

# TM9356/TM9456 Mobile Radios Dual Body User's Guide

MMB-00037-01 · Issue 1 · March 2021



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For the address and telephone number of regional offices, refer to our website: [www.taitradio.com](http://www.taitradio.com)

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Tait International 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.

## About this guide

This user's guide provides information about the TM9356 and TM9456 dual body mobile radios. The radio behavior described in this guide applies to radios with firmware version TM9356 v2.27.00 and TM9456 v2.18.00 and higher. If you need further assistance or your radio does not operate as you expect, contact your radio provider.

For information about installing your TM9456 or TM9356 radio, go to <http://support.taitradio.com>

# For your safety

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

## 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.



## 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 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.



### **Warning** RF exposure hazard!

To comply with FCC and Industry Canada RF exposure limits, mount the antenna at a location such that no person or persons can come closer than 35 inches (0.9m) to the antenna:

For radios with a transmit power >25W:

VHF radios must be installed using an antenna mounted centrally on the vehicle roof, with a gain of 2.15dBi or 5.15dBi.

UHF and 800MHz radios must be installed using an antenna mounted either centrally on the vehicle roof with a gain of 2.15dBi or 5.65dBi, or centrally mounted on the trunk with a gain of 5.65dBi.

900MHz radios must be installed using an antenna mounted either centrally on the vehicle roof or centrally mounted on the trunk with a gain of 2.15dBi or 8dBi.

For radios with a transmit power of 25W:

The radio must be installed using an externally mounted antenna with a gain of either 2.15dBi or 5.15dBi.

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

- Do not talk (transmit) on the radio more than the rated transmit duty cycle. This is important because the radio radiates more energy when it is transmitting than when it is receiving.
- While you are transmitting (talking or sending data) on the radio, you must ensure that there is always a distance of 35 inches (0.9m) between people and the antenna. This is the minimum safe distance.

- Use the radio only with Tait-approved antennas and attachments, and make only authorized modifications to the antenna otherwise you could damage the radio and violate FCC regulations.

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

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

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

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

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

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

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

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

## **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.

## **Australia and New Zealand citizens band (476.4 to 477.4 MHz)**

AS/NZS 4365 deals with the use of frequencies in the 476.425 to 477.400 MHz band. Products capable of operating in this band have been approved for operation in the UHF Citizens Band Radio Service which is licensed in Australia by the ACMA Radiocommunications (Citizens Band Radio Stations) Class Licence and in New Zealand by the MED General User Radio Licence for Citizens Band Radio. Operation is subject to conditions contained within those licences.

Repeaters operate by receiving a transmission on one channel and re-transmitting it on another. Operators are required to avoid using local repeater input channels, which will be in the range of 31 to 38, unless it is intended to use the repeater facility, and to avoid using local repeater output channels, which will be in the range 1 to 8, at any time.

No voice transmissions are permitted on data channels 22 and 23. Equipment meeting this standard will inhibit voice operation on channels 22 and 23.

In Australia:

- Except in an emergency, a CB transmitter must not be operated on UHF channels 5 and 35.
- Channel 11 is the customary calling channel for establishing communications.
- Channel 40 is the customary road vehicle channel.

## **Health, safety, and electromagnetic compatibility in Europe**

In the European Community, radio and telecommunications equipment is regulated by Directive 2014/53/EU, 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**

To download the formal declaration of conformity, go to [www.taitradio.com/eudoc](http://www.taitradio.com/eudoc).

## Interference with electronic devices



**Warning** Some electronic devices may be prone to malfunction due to a lack of protection from the 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.


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.


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** Warning 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.

## 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 mobile radio.

 **Warning** To avoid damage to existing wiring, airbags, petrol 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.

## **Radio protection when charging the vehicle battery**

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

## **Electromagnetic compatibility in European vehicles**

Installation of this product in a vehicle must be performed according to the instructions provided by the vehicle manufacturer. For more information, refer to the vehicle manufacturer's website or contact the vehicle manufacturer's dealer.

