

TP9300/TP9400 Portable Radios  
TP9500/TP9600 Portable Radios  
**Bluetooth<sup>®</sup> Functionality**

TD-0016-04 • Issue 4 • August 2020

## Contact Information

### Tait Communications Corporate Head Office

Tait International Limited

P.O. Box 1645

Christchurch

New Zealand

For addresses and telephone numbers of regional offices, refer to <http://www.taitradio.com>.

## Copyright and Trademarks

All information contained in this document is the property of Tait International Limited. All rights reserved. This manual may not, in whole or in part, be copied, photocopied, reproduced, translated, stored, or reduced to any electronic medium or machine-readable form, without prior written permission from Tait International Limited.

The word Tait and the Tait logo are trademarks of Tait International Limited.

The Bluetooth<sup>®</sup> word mark and logos are registered trademarks owned by Bluetooth SIG, Inc, and any use of such marks by Tait International Limited is under license. Other trademarks and trade names referenced are the service mark, trademark or registered trademark of the respective manufacturers.

## Publication Information

While Tait has taken every care to ensure that the information and contents are correct and up-to-date at the time of publication, the information may contain technical inaccuracies and/or printing errors.

Tait does not guarantee the accuracy and correctness of the information. Tait cannot be held liable or responsible for errors or omissions in the contents of the technical documentation. All information contained in the technical documentation is given without any warranties or representations, expressed or implied.

.

## CONTENTS

Contact Information .....	2
1. INTRODUCTION.....	4
1.1 Purpose .....	4
1.2 Description of TP9300 Bluetooth Releases .....	4
1.3 Description of TP9400 Bluetooth Releases .....	4
1.4 Description of TP9500/TP9600 Bluetooth Releases.....	4
1.5 Publication Record .....	4
2. REQUIREMENTS .....	6
2.1 Radio Requirements.....	6
2.2 Bluetooth Device Requirements.....	6
2.3 Recommended Bluetooth Devices .....	6
2.4 Bluetooth Headsets Acceptance Test .....	6
3. PROGRAMMING AND OPERATION .....	7
3.1 TP9300/TP9400 and TP9500/TP9600 Radio Programming for Bluetooth .....	7
3.2 Pairing and Connecting .....	7
3.3 Disconnecting .....	8
3.4 PTT Audio Path Switching.....	8
3.4.1 <i>When a wired audio accessory is not connected to the radio</i> .....	8
3.4.2 <i>When a wired audio accessory is connected to the radio</i> .....	8
3.5 Bluetooth Device Volume Control .....	9

# 1. INTRODUCTION

## 1.1 Purpose

This document provides an overview of the Bluetooth functionality of the TP9300/TP9400/TP9500/TP9600 portable radios. It is not intended to be a complete description of the TP9300/TP9400/TP9500/TP9600 Bluetooth feature.

## 1.2 Description of TP9300 Bluetooth Releases

Bluetooth functionality in TP9300 was released in Firmware v1.02.00 in September 2013.

Additional support for wireless PTT with approved devices is available from version 2.20.04 onwards.

The Bluetooth version supported by the TP9300 TPD1 variant<sup>1</sup> is BT2.1. The Bluetooth version supported by the TP9300 TPD2 variant<sup>2</sup> is BT4.1.

## 1.3 Description of TP9400 Bluetooth Releases

Bluetooth functionality in TP9400 was released in Firmware v1.03.01 in July 2013.

Additional support for wireless PTT with approved devices is available from version 2.14.03 onwards.

The Bluetooth version supported by the TP9400 TPD1 variant<sup>1</sup> is BT2.1. The Bluetooth version supported by the TP9400 TPD2 variant<sup>2</sup> is BT4.1.

## 1.4 Description of TP9500/TP9600 Bluetooth Releases

Bluetooth and wireless PTT functionality in the TP9500 was released in Firmware v2.25 in December 2019.

Bluetooth and wireless PTT functionality in the TP9600 was released in Firmware v2.17 in December 2019.

The Bluetooth version supported by the TP9500 and TP9600 is BT4.2.

