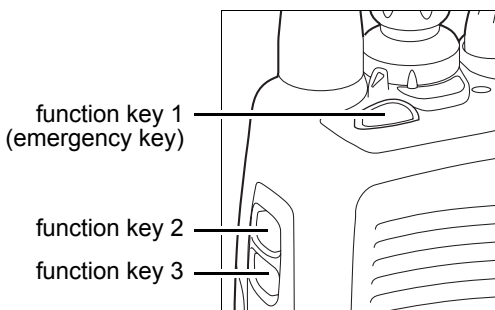
Some of the more common audible tones are described below:

Tone	Meaning
One short beep	<ul style="list-style-type: none">■ Valid keypress: The action you have attempted is permitted.■ Function activated: A function has been turned on (using either the Main menu or a function key).
One short, low-pitched beep	Function deactivated: A function has been turned off (using either the Main menu or a function key).
One long, low-pitched beep	<ul style="list-style-type: none">■ 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
Two short beeps	<ul style="list-style-type: none">■ 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.
One short, high-pitched beep	Radio is stunned: The radio has been made inoperable by your service provider.

Tone	Meaning
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: The radio's temperature is in the very high temperature range and 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.
Continuous low-pitched tone	Radio system error: A system error has occurred and the radio may be inoperable. Contact your radio provider.
Two long high-low pitched tone pairs	Synthesizer is out-of-lock: The radio's synthesizer is out-of-lock on the current channel and you cannot operate on that channel (Out of Lock appears on the display).

Using function keys to access frequently used features

The function keys provide access to some of the features you will use most often. These features are assigned to the function keys when the radio is programmed. Some keys may have a feature associated with both a short key press and a long key press.



Viewing the function key settings

Use the Main menu to check the features assigned to your radio's function keys:

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

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



- 4 Press **Back** to return to the Key Settings menu.

Use the following table to record the function keys programmed for your radio:

	Short key press	Long key press
F1		
F2		
F3		
F4		
F5 ¹		
F6 ¹		

1. On speaker microphone (if fitted)

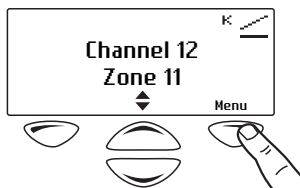
For more information about the function keys that can be programmed on your radio, contact your radio provider.

Navigating the radio's menus

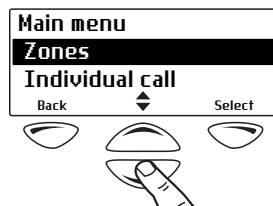
Your radio has a number of menus, each containing lists or submenus. The menus available depend on the way your radio is programmed.

Using the Main menu


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



Use the scroll keys to move through the menu list.



When the menu you want is highlighted, press **Select** to open the menu you have chosen.

-  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

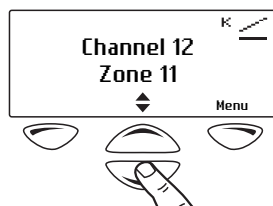
Depending on how your radio is programmed, you may have two different Quick Access menus. One Quick Access menu is displayed when you press a scroll key, and the other when you press the left selection key. These give you easy access to the menus you use most often.

Using the scroll key Quick Access menu

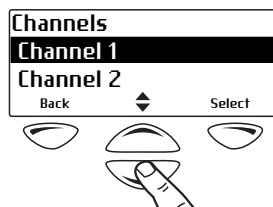
There are two ways to use this Quick Access menu:

- Use the scroll keys to scroll through a list of zones or channels.
- Press the scroll keys and the Quick Access menu appears.

In this example, the **Channels** menu is the Quick Access menu. Use the scroll keys to go directly to the **Channels** menu.



The **Channels** menu, with a list of your available channels, is now displayed.

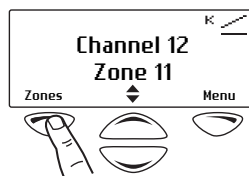


Using the left selection key Quick Access menu

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

To use this Quick Access menu:

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



4 Basic operation

This section describes the basic operation of your radio.


This section covers:

- Turning the radio on and off
- Adjusting the speaker volume
- Locking and unlocking the keypad
- Selecting a zone
- Selecting a channel
- Limiting call time
- Checking recent calls

Turning the radio on and off

Rotate the power/volume control switch clockwise to turn the radio on. Rotate the switch counterclockwise to turn the radio off.


When the radio is first turned on, the status LED briefly glows red, and the radio gives two short beeps.

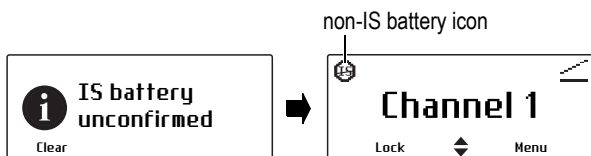
 Your radio may not turn on if your battery is very low. (See ["Low battery warning" on page 134.](#))

Non-IS battery alert



Warning Fit only an IS-approved battery to your IS radio. Fitting a battery or accessory that is not IS-approved exposes the customer to a risk of explosion which could cause serious injury or death.

If you have inadvertently connected a non-IS battery to your radio, the message **IS battery unconfirmed** appears in the display, and the battery icon periodically flashes .



For information about identifying IS batteries, see ["Intrinsically Safe radios" on page 16](#). If the battery appears to be an IS battery, and the alert persists, see ["IS battery unconfirmed' alert" on page 143](#) for more information.

Using 'protective power-down'

If your radio is programmed with the 'protective power-down' feature, you also need to press either function key 2 (side key 1) or function key 3 (side key 2) in order to turn off the radio. This prevents you inadvertently turning off the radio when adjusting the volume to a low level.

To turn the radio off:

- Rotate the power/volume control switch fully counterclockwise.
- Short press either function key 2 or 3 (side key 1 or 2).

Security lock on power-up feature

Your radio may be automatically locked each time it is powered-up. If the message **Enter PIN** appears in the display, enter your assigned PIN (personal identification number). See [“Unlocking the radio”](#) below.

Locking 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 current setting is highlighted.)

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

Unlocking the radio

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

Adjusting the speaker volume

Rotate the power/volume control clockwise to increase the speaker volume and counterclockwise to decrease the volume.



The volume control also changes the volume level of the radio's audible indicators.

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.

To lock the keypad:

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

(Depending on your radio model and the way it is programmed, you may be able to use the left selection key, or your radio may have a 3-way selector that can be used to lock the keypad.)

The message **Keypad locked** briefly appears in the display, and **Unlock** appears above the right selection key, in place of **Menu**.

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

To unlock the keypad:

- Depending on the programming, press and hold the right or left selection key for about one second.

Selecting a zone

Your radio may be programmed to use zones. 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.).

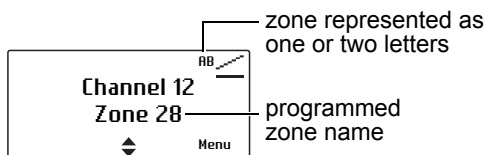
To select a zone:

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

3 Press **Select**.

Your radio may indicate the zone in which it is currently operating in the following ways:

- the name of the zone appears below the channel name in the default radio display, or
- the zone icon appears as a letter in the top right corner of the display.



Other ways of selecting a zone

You may also be able to use the following controls to select a zone:

- 3-way selector (see ["About the radio controls" on page 37](#))
- left selection key (see ["Using the left selection key Quick Access menu" on page 45](#))
- scroll keys (see ["Using the scroll key Quick Access menu" on page 45](#))
- function keys to scroll through zones

Selecting a channel

Using the channel selector

For channels 1 to 16, rotate the channel selector to the channel you want. For all other channels, use the Main menu to select a channel.

Using the Main menu

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

Using the keypad

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

To delete a digit that you have dialed incorrectly, press **Clear**.

- 2 Press **Select** or **#** to confirm the channel change.

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

Other ways of selecting a channel

You may also be able to use the following controls to select a channel:

- function key (see ["Accessing frequently used menus" on page 44](#))
- left selection key (see ["Using the left selection key Quick Access menu" on page 45](#))
- scroll keys (see ["Using the scroll key Quick Access menu" on page 45](#))

Limiting call time

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

The message **Transmit Timeout Imminent** appears in the display.

Checking recent calls

This feature is available for digital channels only and applies to individual calls and call alert pages only.

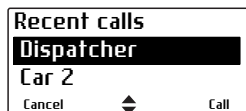
Your radio may be able to store a list of the last 20 calls. These calls may be calls that you have received, calls that you have made, or calls that you have missed.

To use your recent calls list to make a call:

- 1 Press **Menu** and select **Recent calls**. (Depending on how your radio is programmed, you may be able to press a function key or use your Quick Access menu to 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 in the display.

- 2 Scroll through the list of recent calls until the call you want appears, and then press **Call**.



The message **Call...?** briefly appears in the screen.

Press the PTT key to make the call.

- 3 Alternatively, scroll through the list of recent calls until the call you want appears, and press the PTT to make the call immediately.

5

Operating in conventional mode

This section explains how to operate your radio in conventional mode. This includes how to make and receive calls, and use your radio in different repeater areas.

This section covers:

- Making a call
- Making an individual call
- Understanding talkgroups
- Making an emergency call
- Receiving calls
- Communicating directly with other radios
- Checking that the channel is clear
- Using the radio in different repeater areas
- Hearing faint and noisy signals


Making a call

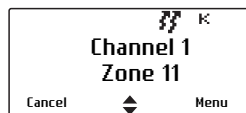
To make a call:

- 1 Select the required zone (see ["Selecting a zone" on page 49](#)).
- 2 Select the required channel (see ["Selecting a channel" on page 50](#)).
- 3 Hold the radio so that the microphone is about one inch (2.5 cm) from your mouth and press the PTT key to transmit.