Mobile radios should be installed in accordance with the FCS1362:2016 UK Code of Practice.

**Notice** Failure to install the product correctly may void the vehicle's type-approval. The owner could be held responsible for any damage resulting from vehicle failure that can be attributed to RF energy interfering with the vehicle systems.

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



## High radio surface temperatures



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

### **EN 62368 requirements (25 watt radios)**

This radio complies with the European Union standard EN 62368 when operated up to the rated 33% duty cycle of two minutes transmit and four minutes receive, and with ambient temperatures of 86°F (30°C) or lower.



**Caution** Operation outside these limits may cause the external temperature of the radio to rise higher than this standard permits.

## GNSS operation

Tait International Limited is not responsible for the operation or failure of operation of GNSS satellites or the availability of GNSS satellite signals.

### **Acknowledgement:**

The radio uses an implementation of UTM conversion sourced (with permission) from Geoscience Australia (GA).



# Your radio's settings

Use the following table to list your radio's programmed settings.

## Function key settings

	Conventional	Trunked
F1	_____	_____
F2	_____	_____
F3	_____	_____
F4	_____	_____
F5	_____	_____
F6	_____	_____

quick access  
menus:



\_\_\_\_\_

\_\_\_\_\_

## Frequently used channels and groups

ID/Number	Description	ID/Number	Description
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____



## Scope

This document is supplementary to the TM9300 User's Guide (**MMB-00001-xx**), and the TM9400 User's Guide (**MPD-00003-xx**).

It provides a brief description of dual radio system operation.

For information related to radio controls, microphone, control head, radio display (symbols, indicators), tones, menus and settings, please see the applicable user's guide.

For further information, please see the Tait Support Website: <http://support.taitradio.com> or contact your local Tait provider.

# Dual radio operation

The TM9456/9356 can be installed and programmed as two radios, with one user-interface. This enables you to switch between the radios, and access different features and channels on those radios (for example, channels that operate on different frequency bands). You can also toggle modes that enable you to receive and transmit on both radios at the same time.





Each radio in a system may be identified by a unique name, which appears before all channel and group labels.

The following topics are covered in this section:

- [dual radio display states and descriptions](#)
- [radio controls in a dual radio system](#)
- [about the foreground and background radio](#)
- [switching between radios \(changing the foreground radio\)](#)
- [monitoring more than one radio \(dual receive\)](#)
- [dual transmit mode](#)
- [repeater mode](#)
- [about the lone worker feature](#)
- [lone worker operation](#)
- [lone worker messages and indicators](#)
- [responding to a lone worker prompt](#)
- [responding to a lone worker prompt](#)

## Dual radio display states and descriptions

The following table lists various states of the radio display, and the implications for transmitting and receiving.

Display	Description
	<b>Single Tx/Rx Mode</b> The radio system will receive and transmit on the foreground radio only.
	<b>Dual Rx Mode</b> The radio system will receive on both radios, and transmit on the foreground radio only.
	<b>Dual Transmit Mode</b> The radio system will receive and transmit on both radios.
	<b>Repeater Mode</b> Received signals on either radio will be transmitted on the other radio. If initiating a transmission, the radio system will transmit on both radios <sup>a</sup> .

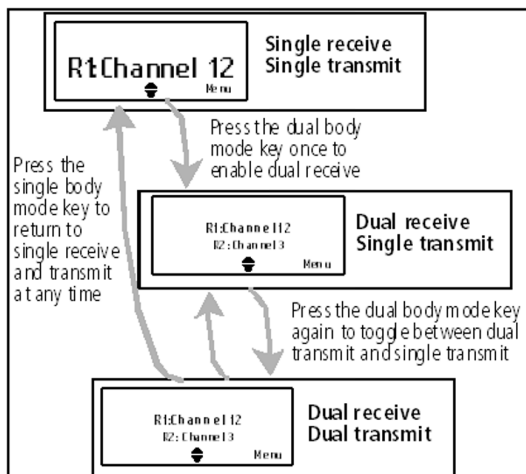
a. This only applies when both radios are operating on analog channels (not digital channels).