## 1.5 Publication Record

Issue	Document Status	Release Date
04	<ul style="list-style-type: none"> <li>Added TP9500/TP9600 information</li> <li>Added Bluetooth version information</li> <li>Added wireless PTT alternative</li> <li>Added Bluetooth button profiles to list of XPA actions</li> </ul>	August 2020

<sup>1</sup> TPD1 variants – the 3-way selector key is black, or not fitted

<sup>2</sup> TPD2 variants – the 3-way selector key is grey

Issue	Document Status	Release Date
03	<ul style="list-style-type: none"> <li>• Added TP9300 information from the now obsolete TD-0015</li> <li>• Summarised Bluetooth functions.</li> <li>• Updated recommended devices.</li> <li>• Removed repeated content.</li> </ul>	July 2019
02	<ul style="list-style-type: none"> <li>• Updated Section 2.3 Bluetooth Headset Requirements with respect to Bluetooth Core Specification 4.0+</li> <li>• Updated Section 2.5 regarding Bluetooth headset use-case and environment considerations</li> </ul>	September 2016
01	First release	6 June 2014

## 2. REQUIREMENTS

### 2.1 Radio Requirements

Bluetooth requires:

- TP9400 Firmware v1.03.01 or later\*; or
- TP9300 Firmware v1.02.00 or later\*; or
- TP9500 Firmware v2.25 or later; or
- TP9600 Firmware v2.17 or later; and
- TPAS082 (SFE Key - Bluetooth)
- Wireless PTT (optional)

\* The wireless PTT functionality in these radios may require them to be TPD2 variants, depending on the Bluetooth device. However, all the Bluetooth devices we list on our website and below, in Section 2.3, are supported by the TPD1 product variant.

### 2.2 Bluetooth Device Requirements

TP9300/TP9400 and TP9500/TP9600 Bluetooth supports commercially available Bluetooth devices with the following specifications:

- Must support HFP (Handsfree Profile) version 1.5 or 1.6 and/or HSP (Headset Profile) version 1.1 or 1.2
- For wireless PTT, only Tait approved devices can be used

Once a device is connected to a radio, the device and the radio are in active voice call mode until they are disconnected. The specified device talk time will give an indication of the shift life of the device when it is connected to a radio.

### 2.3 Recommended Bluetooth Devices

Many commercially available Bluetooth devices are compatible with TP9300/TP9400 and TP9500/TP9600 Bluetooth.

Tait recommends the following devices:

- Savox BTR-155 with wireless PTT function (TT0012-0002)
- AINA PTT Voice Responder with wireless buttons (TT0011-0001)  
**Note:** only the PTT key and a programmable function mapped to the orange key (emergency button) are currently supported by Tait radios.
- Savox BT-COM with wireless PTT function (TT0012-0001)

### 2.4 Bluetooth Headsets Acceptance Test

See the **Bluetooth Headset Test Guidelines** (TN-2817-AN) document for a simple set of tests that should be performed when selecting a headset or other Bluetooth device that has not been recommended by Tait.

## 3. PROGRAMMING AND OPERATION

### 3.1 TP9300/TP9400 and TP9500/TP9600 Radio Programming for Bluetooth

A radio must be programmed for Bluetooth operation.

The Bluetooth PTT can be a radio function key, a wired PTT connected to the radio accessory connector, or the PTT on a Bluetooth device.

If a wired audio accessory is to be connected to the radio accessory connector, then the Bluetooth PTT must be a radio function key, or a wireless PTT. If a radio is programmed for the Bluetooth PTT to be a wired PTT connected to the radio accessory connector, then a wired audio accessory connected to the radio accessory connector will not operate correctly.

Refer to the XPA Help for details on how to program the following actions:

- Using a radio function key as the Bluetooth PTT
- Using a wired PTT connected to the radio accessory connector as the Bluetooth PTT
- Using a wireless PTT
- Setting the radio to search for and connect to new devices
- Allowing the user to disconnect from the currently connected device
- Setting reconnection behaviour if connection is lost
- Setting power-on behaviour
- Setting up Bluetooth button profiles to customise wireless PTT function key usage

**Note:** TPAS082 (SFE Key – Bluetooth) must be enabled

### 3.2 Pairing and Connecting

Pairing is the process of establishing an initial connection between a radio and a Bluetooth device, or headset. Connecting is the process of establishing an audio connection between a paired radio and device. If necessary, the radio pairs and then connects to a device in one process.