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

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

While you are transmitting the LED glows red and  appears on the display.



- 5 Finish your conversation as soon as possible and release the PTT key. For a short time, your radio may prevent you from making another call.

Making an individual call

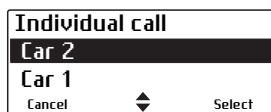
This feature is available for digital channels only.

To make a call to one person rather than a group of people:

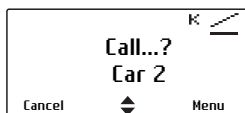
- 1 Press **Menu** and select **Individual call**.
(The person to whom you last made an individual call is highlighted.)

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

- 2 Scroll to the person you want to call and press the PTT key to make the call immediately.
- 3 Alternatively, scroll to the person you want to call and press **Select**.



The message **Call...?** briefly appears on the display.



- 4 Press the PTT key to make the call.

Understanding talkgroups

This feature is available for digital channels only.

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 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

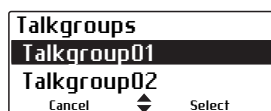
- Press the PTT key.

Changing a talkgroup

- 1 Press **Menu** and select **Talkgroups**.

(Depending on how your radio is programmed, you may be able to use a Quick Access menu to go to the Talkgroup menu.)

- 2 Scroll through the list of talkgroups to the one you want and press **Select**.



- 3 Press the PTT key to make a call to the currently selected talkgroup.

Making an emergency call

For information about making and ending emergency calls together with a explanation of how your radio behaves in emergency mode, see ["About emergency calls" on page 105](#) and ["Standard emergency mode" on page 107](#).

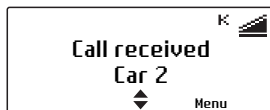
Receiving calls

When a call is received with valid signaling, the radio unmutes and you can hear the call.

Identifying the talking party

Your radio may be programmed to display the name or radio ID of the talking party.

If the name of the talking party is in the call list, the radio will display the name of the talking party. If this name is not in the call list, only the radio ID is shown.



Talkgroup calls will first display the name of the talkgroup. While a party is talking, the radio will also display the name or radio ID of the talking party.



Turning caller ID on and off

Your radio may be programmed to allow you to turn the talking party ID on and off.

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

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

Receiving a two-tone call

This feature is available for analog channels only.

Two-tone signaling is used to call either individual or groups of radios. When your radio receives a two-tone call that it can decode, it beeps, indicating which type of two-tone call has been received.

- One long beep: a two-tone individual call has been received.
- Two medium beeps: a two-tone group call has been received.
- Three short beeps: a two-tone super group call has been received. A super-group call is addressed to all radios in the fleet.

Press the PTT key and begin speaking.

Overriding two-tone signaling

You can override two-tone signaling using a function key, if your radio is programmed in this way.

- Press the function key to override two-tone signaling on a channel, and hear all two-tone calls.

The message **Ignore two-tone activated** (or **deactivated**) appears on the display.

Communicating directly with other radios


You can bypass the radio repeater and communicate directly with another radio using the radio talkaround feature. You can do this when you are out of range of the repeater, or if the repeater is busy.

While repeater talkaround is active, all calls are made on your current channel's receive frequency.

Turning repeater talkaround on and off

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.

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

Repeater talkaround remains on until you press the function key again.

Checking that the channel is clear

Monitor allows you to override some or all of the radio's mutes, allowing 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 the channel is clear before you make a call.

Turning monitor on and off

- 1 Press **Menu** and select **Radio settings > Functions > Monitor**.

(Depending on how your radio is programmed, you may be able to press a function key to toggle monitor on and off.)

- 2 Scroll to **On** (or **Off**) and press **Select**.

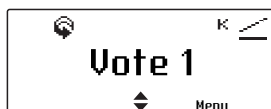
While monitor is active,  appears in the display.

Using the radio in different repeater areas

Your 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 your radio moves in and out of different repeater coverage areas, the best communication channel is automatically selected for you to use.

This channel is known as the 'home' channel, and may be the channel you make and receive calls on.

While voting is active,  appears on the display.



Selecting a voting group

Using the channel selector

You can use the channel selector to select a preset voting group, if your radio is programmed in this way.

- Rotate the channel selector to the group you want.

Using a function key

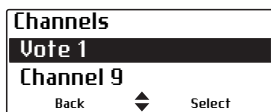
To use a function key to select a voting group:

- Press the function key to select and activate a preset voting or scan 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**.



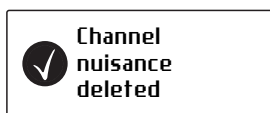
Suspending a channel from a voting group

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

To remove a channel from a voting group:

- 1 Wait until the radio has stopped on the channel that you want to remove from the voting group.
- 2 Press the function key programmed for nuisance delete.

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



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

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

Hearing faint and noisy signals

This feature is only applicable to analog channels.

Usually the radio's squelch mute (known as 'squelch') prevents you from hearing faint or noisy calls on a channel. Without squelch, the radio's speaker would 'chatter' in low signal strength areas.

On occasions when you want to hear everything that is being said on a channel, even if it is hard to understand, you can use the squelch override feature to force the mute open.

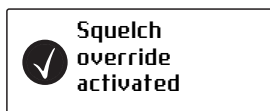
Turning squelch override on and off

- 1 Press **Menu** and select **Radio settings > Functions > Squelch override**.

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

- 2 Scroll to **On** (or **Off**) and press **Select**.

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



6 Operating in P25 trunking mode

This section explains how your radio operates on a P25 trunking system. This includes how to make group calls, individual calls and phone calls.



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

The features described in this chapter are only available for radios configured for P25 trunking operation.

This section covers:

- [About P25 trunking](#)
- [Checking that the system is available](#)
- [Making a talkgroup call](#)
- [Receiving a talkgroup call](#)
- [Making an individual call](#)
- [Receiving an individual call](#)
- [Emergency calls](#)
- [Making a phone call](#)
- [Unconnected calls](#)
- [Failsoft mode operation](#)
- [Dynamic regrouping](#)

About P25 trunking

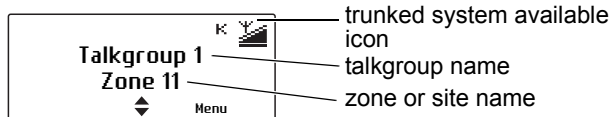
Your radio may be able to operate on a P25 trunking system as well as a conventional repeater-based system. On a conventional system, radio users compete for access to individual channels, and one channel can be overloaded with traffic while others are often unused.

The trunking system allows several channels to be automatically shared by a number of radio users. These traffic channels are pooled and allocated, as required, for the duration of a call. As calls are completed, the traffic channels are returned to the pool, to be used for other calls. This system means reduced waiting times to make calls.

Checking that the system is available

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

If registration is successful, the trunking system available icon 'Y' appears in the display.




Registration is unsuccessful

If registration is not successful, 'Y' 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.

Service is lost

If access to the trunking system is lost, 'K' no longer appears, the bars in the RSSI icon disappear , and the display shows **No service**.

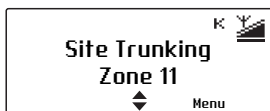


The radio sounds five beeps to indicate the loss of service, followed by a repeating double beep. The double beep continues until service is restored.

Site trunking operation

During normal trunking operation, your 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 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, your radio automatically returns to normal multi-site operation.

Failsoft operation

Your radio may be programmed to enter 'failsoft' mode when service is lost due to failure of a trunking site controller. For information about failsoft mode, see ["Failsoft mode operation" on page 72](#).

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



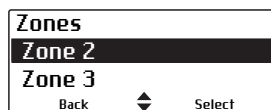
Caution In some situations, your call will not proceed. For an explanation of the radio behavior, see ["Unconnected calls" on page 71](#).

To make a talkgroup call on a trunking system:

1 Select the required zone:

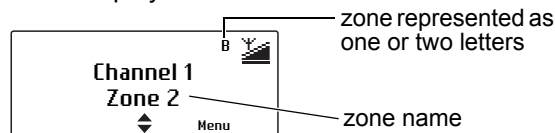
■ Press **Menu** and select **Zones**.

■ Scroll to the zone you want, and press **Select**.



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

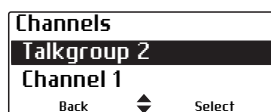
Your radio now indicates the zone in which it is operating, either as a letter in the top right corner of the display, or as a zone name in the second line of the display.



2 Select the required talkgroup:

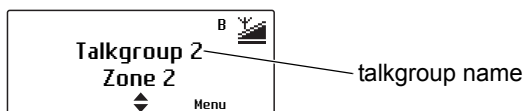
■ Press **Menu** and select **Channels**.

- Scroll to the talkgroup you want, and press **Select**.




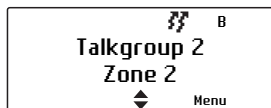
(Depending on how your radio is programmed, you may be able to press a function key, use your Quick Access menu or use the channel selector to select a talkgroup.)

Your radio now indicates the currently selected talkgroup.



- 3 To call this talkgroup, hold the radio so that the microphone is about one inch (2.5 cm) from your mouth.
- 4 Press and hold the PTT key to transmit.
- 5 When you hear three short beeps, speak clearly into the microphone and release the PTT key when you have finished talking.

While you are transmitting, the LED glows red and  appears in the display.