## Radio controls in a dual radio system

Certain radio controls and functions are global and apply to the radio system as a whole. The on-off key turns the entire radio system on or off. The volume control adjusts the volume of all received audio and indicators. Functions and menu options relating to the radio display and audible indicators are also global.

Many other functions and menu options apply to the foreground radio only. Examples include changing channels and zones, and toggling monitor. See [“Switching between radios” on page 26](#).

You can switch between the various dual receive and transmit states using one or two function keys programmed for dual body mode and single body mode. If programmed for a single key, dual body mode is assigned to a short press and single body mode is assigned to a long press. The following diagram summarizes how to enable dual receive and dual transmit and how to return to single body mode.





## About the foreground and background radio

The TM9456/TM9356 is installed and programmed as two radios, that can be accessed via the user-interface. In such a dual-radio system, one radio is always at the foreground, and one at the background. If monitoring both radios (dual receive), the speaker volume of the background radio is quieter than the speaker volume of the foreground radio.

To access features on the background radio (such as change the channel), you must first change that radio to the foreground. See “Switching between radios” on [page 26](#).

The foreground radio is either:

- the radio currently showing in the display, or
- the radio showing in larger text



The background radio is the radio not showing in the display, or the radio showing in smaller text.

## Switching between radios (changing the foreground radio)


In a dual-radio system, one radio is always at the foreground and one at the background. For more information, see [“About the foreground and background radio” on page 25.](#)

To change the foreground radio, press the function key programmed for switching the active radio.



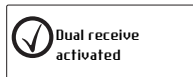
The display will change to show the new radio name, and the currently selected channel or group on that radio.



-  The radio may automatically switch the background radio to the foreground in certain circumstances, for example, when you receive a call with matching signalling, or you receive a short data message.

## Monitoring more than one radio (dual receive)


- 1 Press the function key programmed for dual body mode.

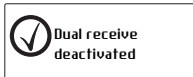


While dual receive is activated, two channels will appear on the default display. The **large text** shows the foreground radio. The **smaller text** shows the background radio.



- 2 If necessary, press the function key programmed for switching the active radio to change the foreground radio.

-  Activity on the foreground radio will be louder than activity on the background radio.
- 3 Press the function key programmed for single body mode to return to receiving on the foreground radio only.




## Dual transmit mode

Dual transmit mode operates as dual receive mode, but also allows a user to initiate PTT-based group calls on both radio bodies simultaneously to transmit on two different bands or channels.


## Repeater mode

Repeater mode allows the radio to be used as an analog conventional repeater. Any activity received on one radio will be automatically transmitted on the other radio, and vice versa.

-  Repeater mode is not currently supported for P25 radios.

## Activating repeater mode by using a function key

- 1 Press the function key programmed for repeater.

While on, the  symbol appears in the display.



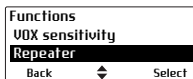
- 2 Press the function key again to turn repeater mode off.



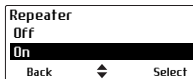
If the repeater mode function is in a non-supported state (one or both of the currently selected channels not set to analog) the icon will flash and the repeat operation will not activate until valid channels are selected on both bodies. Once the system is valid for operation, the icon will stop flashing.

## Activating repeater mode by using the main menu


- 1 Select Menu > Radio settings > Functions > Repeater.



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



- 3 Press **Select**.

While repeater mode is on, the  symbol appears in the display.



## About the lone worker feature

The 'lone worker' emergency feature is designed for people who work alone in potentially hazardous environments. Your radio may be programmed so that lone worker monitoring is active as soon as your radio is turned on, or you may be able to turn lone worker on and off.