A radio can maintain pairing with up to four devices. This can be beneficial, for example, to enable faster connecting to another device when the battery on the currently connected device goes flat. A radio can only connect to one device at a time.

Reprogramming a radio will erase the paired devices information from the radio.

See the Bluetooth device user's guide and **Using a wireless headset** in the relevant **User's Guide**:

- TP9300 User's Guide (MPD-00001-xx)
- TP9400 User's Guide (MPD-00003-xx)
- TP9500 User's Guide (MPG-00001-xx)
- TP9600 User's Guide (MPG-00002-xx)

### 3.3 Disconnecting

Disconnecting is the process of terminating an audio connection between a radio and a device. Once disconnected, the radio and the device remain paired.

For more information, refer to the relevant documentation, as listed above.

### 3.4 PTT Audio Path Switching

#### 3.4.1 When a wired audio accessory is not connected to the radio

When a wired audio accessory is not connected to the radio accessory connector, the audio path can be switched between the Bluetooth device and the radio using the Bluetooth PTT and the radio PTT.

The audio connection between the radio and the device is maintained during the switching of the audio path. This means that changing the audio path from the device to the radio does not terminate the audio connection, and changing the audio path from the radio to the device does not require an audio connection to be established.

- On connection, the audio path is switched to the device. This means that the device speaker(s) and microphone are enabled and the radio speaker and microphone are disabled. The Bluetooth PTT is used for transmitting.
- If the audio path is switched to the device, then pressing the radio PTT switches the audio path to the radio. This means that the device speaker(s) and microphone are disabled and the radio speaker and microphone are enabled. The radio PTT is then used for transmitting.

**Note:** If the radio speaker volume is low, then the radio user may not be able to hear audio from the radio speaker.

- If the audio path is switched to the radio, then pressing the Bluetooth PTT switches the audio path to the device. This means that the radio speaker and microphone are disabled and the device speaker(s) and microphone are enabled. The Bluetooth PTT is then used for transmitting.

#### 3.4.2 When a wired audio accessory is connected to the radio

When a wired audio accessory is connected to the radio accessory connector, the audio path can be switched between the Bluetooth device, the wired audio accessory and the radio using the Bluetooth PTT, the wired audio accessory PTT and the radio PTT.

When a wired audio accessory is connected to the radio accessory connector, the radio speaker is disabled.

The audio connection between the radio and the device is maintained during the switching of the audio path. This means that changing the audio path from the device to the wired audio accessory or to the radio does not terminate the audio connection, and changing the audio path from the wired audio accessory or from the radio to the device does not require an audio connection to be established.

- On connection, the audio path is switched to the device. This means that the device speaker(s) and microphone are enabled, the wired audio accessory speaker(s) and microphone are disabled and the radio microphone is disabled. The Bluetooth PTT is used for transmitting.
- If the audio path is switched to the device or to the radio, then pressing the wired audio accessory PTT switches the audio path to the wired audio accessory. This means that the device speaker(s) and microphone are disabled, or the radio microphone is disabled, and the wired audio accessory speaker(s) and microphone are enabled. The wired audio accessory PTT is then used for transmitting.

**Note:** If the wired audio accessory speaker(s) volume is low, then the radio user may not be able to hear audio from the wired audio accessory speaker(s).

- If the audio path is switched to the wired audio accessory or to the radio, then pressing the Bluetooth PTT switches the audio path to the device. This means that the wired audio accessory speaker(s) and microphone are disabled, or the radio microphone and the wired audio accessory speaker(s) are disabled, and the device speaker(s) and microphone are enabled. The Bluetooth PTT is then used for transmitting.
- If the audio path is switched to the device or to the wired audio accessory, then pressing the radio PTT switches the audio path to the radio. This means that the device speaker(s) and microphone are disabled, or the wired audio accessory microphone is disabled, and the radio microphone and the wired audio accessory speaker(s) are enabled. The radio PTT is then used for transmitting.

**Note:** If the wired audio accessory speaker(s) volume is low, then the radio user may not be able to hear audio from the wired audio accessory speaker(s).

### 3.5 Bluetooth Device Volume Control

The device speaker(s) volume is controlled by the device's volume control.

In TP9300/TP9400 radios, the radio's volume control does not control the device speaker(s) volume, but in TP9500/TP9600 radios, the radio volume control can control the device speaker(s) volume.