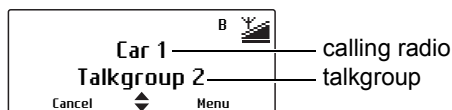


Receiving a talkgroup call

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

For information about selecting a talkgroup, see ["Making a talkgroup call" on page 66](#), and for information about talkgroup scanning, see ["Activating talkgroup scanning" on page 79](#).

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.



Making an individual call



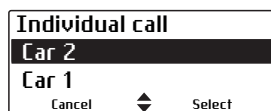
Caution In some situations, your call will not proceed. For an explanation of the radio behavior, see ["Unconnected calls" on page 71](#).

To make a call to one radio on a trunking system:

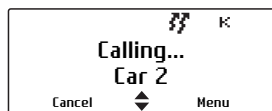
- 1 Press **Menu** and select **Individual call**.
(The person to whom you last made an individual call is highlighted.)

Depending on your radio model and how it is programmed, you may be able to dial the identity of the radio you want to call, press a function key or use your Quick Access menu to select an individual call.

- 2 Scroll to the person you want to call and press **Select** or press the PTT key.



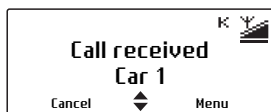
The message **Calling...** briefly appears.



- 3 When the called party accepts the call, you will hear three short beeps.
- 4 Once the called party has finished talking, press and hold the PTT key to transmit, speak clearly into the microphone, and release the PTT key when you have finished talking.

Receiving an individual call

When you receive a call from an individual radio, your 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.

Emergency calls

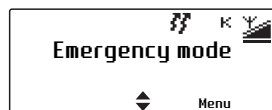
In an emergency, you can summon help by sending an emergency call. When an emergency call is initiated, the radio enters 'emergency mode'. For more information on emergency mode, see ["Standard emergency mode" on page 107](#).

Making an emergency call

You can make an emergency call using the emergency function key (function key 1).

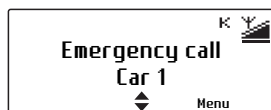
- Press the function or emergency key to activate emergency mode.

The message **Emergency mode** appears and the radio sounds three short beeps, rising in pitch.



Receiving an emergency call

When you receive an emergency call, your radio displays the caller's name or identity and sounds a long beep.



Making a phone call

This feature is only available for radios with alphanumeric keys.

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



Caution In some situations, your call will not proceed. For an explanation of the radio behavior, see ["Unconnected calls" on page 71](#).

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.)
(Depending on how your radio is programmed, you may be able to press a function key or use your Quick Access menu to open the Phone Call menu.)
- 2 Scroll to the number or person you want to call, or dial the required number using the alphanumeric keys.



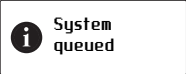
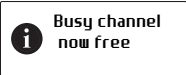


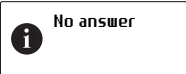
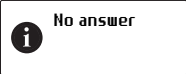
- 3 Press **Select** or the PTT key.

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** left selection key.

Unconnected calls


If your call is not connected, the way your radio behaves is explained in the following table.

Radio behavior	Explanation
	The system is too busy to process your talkgroup or individual call.
	The system is now available to process your talkgroup or individual call.
The radio sounds three short beeps.	
	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 "Service is lost" on page 65 .
The radio sounds five beeps, followed by a repeating double beep.	
	You have attempted to make an individual call to a radio that does not currently exist on the system.
The radio sounds two short beeps.	You have attempted to make an individual or phone call, but you are not authorized to do this.
	Your individual or phone call has been rejected or is unanswered.
The radio sounds two short beeps.	

Failsoft mode operation

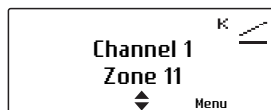
If your radio is unable to access the trunking system, it may be programmed to enter failsoft mode. Failsoft mode operates in one of two ways: 'radio-based' failsoft and 'infrastructure' failsoft.

Radio-based failsoft

When you lose access to the trunking system, 'T' no longer appears, the bars in the RSSI icon disappear , and the display shows **No service**.



After a short time, your radio switches to a programmed conventional communications channel.



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

Infrastructure failsoft

Your radio receives a message from the trunking infrastructure to say 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 your radio is programmed.

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

Dynamic regrouping

The dynamic regrouping feature allows you to send a dynamic regrouping request to your dispatcher. Your dispatcher can then reassign your radio to a special communications group.

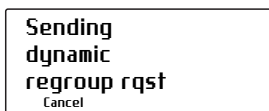


Caution While you are operating on this group, normal channel selection may be disabled.

To send a dynamic regrouping request:

- Press **Menu** and select **Trunking > Dyn Regrouping**.

When you press **Select**, a message appears in the display.



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



7 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.

This section covers:


- [About scanning](#)
- [Activating standard scanning](#)
- [Activating background scanning](#)
- [Activating in-zone scanning](#)
- [Activating talkgroup scanning](#)
- [Making a call while scanning](#)
- [Suspending a channel from a scan group](#)
- [Editing a scan group](#)

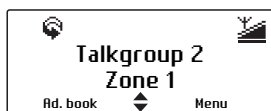
About scanning


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.


Members of a scan group may be conventional channels (P25 or analog), trunked talkgroups, and vote groups, depending of the type of scan group. 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 than 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 animated  icon appears on the display.



When the radio stops on a channel or talkgroup where there is activity, 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 (P25 conventional and analog channels)

- background scanning (P25 conventional and analog channels, and may include some voting groups)
- in-zone scanning (P25 conventional and analog channels, and P25 trunked talkgroups)
- talkgroup scanning (P25 trunked talkgroups, and may include some P25 conventional and analog channels,).



For information about viewing and editing scan group membership, see ["Editing a scan group" on page 81](#).

Activating standard scanning

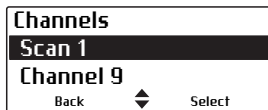
A standard scan group scans conventional channels (P25 and analog) from across zones, and can also scan one or two voting groups. A standard scan group appears and behaves on the radio like a separate channel, and all standard scan groups are included in the channel list. Standard scanning is activated when you select a standard scan group.

To select a standard scan group:

- 1 Press **Menu** and select **Channels**.

(Depending on how your radio is programmed, you may be able to press a function key or use the channel selector or Quick Access menu to select channels.)

- 2 Scroll to the group you want and press **Select**.



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 (P25 or analog) 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**, or press the function key programmed for background scanning.

Background scanning remains on until you either press the function key again, or select a standard, in-zone or talkgroup scan group.

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.

Activating in-zone scanning

An in-zone scan group scans the first 50 conventional channels (P25 or analog) 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, and zones are used to separate different geographic regions or work roles. 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**, or press the function key programmed for in-zone scanning.

In-zone scanning remains on until you either press the function key again, or select a standard, background or talkgroup scan group.

Activating talkgroup scanning

Talkgroup scanning monitors calls from multiple trunked talkgroups, and up to five additional conventional channels (P25 or analog), 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.



Warning 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 even 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**, or press the function key programmed for talkgroup scanning.


Talkgroup scanning remains on until you either press the function key again, or select a standard, background or in-zone scan group.

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 is flashing, your radio calls the currently selected channel.

If there has been no recent activity on the channel (the  icon is 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.

- 2 When the called party responds, proceed with your conversation.

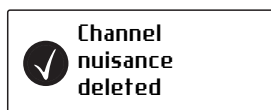
Suspending a channel from a scan group


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 in 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.

Editing a scan group

Selecting a group to edit

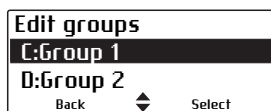
- 1 Press **Menu** and select **Radio settings** > **Functions** > **Advanced** > **Edit groups**.



(Depending on how your radio is programmed, you may be able to press a function key or use your Quick Access menu to select the Edit Groups menu.)

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.

Icons and messages

The following icons may appear when viewing group membership details, adding or deleting channels from a group, or changing a group's transmit or priority channels.

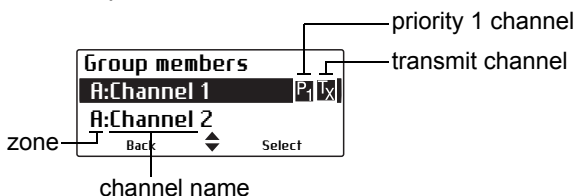
Icon	Meaning
T_x	This channel is used to transmit on when there has been no recent activity. You cannot delete this channel (it will not appear under Delete channel).
P_1	This channel is the group's first priority channel. You cannot delete this channel (it will not appear under Delete channel).
P_2	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.

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.
- 4 The information that may appear is explained in the example below.

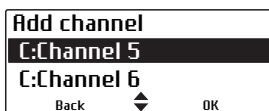


Adding a channel to a group

- 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**.





For all types of scanning except standard scanning, if your radio is programmed to use the scroll keys to scroll through a list of channels and also has a function key programmed to Nuisance Delete, you can **permanently** add or delete a channel to the active group by scrolling to the channel and pressing the **Nuisance Delete** function key.

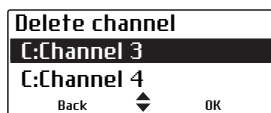
Deleting a channel from a group

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** and 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**.



For all types of scanning except standard scanning, if your radio is programmed to use the scroll keys to scroll through a list of channels and also has a function key programmed to Nuisance Delete, you can **permanently** add or delete a channel to the active group by scrolling to the channel and pressing the Nuisance Delete function key.

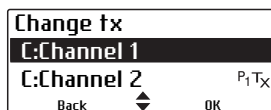
Changing a group's transmit channel



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

- 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 T_x icon beside the channel name.