While lone worker is active, the radio expects a response from you at regular intervals, and usually prompts you with a warning beep. Typically, this happens every hour.

If you are unable to respond to this prompt, an audible warning may be given shortly before the radio sends an emergency call or enters emergency mode, to warn you and to prevent false activation.

For a detailed explanation of emergency mode, see "Making an Emergency Call" in the TM9400 User's Guide (**MMB-00003-xx**), or the TM9300 User's Guide (**MMB-00001-xx**).



If the radio is operating in silent mode, then any audible indicators for lone worker are turned off.

## Lone worker operation

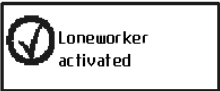
Lone worker monitoring is made up of three stages. The way the radio behaves and the duration of each stage depends on how the radio is programmed.

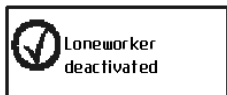
- **Stage 1:** Lone worker is activated and the *user activity* timer begins to count down. This timer is typically set for 60 minutes, but may be programmed for as long as 5 hours.
- **Stage 2:** The user activity time expires and the *user response* timer begins to count down. This timer is typically set for 10 seconds, but may be programmed for as long as 1.5 minutes.
- **Stage 3:** The user response time expires and the radio sends an emergency call or enters emergency mode.

## Lone worker messages and indicators

The following table explains the messages and indicators that may be associated with the lone worker feature.

Your radio may be programmed so that there is no visible or audible indication of lone worker operation

Radio behavior	Explanation
 A rectangular box containing a circular icon with a checkmark and the text "Lone worker activated" below it.	Lone worker has been turned on.



Lone worker has been turned off.

---



Lone worker is active and the *user activity timer* is counting down.

---

user activity  
timer symbol

---

The radio sounds a low-pitched beep.

There has been no user activity and the user activity time has expired.

---



The *user response timer* is counting down.

---

user response  
timer symbol

---

The radio sounds a long, low-pitched beep.


There has been no user activity and the user response time has expired.

---

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

The radio has sent an emergency call and is now in emergency mode.



- 
-  When utilizing dual body, lone worker can only be activated on one body at a time.



## Responding to a lone worker prompt

When the lone worker *user activity* timer expires, the message **Loneworker awaiting** appears on the display and you hear a low-pitched beep.

Alternatively, there may not be any visible or audible indication that the *user activity* timer has expired.

- Press any key, turn the volume control, briefly press the on/off key, or press the PTT key. This resets the lone worker *user activity* timer.

If you are unable to respond, the *user response* timer begins to count down. You now have less than two minutes to respond before the radio automatically sends an emergency call or enters emergency mode.

- Press any key, turn the volume control, briefly press the on/off key, or press the PTT key. This resets the *user activity* timer.

If you are unable to respond, the radio sends an emergency call or enters emergency mode.

## Pressing a function key to reset the user activity or user response timer

When a function key is used to reset either the *user activity* or *user response* timer, the programmed action for the function key is also activated. For example, if you press the lone worker function key to reset either timer, then lone worker is turned off.



If the lone worker feature has entered the "Awaiting" state, keypresses are not actioned. They only reset the lone worker status back to counting down.

# Troubleshooting

## When your radio won't turn on

If the red, green and amber LEDs on the control head do not light up when the radio is turned on, it is likely that no power is reaching the radio. Check the following:

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

If all appears to be in order, then contact your radio provider for further assistance.

Contact your radio service provider for more details.

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For good and valuable consideration, the parties agree as follows:

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**"Documentation"** means product and software documentation that specifies technical and performance features and capabilities; user, operation, and training manuals for the Software; and all physical or electronic media upon which such information is provided.

**"Executable Code"** means Software in a form that can be run in a computer and typically refers to machine language, which is comprised of native instructions the computer carries out in hardware. Executable code may

also refer to programs written in interpreted languages that require additional software to actually execute.

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