- 3 Select the new transmit channel and press **OK**.

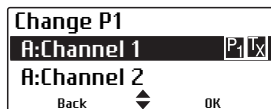


The transmit channel remains changed even after the radio is turned off.

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**.

8 P25 services

This section describes the P25 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.

This section covers:

- Messages
- Status update
- Status request
- Call alert
- Radio check
- Radio unit monitor
- Radio inhibit and uninhibit

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

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

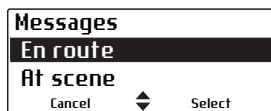
The radio to whom you are sending the message must have the same message programmed in order to read and display your message.

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 Select the message you want from the list.
- 3 Press **Select**.



A message showing the destination appears in the display.

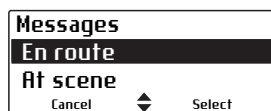


The LED glows red and a message may be displayed to advise you whether the message has been sent successfully or not.

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

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

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 page 90](#).

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

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 Select the status request recipient from the list.
- 3 Press Send to.



A message showing the destination appears in the display.



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



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

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 Select the radio you want to page.
- 3 Press **Send to**.



A message appears in 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 acknowledgement 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 in the display.

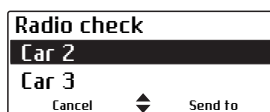
Select **Call** to return the page or **No** to delete it. If you miss the call alert page, the identity of the caller may be saved in your recent calls list.

Radio check

This feature is only available on P25 conventional channels.

If you want to find out whether a particular radio is available on the system, you can use the radio check feature. This sends a radio check message to the radio unit you have specified.

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



The LED glows red and a message showing the destination appears in the display.




If the radio is available on the system, an acknowledgement message is displayed.



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

Radio unit monitor

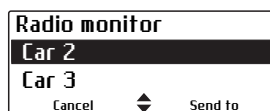
-  This feature is controlled by a software license (SFE) and may not be available with your radio. This software license is only required for the radio that sends the radio unit monitor request. The receiving radio does not need the software license.

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

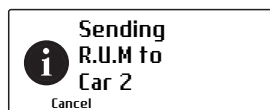
The radio unit monitor feature can be used when you are concerned about the safety of a radio user on your system. When you send a radio-unit monitor request to a radio, it calls you back without giving any indication that it is making a call. You can hear any activity near the radio for up to 20 seconds.

Sending a radio unit monitor request

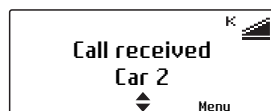
- 1 Press **Menu** and select **Services > Radio monitor**.
- 2 Scroll to the radio you want to monitor.
- 3 Press **Send to**.



The LED glows red and a message appears in the display.



If the other radio has received your request, it will now call you, so that you can monitor activity near the radio.



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

Radio inhibit and uninhibit



Warning When your radio is immobilized ('inhibited'), your encryption keys may be automatically deleted from your radio.

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

If you want to make another radio on the system inoperable, you can use the radio inhibit feature. This feature is also known as 'stun'.

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

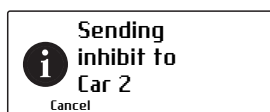
The radio cannot return to operation until it receives an uninhibit request. This is also known as 'revive'.

Sending a radio inhibit request

- 1 Press **Menu** and select **Services > Radio inhibit**.
- 2 Scroll to the radio you wish to make inoperable.
- 3 Press **Send to**.



The LED glows red and a message appears in the display.



If the radio has been successfully immobilized, an acknowledgement message is displayed.

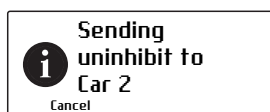


Sending a radio uninhibit request

- 1 Press **Menu** and select **Services > Radio uninhibit**.
- 2 Scroll to the radio you wish to make operable.
- 3 Press Send to.



The LED glows red and a message appears in the display.



If the radio has been successfully returned to operation, an acknowledgement message is displayed.



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

9 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.

This section covers:

- [About location information](#)
- [About location statuses](#)
- [Viewing location information](#)
- [Sending location information](#)
- [Receiving and logging location information](#)
- [Accessing logged location information](#)

About location information

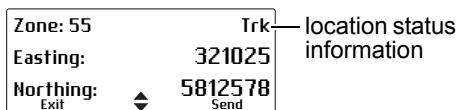
While you may be able to view your location information on analog channels, sending location information is only available for digital channels.

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 or receive and log location information.

About location statuses

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



- **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.
- **no cnx**: the radio has lost serial communications with the receiver.



Your radio configuration may include the **Send** option. This option is a digital feature, and is only available on digital channels.

Viewing location information

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

(Depending on how your radio is programmed, you may be able to press a function key to access the Own location menu.)

Location information is now shown in the display, if it is available.

-  Your radio may be programmed to show any of these displays, in any order.
-  Immediately after the radio is turned on, location reporting is set to all zeros, until the first satellite fix is achieved.

- 2 Use the scroll keys to scroll through the **Own location** displays.

Zone: 59	Trk
Easting: 321025	
Northing: 5812578	
Exit	◆

- Zone: UTM zone number
- Easting and Northing: Raw Universal Transverse Mercator (UTM) Cartesian coordinates

Location	Trk
S 43°29'00.0"	
E 172°33'05.0"	
Exit	◆

- Latitude and longitude in degrees, minutes and decimal seconds

Location	Trk
S 43°29.000"	
E 172°33.083"	
Exit	◆

- Latitude and longitude in degrees, minutes and decimal minutes (to three decimal places)

Location	Trk
S 43.488326°	
E 172.563255°	
Exit	◆

- Latitude and longitude in decimal degrees

Location	Trk
Course: 010°	
Speed: 045 km/h	
Exit	◆

- The radio's current course and speed

Location	Trk
UTC time:	23:36:20
Exit	◆

- UTC: Coordinated Universal Time 24 hour clock

Location	Trk
Altitude:	34m
Exit	◆

- The radio's altitude in metres above or below mean sea level

MGA:	Trk
Zone:	29N
	PJ264837
Exit	◆

- MGA: Map Grid of Australia coordinate system
- Zone: UTM zone number
- PJ: The grid square
- 264837: Easting and Northing to the nearest 100m

MGRS:	Trk
59G PM	
26406 83789	
Exit	◆

- MGRS: Military Grid Reference System
- 59G: UTM zone and band
- PM: The grid square
- 26406 83789: Easting and Northing to the nearest 1 m

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

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

Sending location information



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

To send location information, you can:

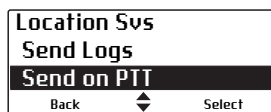
- press the PTT key,
- use a function key, or
- use the radio menu.

Using the PTT key

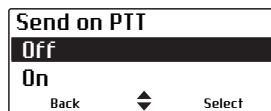
Your radio may be configured to send location information each time you press or release the PTT key. This feature can be turned on or off using the Send On PTT menu, and may be active when the radio is first turned on.

To turn 'Send on PTT' off or on:

- 1 Press **Menu** and select **Location Svs > Send on PTT**.



- 2 Scroll to **Off** (or **On**) and press **Select**. (The current setting is highlighted.)



Using a function key

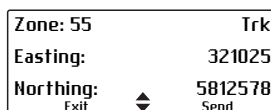
You may be able to use a function key to manually send your location to either all radios on the channel, or to your dispatcher (depending on how your radio is programmed).

- 1 Press the function key programmed for **Own Location**.

(Alternatively, press **Menu** and select **Location Svs > Own location**.)

The current location of the radio appears on the display.


- 2 Press **Send**.



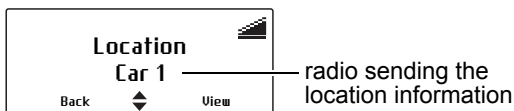
The message **Location sent** briefly appears in the display.



Receiving and logging location information

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

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

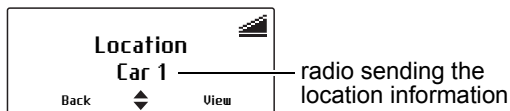


The location information can then be viewed and logged. The most recent location details of up to 10 radios will be available, until the radio is turned off.

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

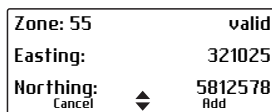
To display and log the received location of a radio:

1 Press **View**.



The location information appears in the display.

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



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



Radios can also be added to Team Locations by pressing **Menu**, selecting **Location Svcs > Team Locations**, pressing **Options** and selecting **Add**; then select whether to add a radio from the **Recent talkers** list, or by entering a **Dialed number**.

Accessing logged location information



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

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 Svcs > Team Locations**.
- 2 Scroll to the radio you want and press **Options**.

Team Locations	
Car 1	
Car 2	
Back	Options

- 3 Select **View**.

Options	
View	
Add	
Back	Select

The latest location information available for that radio appears.

Zone: 55	valid
Easting:	321025
Northing:	5812578
Back	

- 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.

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.



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



10 Emergency operation

This section describes how to make different types of emergency calls.

This section covers:

- [About emergency calls](#)
- [Making a priority call](#)
- [Standard emergency mode](#)
- [About manual emergency operation](#)
- [Accessing emergency location information](#)
- [Loneworker monitoring](#)

About emergency calls



Warning When emergency mode is activated, your encryption keys may be automatically deleted from your radio.

In an emergency you can summon help by sending an emergency call. There are three 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. For further information see "Making a priority call" on page 106 .
Standard emergency call	When an emergency call is initiated, the radio enters 'emergency mode'. For further information see "Standard emergency mode" on page 107 .
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 "About manual emergency operation" on page 108 .

Making a priority call

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.

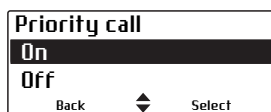
Any calls you make while the priority call feature is turned on are flagged as emergency calls.

To turn the priority call feature on and off:

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**.**



Standard 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.



Warning 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 107](#).

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 emergency modes are summarized below. The length of each phase is determined when the radio is programmed.

When the emergency key is pressed:

①

Digital channels: the radio continually sends emergency 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.

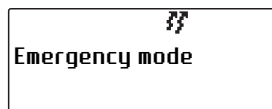
(Emergencies end once this phase is complete or when you end emergency mode.)

Activating emergency mode

You can activate emergency mode using the emergency function key.

- 1 Long press the function or emergency key to activate emergency mode.

'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 107](#).

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

About manual emergency operation

This feature is available for digital channels only.

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.

Making a manual emergency call

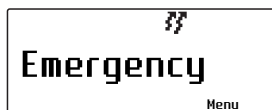


Warning You will not be able to make a voice call on the channel until the 3-second emergency alarm has finished.


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

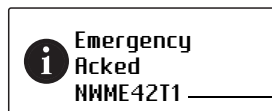
The radio gives three short beeps, rising in pitch.

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



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

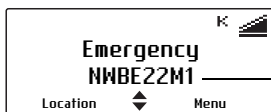
-  This feature is controlled by a software license (SFE) and may not be available with your radio.



alias of
acknowledging radio

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.



radio in
emergency

location information
available

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

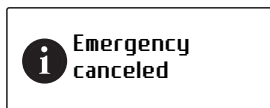
Canceling a manual emergency call

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 in the display.

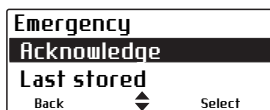


Your radio now returns to the channel that it was operating on prior to the emergency call.

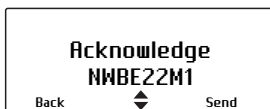
Canceling a manual emergency call you have received

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 acknowledgement cancels the call.

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

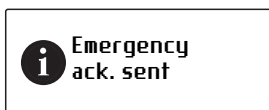


The name of the radio that initiated the emergency call appears in the display.



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

The message **Emergency ack. sent** briefly appears in the display.



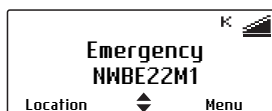
Accessing emergency location information

If **Location** appears in the display, above the left selection key, you can display the current location of the radio that has sent a manual emergency call. The last location of the radio will still be available even if the radio is turned off and then on again.

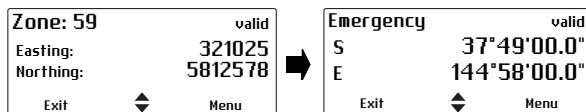
To access the location information, either press **Location** or use the Last Stored menu.

Using the Location menu

- 1 Press **Location** to display the current location of the radio.



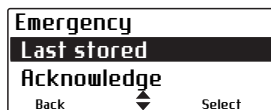
- 2 Use the scroll keys to view more location information.



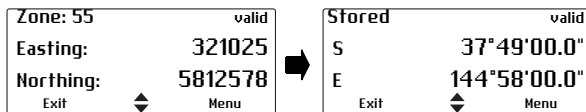
- 3 Press **Exit** to return to the previous display.

Using the Last stored menu

- 1 Press **Menu** and select **Emergency > Last stored** to display the current location of the radio.



- 2 Use the scroll keys to view more location information.



- 3 Press **Exit** to return to the previous display.

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.

A loneworker alarm is activated if for a predetermined period of time:

- the radio has been tilted by more than 60 degrees (man down)
- the radio has not moved
- there has been no user activity



Your radio may be programmed to respond to a combination of these events.

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

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.

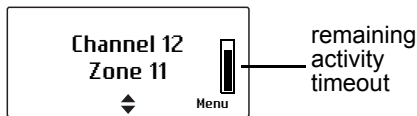
Activating loneworker monitoring

- 1 Press **Menu** and select **Radio Settings > Extra features > Loneworker**. (Depending on how your radio is programmed, you may be able to press a function key to turn loneworker monitoring on and off.)



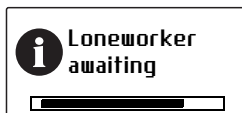
- 2 In the Loneworker menu, choose **On**.

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



Responding to a loneworker alarm

You hear a beep indicating 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.

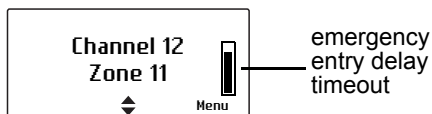


- Press any key.
- If using the man down feature, restore the radio to an upright position.

Otherwise the radio will activate emergency mode or (in trunked mode) send a status update.

Delaying the emergency action (conventional mode only)

In conventional mode, an additional emergency entry delay may be programmed which allows you to press a scroll key within a programmed time (usually 10 seconds) after the response time expires to delay the emergency action.




You now have the opportunity to turn the radio off and on to cancel the loneworker alarm.



The emergency action can be delayed only once.

11 Encryption

This section describes how to use encryption to make your communications completely private.

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

This section covers:

- [About encryption](#)
- [Encrypting calls](#)
- [Making an encrypted call](#)
- [Receiving an encrypted call](#)
- [Changing the radio's encryption key](#)
- [Removing encryption keys from the radio](#)
- [Updating encryption keys over-the-air](#)
- [Using an encryption demonstration key](#)

About encryption

The encryption feature is available for digital and dual-mode channels only.

To make communications with other users on your system completely private, your radio may be able to encrypt outgoing calls, using a confidential encryption key. The radio receiving your call must have the same encryption key installed before it can hear your encrypted call.


About the proper key detect feature

Your 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.

Note that encryption does not need to be turned 'on' for the radio to unmute.

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

Encrypting calls

Your radio may be able to turn encryption on and off. While encryption is on, your outgoing calls are encrypted on channels programmed for encryption, and the encryption icon  remains in the display.

This setting only affects outgoing calls. Incoming calls will still be decoded by your radio so long as the key required to decode the call is stored in your radio.

To turn encryption on or off:

- 1 Press **Menu** and select **Security > Encryption**.
(Depending on how your radio is programmed, you may be able to press a function key to turn encryption on and off.)
- 2 Scroll to **On** (or **Off**) and press **Select**.



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

Using the 3-way selector

To turn encryption on and off using the 3-way selector:


- 1 Rotate the 3-way selector to either position A or B to turn encryption on.

The message **Encryption activated** briefly appears in the display.

- 2 Rotate the 3-way selector to position C to turn encryption off.


The message **Encryption deactivated** briefly appears in the display.

Making an encrypted call

- 1 Select the channel or group you wish to call.
- 2 Check that encryption is on ( is showing in the display).
- 3 Press and hold the PTT key to transmit.

The name of the encryption key that your radio is using for the transmission may briefly appear in the display.

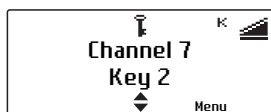


While you are transmitting, the LED glows red and  appears in the display.

Receiving an encrypted call

When you receive an encrypted call, your radio unmutes and you can hear clear speech, so long as the key required to decode the call is stored in your radio.

The name of the encryption key used to encrypt the incoming call may briefly appear in the display, below the name of the caller.



If the key required to decode the call is not stored in your radio, then your radio remains muted.

Your radio may also remain muted if the currently selected channel has 'proper key detect' programmed.

Changing the radio's encryption key

You may be able to use the **Change All** menu to change the encryption key that encrypts your outgoing calls. You can then use the **Preset Keys** menu to change the encryption keys back to the default encryption key for each channel.



Warning Once you change the encryption key, it may also automatically update the encryption keys used to encrypt calls on other channels.

Changing the transmit encryption key

- 1 Press **Menu** and select **Security** > **Change all**.
- 2 Scroll to the key you want and press **Select**.



The message **Global key selected** briefly appears in the display.

Changing the transmit encryption key back to the default setting

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



The message **Select preset keys?** appears in the display.

- 2 Press **OK** and the message **Preset keys selected** briefly appears in the display.

Changing the encryption keyset

It may be possible for you to change the encryption data associated with the encryption keys loaded in your radio.

- 1 **Menu** and select **Security** and select **Security** > **Change keyset**.

- 2 Scroll to **01** or **02** and press **Select**.



The message **Keyset selected** briefly appears in the display.

Removing encryption keys from the radio

It may be possible for you to delete encryption keys from your radio.



Warning When emergency mode is activated, or when your radio is immobilized ('inhibited'), your encryption keys may be automatically deleted from your radio.

Deleting an encryption key


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

The message **Single key zeroized** briefly appears in the display.

Deleting all encryption keys


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

The message **Zeroize all keys?** appears in the display.

- 2 Press **OK** and the message **All keys zeroized** briefly appears in the display and  no longer appears.

Updating encryption keys over-the-air

You may be able to update your encryption keys using over-the-air-rekeying (OTAR).

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

This feature is only available for digital channels operating in conventional mode.

- Press **Menu** and select **Security > Rekey request**.

The message **Rekey request ack** appears in the display. If there is no response to the rekey request, the message **Rekey request timeout** appears.

Using an encryption demonstration key

Your radio may be programmed with an encryption 'demo' key. The demo key is used to demonstrate the way encryption operates, without the need to load secure encryption keys into the radio.

Activating the demo key

- 1 Press **Menu** and select **Security > Advanced > Demo key**.
- 2 Scroll to **Enable** and press **Select**.



The message **Demo key activated** appears in the display.

Making an encrypted call using the demo key

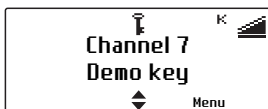
To encrypt your transmissions using the demo key:

- 1 Activate the demo key on your radio.
- 2 Turn on encryption. See ["Encrypting calls" on page 116](#).
- 3 Make the call. See ["Making an encrypted call" on page 117](#).

Receiving an encrypted call using the demo key

Once the demo key is activated on your radio, the radio unmutes when you receive a call encrypted using the demo key, and you can hear clear speech.

The identity of the caller appears in the display, along with the encryption key name.



Note that you do not need to have encryption turned on to be able to hear an encrypted call.

12 Customizing radio settings

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

This section covers:

- [Extending battery life on a shift](#)
- [Changing the volume of all audible indicators](#)
- [Changing the volume of keypress tones](#)
- [Changing to quiet operation](#)
- [Changing to silent operation](#)
- [Turning on backlighting](#)
- [Adjusting the display contrast](#)


Extending battery life on a shift

You can reduce the power consumption of your radio (and thereby extend the life of the battery during a shift) in the following ways:

- Transmit at low power (if your radio is not already configured to do this).
- Ensure that backlighting automatically turns off when no radio activity is detected (see ["Turning on backlighting" on page 127](#)).

Turning low power transmit on or off

If you are using your radio in conditions where signal strength is high, you can extend the shift life of your battery by transmitting at low power.

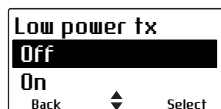
When low power transmit is turned on,  appears in the display and calls are made at low power rather than at the programmed power setting.

To turn low power transmit on or off for all channels:

- 1 Press **Menu** and select **Radio settings > Functions > Low power tx**.

(Depending on how your radio is programmed, you may be able to press a function key to turn low power transmit on or off.)

- 2 Scroll to **On** (or **Off**) and press **Select**. (The current setting is highlighted.)



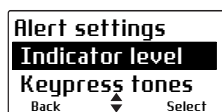
The message **Low power tx activated** (or **deactivated**) appears in the display.

Changing the volume of all audible indicators

You can set the volume of all the audible indicators to either high or low. Audible tones include incoming call tones, warning tones and confirmation tones.

To change the volume of your radio's audible tones:

- 1 Press **Menu** and select **Radio settings** > **Alert settings** > **Indicator level**.



(Depending on how your radio is programmed, you may be able to press a function key to change the level of indicators.)

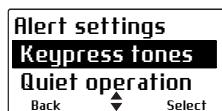
- 2 Scroll to **High** (or **Low**) and press **Select**.

Changing the volume of keypress tones

Whenever you press the radio keys, the keypress tones give you an audible indication as to whether or not your action is allowed. A short, medium-pitched beep indicates that an action is allowed. A long, low-pitched beep indicates that the action is not allowed.

To change the volume of your radio's keypress tones:

- 1 Press **Menu** and select **Radio settings** > **Alert settings** > **Keypress tones**.



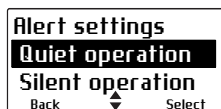
- 2 Scroll to either **Off**, **Low** or **High** and press **Select**.

Changing to quiet operation

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

To turn quiet operation on or off:

- 1 Press **Menu** and select **Radio settings** > **Alert settings** > **Quiet operation**.



(Depending on how your radio is programmed, you may be able to press a function key to toggle quiet operation on and off.)

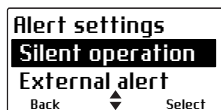
- 2 Scroll to **On** (or **Off**) and press **Select**.

Changing to silent operation

When silent operation is on, all the radio's audible tones are turned off, and only channel traffic can be heard.


To turn silent operation on or off:

- 1 Press **Menu** and select **Radio settings** > **Alert settings** > **Silent operation**.



- 2 In the Silent Operation menu, scroll to either **On** or **Off** and press **Select**.

(Depending on how your radio is programmed, you may be able to press a function key to toggle silent operation on and off.)

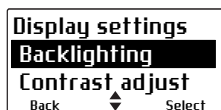
While silent operation is on, the  icon appears in the display.

Turning on backlighting

Whenever a key is pressed or a call is received, the keypad and display light up automatically. Backlighting only remains on for a few seconds, unless there is further radio activity. When backlighting is turned on, it remains on until the setting is changed to **Off**, regardless of radio activity.

To turn backlighting on or off:

- 1 Press **Menu** and select **Radio settings** > **Display settings** > **Backlighting**.



(Depending on how your radio is programmed, you may be able to press a function key to toggle backlighting on and off.)

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

Turning backlighting on momentarily

You may be able to use a programmed function key to turn backlighting on momentarily.

- Press the assigned function key to turn backlighting on. Backlighting remains on for a few seconds, and then turns off.

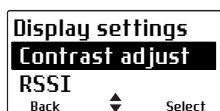
Alternatively, the function key may be programmed so that:

- a short key press turns backlighting on momentarily, and
- a long key press turns backlighting on, and it remains on until there is a further long key press.

Adjusting the display contrast

To 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 to adjust the display contrast to the level you want.



- 3 Press **Save** to save this setting.

13 Charging and caring for batteries

This section describes how to charge your Tait radio battery as well as care for it, to ensure maximum performance and prolonged battery life.

This section covers:

- [About the chargers](#)
- [Special conditions when using IS radios](#)
- [Before using the charger](#)
- [Charging the battery](#)
- [Maintaining battery life and performance](#)
- [Storing batteries](#)
- [Disposing of batteries](#)

About the chargers

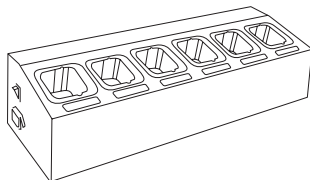
There are three types of charger available for your Tait radio battery:

- **Desktop charger:** Small enough to fit on a desk, it charges one battery at a time.



In Brazil, portable radios are only allowed to use the desktop charger.

- **Multicharger:** Charges up to six batteries. It can be mounted on a desk, on a wall, or in an equipment rack.



Warning The multi-charger must be connected to an earthed mains socket-outlet.

- **Vehicle charger:** Charges one battery at a time while installed in a vehicle.



Notice Tait recommends that you use a desktop charger or multicharger, not the vehicle charger, to prime a nickel metal hydride battery (see [page 27](#)). After a battery is primed, the battery does not require regular additional charging in a desktop charger or multicharger.

Unless otherwise indicated, the charging advice and instructions in this chapter apply to all chargers.

Special conditions when using IS radios



Warning Fit only an IS-approved battery to an IS radio. Fitting a battery or accessory that is not IS-approved exposes the customer to a risk of explosion which could cause serious injury or death.

For detailed information about identifying IS radios, see ["Intrinsically Safe radios" on page 16](#).

Before using the charger

Handle the battery safely



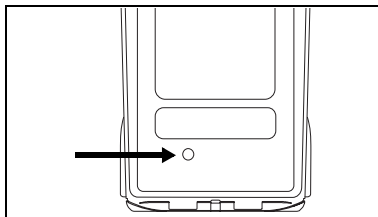
Warning Handle the battery safely. Failure to observe the following handling recommendations could result in personal injury and/or equipment damage.

- The battery label identifies the battery chemistry as lithium-ion (Li-ion) or nickel metal hydride (NiMH). Before using a Li-ion battery, please read the Li-ion Battery Safety Information (MPC-00006-xx) included with your battery, and follow the instructions it provides. Incorrect use of a Li-ion battery can cause explosion or fire and can result in personal injury and/or equipment damage.
- Do not short-circuit the battery contacts, neither intentionally nor accidentally, e.g. by placing the battery with conductive materials such as keys or jewelry inside a pocket or container. Short-circuiting the battery contacts can heat up the conductive material.

Attaching of labels



Warning Do not obstruct the vent hole on the battery. If the vent on the battery is obstructed the battery may explode, causing personal injury and/ or damage to property.



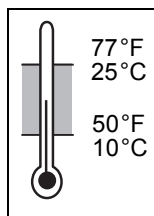
For detailed information about attaching labels safely, see ["Attaching labels to the radio or battery" on page 26](#).

Charging temperatures

Notice Do not expose a battery to very high or very low temperatures for extended periods of time. Doing so will shorten the usable life ('service life') of the battery.

To achieve the best results when charging your battery:

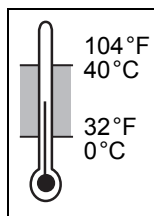
- Before you begin to charge your battery, make sure that the battery temperature is close to the room temperature in which the battery is to be charged.
- If possible, charge the battery in temperatures between 50°F and 77°F (between 10°C and 25°C). This temperature range is the optimal charging range.



Temperature range

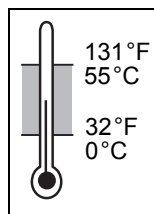
Charging only starts when the battery is between the following temperature ranges:

- Li-ion battery: 32°F to 104°F (0°C to 40°C).



- NiMH battery: 32°F to 131°F (0°C to 55°C).

Notice Although charging will only start if the battery temperature is below 113°F (45°C), charging will *continue* up to 131°F (55°C).



Temperature indications

- ○ ● When the battery temperature is outside the normal charging range, the orange LED on the charger is lit. Charging will start or resume once the temperature is within normal limits, and no action is required by you.

Leaving the battery on charge

You can leave a battery/radio in the charger once charging is complete. Leaving a battery in the charger will not overcharge or damage it.

You can remove a battery/radio from the charger at any time without harming the battery, the radio, or the charger. When you return the battery/radio to the charger, charging is automatically resumed.

Vehicle charger only

It is safe to switch off the ignition while there is still a battery in the charger. But if the vehicle will not be used again for some time, check whether charging will continue while the ignition is off, and consider what effect this might have on the vehicle battery.

To check, place the battery in the charger and switch off the vehicle ignition:

- If no charger LED stays lit, the charger will resume charging only when the ignition is switched on again. Minimal charger standby power will be drawn from the vehicle battery until then.
- If a charger LED stays lit, the charger will continue to charge the radio battery even while the ignition is off, and will continue to draw power from the

vehicle battery. Once the battery is charged, the charger draws minimal current and has little effect on a healthy vehicle battery.

Receiving calls while charging

Notice For best charging performance, switch off the radio before placing it in the charger.

You can receive a call while the radio is in the charger. If you do remove the radio from the charger to answer a call, the call will not be disrupted.

Removing the radio from the charger to make or receive a call ends the charging process. Charging safely recommences when the radio is reinserted into the charger.




If the radio was turned on while being charged, the battery indicator may not be accurate when the radio is initially removed from the charger. After a few seconds, the battery indicator is updated to display the amount of charge available in the battery.

Vehicle charger only

When a portable radio is used inside a vehicle, radio performance is degraded. Use a mobile radio for all critical communications. If the portable must be left switched on while it is in the vehicle charger, removing the portable from the vehicle charger to receive or make a call will improve radio performance.

Low battery warning

When the battery is low, your radio warns you in the following ways:

- The battery icon  on the radio display looks empty.
- The status LED on the radio slowly flashes red.
- A high-pitched beep sounds.

You should recharge or replace the battery as soon as possible. When the battery is completely empty, the message **Battery is flat** appears on the display. The radio emits a long, low-pitched beep and then stops working. Turn off the radio immediately.

Notice Do not allow a radio battery to fully discharge every time you use it, or you will shorten the service life of the battery.

Charging the battery

Notice If you are charging a battery for the first time, follow the instructions on [page 27](#).

- 1 Desktop charger—connect the charger to the correct Tait power adaptor.


Multicharger and vehicle charger—power on the charger.

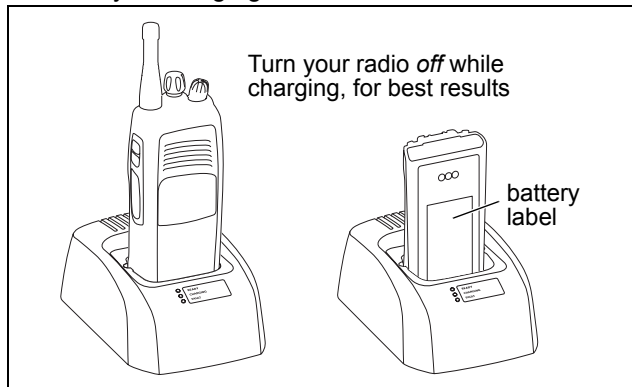


Initially, all three LEDs are lit for two seconds.

- 2 Place just a battery in the charger, or a radio with a battery attached. There is no need to remove a belt clip, antenna, or any accessory that is attached to the accessory connector.

Notice For best charging performance, switch off the radio before placing it in the charger.

If a radio is attached and turned on, the battery indicator on the radio display shows that the battery is charging. 



The red LED lights up, and stays lit while the battery charges. For a battery that is almost completely discharged, allow two hours.










If the red LED flashes, then your NiMH battery is being primed. See ["Charging the battery before first use" on page 27](#).



When charging is complete, the green LED stays lit.

LED behavior

If there is a battery in the charger when power is supplied to the charger, the LEDs behave as follows:

LEDs	Meaning
 briefly	The charger has been connected to a power supply
 flashing	A NiMH battery is being primed. If possible, do not interrupt until the green LED is lit
 steady	The battery is charging
 steady	Charging complete. Remove the battery, or leave it in the charger.
 steady	The battery temperature is outside the normal charging range. Charging will start or resume once the temperature is within normal limits. No action is required by you.
 flashing	There is a fault. See "Troubleshooting the charger" on page 147 .
 steady	There is a fault. See "Troubleshooting the charger" on page 147 .

If the charger does not behave as expected:

- Make sure the radio or battery is seated properly in the charger.
- Check that the charger is properly plugged in.
- Check that the battery and charger contacts are clean. To clean, wipe the contacts with a dry lint-free cloth to remove any dirt, oil or grease.

Removing the battery from the charger

- Desktop charger and multicharger: Lift the battery/radio out of the charger.
- Vehicle charger: Press down once firmly on the release bar at the top of the vehicle charger and then lift out the battery/radio.

You can remove a battery/radio from the charger at any time without harming the battery, the radio, or the charger. When you return the battery/radio to the charger, charging is automatically resumed. You can also leave a battery/radio in the charger once charging is complete.

Maintaining battery life and performance

With proper care and maintenance you will maintain the performance and life of the battery. It is recommended that you:

- Use only Tait batteries and chargers.
- Do not expose a battery to very high or very low temperatures for extended periods of time. Doing so will shorten the service life of the battery.

Very high: above 140°F (60°C)

Very low: less than -22°F (-30°C).

- Charge the battery at a room temperature of between 50°F and 77°F (between 10°C and 25°C). This temperature range is the optimal charging range.
- Allow your NiMH battery to fully discharge once every 3 months. See ["Conditioning NiMH batteries" on page 139](#).
- Store batteries properly when not in use. See ["Storing batteries" on page 139](#).

Cleaning the contacts of the battery

Notice Do not scratch or scrape the contacts of the battery. If necessary, wipe the contacts of the battery with a dry, lint-free cloth to remove any dirt, oil or grease.

Conditioning NiMH batteries

‘Condition’ a NiMH battery every three months to extend its shift life. Conditioning enables a battery to hold its charge for longer.

Notice A Li-ion battery should not be completely discharged. Li-ion batteries, unlike NiMH batteries, do not require conditioning.

To condition a NiMH battery:

- Leave the radio switched on and ignore the ‘low battery’ warnings from the radio.

When the radio switches itself off, the battery is fully discharged and ready to be recharged.

Storing batteries

When not in use for a month or more, batteries should be stored correctly to prolong their life. The way you prepare your battery for storage, depends on the battery chemistry.

Li-ion batteries

- Remove the battery from the radio before storage.
- Fully charge the battery if storing for less than one month.
- Charge the battery to about 30% if storing for longer than one month.
- Store in a cool dry place.

NiMH batteries

- Remove the battery from the radio before storage.
- Store the battery (in either a charged or discharged state) in a cool dry place.

Using batteries after storage

Batteries that have been stored for any length of time must be charged before being used. See ["Charging the battery" on page 135](#).

When first using NiMH batteries that have been in storage for three months or more, you may notice that they do not last an entire shift. This is normal. If stored properly, the battery's optimal capacity should be restored after two or three shifts (charge/discharge cycles).

Disposing of batteries



Run the battery flat before disposing of it. When disposing of the battery, be sure to do so in an environmentally sensitive manner. Please contact your radio provider for information about recycling programs in your area. See ["Environmental responsibilities" on page 9](#) for more information.

14 Troubleshooting

This section describes troubleshooting procedures, and basic maintenance.

This section covers:

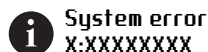
- [About troubleshooting](#)
- [System error message](#)
- [When your radio won't turn on](#)
- ['IS battery unconfirmed' alert](#)
- [Identifying the radio's audible tones](#)
- [Viewing radio information](#)
- [Changing the radio ID](#)
- [Running diagnostics tests](#)
- [Troubleshooting the charger](#)
- [General care](#)

About troubleshooting

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

System error message

If your radio displays a system error message, take a note of the number (**X:XXXXXXXX**), and consult your radio provider.




When your radio won't turn on

If the LED on your radio does not glow red when the radio is turned on, it is probable that power is not reaching the radio. Check the following:

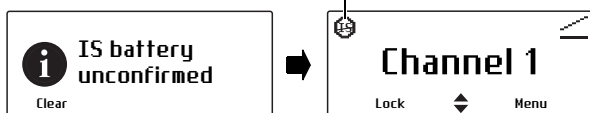
- Is the battery firmly attached to the radio?
- Is the battery sufficiently charged?
- Is the battery charger working properly?

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

‘IS battery unconfirmed’ alert

If a faulty or non-IS battery is attached to the radio, the message IS battery unconfirmed briefly appears in the display, and the battery icon periodically flashes .

non-IS battery icon



Check the following:

- Is the battery an IS battery? For information about identifying IS batteries, see ["Intrinsically Safe radios" on page 16](#).
- Are the three spring-loaded battery pins on the radio moving freely?
- Are the three battery pins (radio) and the three battery contacts (battery) clean?

If all appears to be in order, but the IS battery unconfirmed message still appears, and the battery icon flashes, replace the battery.

If the problem persists, consult your radio provider.

Identifying the radio's audible tones

The radio's audible tones can help you identify a potential problem. See ["Audible tones" on page 41](#).

Viewing radio information

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

Use the Radio info menu to view information such as the hardware and firmware version of your radio, function key settings, the radio serial number, and various radio identities.

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

Checking the version of your radio using the PTT key

- 1 Turn off the radio.
- 2 Hold down the PTT key and turn on the radio.

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

Changing the radio ID

You can change the radio ID if the current ID is not correct.




To change the radio ID your radio must have alphanumeric keys.

- 1 Press **Menu** and select **Radio settings > Radio info > Radio ID**.
- 2 Press the right selection key.
- 3 If **Enter PIN** appears in the display, enter the correct sequence of keys (known as the technician access PIN).
- 4 Press **Clear** to delete the current ID, and use a combination of the scroll keys and alphanumeric keys to enter a new ID.

- 5 Press **Options** > **Store** to save the new ID.

Running diagnostics tests

Diagnostics tests are available via the main menu.

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

- 1 Press **Menu** and select **Diagnostics**.
- 2 Scroll to the name of the test you want to run and press **Select**.

The following table lists diagnostics tests you may find on your radio.

Notice The radio may transmit when you select some tests. Make sure you have a suitable load or antenna connected before running diagnostics tests.

Test	Description
Audio loopback test	Routes audio from an external accessory microphone to the radio's internal speaker. Before running this test, turn the volume down to limit interference and reduce the impact of audio artefacts.
Display freq	Displays the transmit and receive frequencies of the current channel. Also displays the channel status (CNV, TCH, CCH ¹) and the mode (ANA, PH1 ²). If the radio is scanning this information may not be available.
GPS NMEA data	Displays the last raw data received from the radio's internal GPS. The radio will display all supported sentence formats received (for example \$GPRMC and \$GPGGA sentences). Note that the display will not automatically refresh when new data is received.
Keypad test	Sounds an audible tone when a key is pressed or released on the radio, or the 16-way and 3-way selectors are moved. The radio also displays the key or selector name along with "pressed" or "released" or the new selector position.
QoS (P25 channels only)	Displays information about the quality of service (received signal strength (RSSI) with an indication of digital voice quality). Also displays the channel status (CNV, TCH, CCH ¹) and the mode (PH1 ²).



Test	Description
RSSI	Displays the received signal strength (RSSI) of the current channel.
Rx 1011	Receives a 1011HzHz tone and displays the received signal strength (RSSI) and the bit error rate (BER) of the received signal. Also displays the channel status (CNV, TCH, CCH ¹) and the mode (PH1 ²).
Site display	Shows the channel number, signal strength and system-identity code (SYSCODE) for the currently registered trunked site.
Site measure	Lists the current trunked site (indicated with an asterisk) and up to six detected adjacent sites, with received signal strength (RSSI) information.
Tone test	Generates an audible tone for the duration of the test.
Tx 1011	Transmits a tone of 1011HzHz on the current P25 channel.
Tx 1011 Cal	Transmits a 1011HzHz tone on the current channel with a bit error rate (BER) of 5%.
Tx power test	Displays hardware-related information while the radio is transmitting. Information includes the final PA current (in mA)

1. CNV=conventional, TCH=traffic channel, CCH=control channel

2. ANA=analog, PH1=P25 Phase 1

Troubleshooting the charger

The table below describes what to do if the orange (right) LED on the battery charger is either flashing or glowing.

Charger orange LED	Meaning	Possible reason(s) and solution
Flashing 	Fault	<ul style="list-style-type: none">■ The battery is not compatible with the charger. Use only Tait chargers and batteries. See "Checking compatibility" on page 148.■ The charger firmware is not compatible with the battery type. See "Checking the firmware version of your charger" on page 148.■ There is insufficient voltage to the charger. Check you are using the correct power adaptor.■ The battery may be deeply discharged (less than 3V). Disconnect the battery from the radio and charge the battery.■ The battery may be faulty. Consult your radio provider for advice.■ If all orange LEDs are flashing on the multicharger, the charger itself may be faulty (e.g. the fan may be jammed or faulty). Consult your radio provider for advice.
Glowing 	Charging suspended	The battery is either too hot or too cold. Charging will start or resume once the temperature is within normal limits. No action is required by you.

Checking compatibility

Check the battery label to see whether the battery is Li-ion or NiMH. The TP9100 chargers support the following batteries:

Charger	Battery type
Desktop charger (TPA-CH-001)	NiMH only
Desktop charger (TPA-CH-002)	<ul style="list-style-type: none">■ NiMH■ Li-ion if the charger has firmware version 2.02¹ or later (after serial number 21066083)
Multicharger	<ul style="list-style-type: none">■ NiMH■ Li-ion if the charger has firmware version 2.02¹ or later (after serial number 21067274)
Vehicle charger	All

1. To check the firmware version of a charger, see ["Checking the firmware version of your charger" on page 148](#) below.

Checking the firmware version of your charger

To check the firmware version of a charger:

- 1 Remove DC power from the charger.
- 2 Insert a metal object, such as a screwdriver, into the cradle, and use the object to short the middle two battery contacts.
- 3 While shorting the contacts, reapply DC power and count how often the charger LEDs flash:
 - the number of red LED flashes indicates the *major* version number.
 - the number of green LED flashes indicates the *minor* version.
 - the number of orange LED flashes indicates the *patch* version.

For example, if the charger has firmware version 2.02.01 installed, the red LED flashes twice, then the green LED flashes twice, and then the orange LED flashes once.

General care

Your radio requires no regular maintenance other than ensuring that the battery has sufficient charge and that no damage has occurred to the antenna or the battery.

Notice 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.

For general battery care, see ["Maintaining battery life and performance" on page 166](#).

Cleaning the contacts of the battery

Notice Do not scratch or scrape the contacts of the battery. If necessary, wipe the contacts of the battery with a dry, lint-free cloth to remove any dirt, oil or grease.

Cleaning the radio

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

15 Glossary

A

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

C

channel In a conventional system, a channel is a pair of frequencies used to transmit and receive radio signals.

In a P25 trunking system, a channel is a group of radio users.

control channel In a P25 trunking system, the control channel is used by the trunking site to let the radio units in the site's coverage area know when they can transmit their call information.

conventional operation In conventional operation, the radio is tuned to a programmed channel, and communicates with other radios either on that channel, or through a repeater system.

F

failsoft

Failsoft operation offers P25 conventional operation if the radio cannot acquire a control channel on a trunking system for an extended period of time. The conventional channel may be a repeater channel or a direct channel.

FCC

Federal Communications Commission, an independent United States government agency that regulates interstate and international radio communications.

L

LED

Light Emitting Diode, a device that is able to emit light.

M

mute

A mute controls the circumstances under which a received signal is passed to the radio's speaker. For example, when a signal is received by the radio, the mute may remain 'closed' if the signal is not strong enough, does not have valid signaling or is encrypted.

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. The repeater extends the range of radio communications by receiving and re-transmitting signals received from radios.

RF

Radio Frequency, the part of the electromagnetic spectrum that is suitable for radio transmissions. The frequency of the RF signal is described in terms of the number of cycles per second or Hertz (Hz).

RSSI

Received Signal Strength Indicator, an icon or number that shows the strength of a received signal.

T

traffic channel

The traffic channel is the channel on a trunking system to which the parties participating in a call are directed to for the duration of the call. When the call ends, the traffic channel is returned to the pool of channels for use in a new call.

trunking operation

In trunking operation, the trunking system manages the communications channels used by the radio, and shares a number of channels among a large number of radio users.

V

valid signal

A valid signal is a signal that the radio responds to by unmuting the receiver. A signal may be valid, for example, when it is stronger than a minimum level or has special signaling that matches the signaling programmed for the receiving radio.

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Directive 1999/5/CE Declaration of Conformity

da Dansk

Undertegnede Tait Limited erklærer herved, at følgende udstyr TPAB1A, TPAH5A & TPAH6A overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EG.

Se endvidere: www.taitradio.com/eudoc/

de Deutsch

Hiermit erkläre Tait Limited die Übereinstimmung der Geräte TPAB1A, TPAH5A & TPAH6A mit den grundlegenden Anforderungen und den anderen relevanten Festlegungen der Richtlinie 1999/5/EG.

Siehe auch: www.taitradio.com/eudoc/

el Ελληνικά

H Tait Limited δηλώνει ότι το TPAB1A, TPAH5A & TPAH6A συμμορφώνεται προς τις ουσιώδεις απαιτήσεις και τις λοιπές σχετικές διατάξεις της Οδηγίας 1999/5/EK.

Βλέπε επίσης: www.taitradio.com/eudoc/

en English

Tait Limited declares that this TPAB1A, TPAH5A & TPAH6A complies with the essential requirements and other relevant provisions of Directive 1999/5/EC.

See also: www.taitradio.com/eudoc/

es Español

Por medio de la presente Tait Limited declara que las radios TPAB1A, TPAH5A & TPAH6A cumplen con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE. Véase también:

www.taitradio.com/eudoc/

fi Suomi

Tait Limited vakuuttaa täten että TPAB1A, TPAH5A & TPAH6A tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.

Katso: www.taitradio.com/eudoc/

fr Français

Par la présente, Tait Limited déclare que les appareils TPAB1A, TPAH5A & TPAH6A sont conformes aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

Voir aussi: www.taitradio.com/eudoc/

it Italiano

Con la presente Tait Limited dichiara che questo TPAB1A, TPAH5A & TPAH6A è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

Vedi anche: www.taitradio.com/eudoc/

nl Nederlands

Hierbij verklaart Tait Limited dat het toestel TPAB1A, TPAH5A & TPAH6A in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.

Zie ook: www.taitradio.com/eudoc/

pt Português

Tait Limited declara que este TPAB1A, TPAH5A & TPAH6A está conforme com os requisitos essenciais e outras provisões da Directiva 1999/5/CE.

Veja também: www.taitradio.com/eudoc/

sv Svensk

Härmed intygar Tait Limited att denna TPAB1A, TPAH5A & TPAH6A står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

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