TP8100 Portables

Specifications Manual

MPC-00025-10 · Issue 10 · February 2014

www.taitradio.com

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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.

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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.

Contents

1 Introduction

This manual lists some of the regulatory requirements and industry standards that the TP8100 series of portable analog radios satisfy, and explains how the radio specifications were derived. Separate chapters compare the performance of the receiver (Section 2) and of the transmitter (Section 3) with requirements specified by the European Telecommunications Standards Institute (ETSI) and the Telecommunications Industry Association (TIA). Section 4 provides general radio, battery, and charger specifications, and lists compatible antennas and accessories.

Notice The TP8100 specifications in this manual are typical performance figures and are intended only to provide guidance. They are subject to change without notice and shall not form part of any contract. To establish whether the radio meets the regulatory requirements that apply to you, please contact your regional Tait office.

Notice For known issues and limitations that may cause a radio to perform outside the specifications listed here, see the software release notes for the TP8100. Software release notes are on the Tait Support website, http://support.taitradio.com.

Regulatory Requirements and Industry Standards

TP8100 radios meet and exceed **regulatory requirements** that include:

- 47CFR
- AS4295-2004
- EN 300 086-1[1]
- EN 300 113-1[1]
- EN 300 219-1[1]
- EN 301 489-1[1]
- EN 60950-1[1]
- RSS-119

[1] A regulatory requirement issued by ETSI.

TP8100 radios also meet and exceed **industry standards** that include TIA-603-C (reference ANSI/TIA-603-C-2004), a standard issued by TIA in accordance with American National Standards Institute (ANSI) patent policy.

For applicable Ingress Protection (IP) ratings and military standards, as well as details of the applicable Electrostatic Discharge (ESD) standard, see "Environmental" on page 23.

Test Methods

TP8100 transmitter and receiver performance was measured using the ETSI test method EN 300 086-1 and the ANSI/TIA test method TIA-603-C (see above). For adjacent channel selectivity only, the ANSI/TIA one-tone test method, TIA/EIA603, was used.

For more information about test methods or about conditions that apply to compliance testing in different countries, please contact Tait.

Performance Figures

TP8100 specifications were derived by measuring **typical performance** and then averaging that measurement across multiple points in each RF band.

In contrast, all figures quoted as regulatory requirements are **guaranteed minimum performance** figures for equipment operated at standard room temperature, +22°C to +28°C (+71.6°F to +82.4°F) and standard test voltage (7.5VDC).

Performance figures quoted as 'typical' are generally better than performance figures quoted as 'guaranteed minimum'.

Definition of NB, MB, and WB

The terms 'narrow bandwidth', 'medium bandwidth', and 'wide bandwidth' are used as follows:

Term	Abbreviation	Channel spacing	Modulation 100% deviation
Narrow bandwidth	NB	12.5kHz	±2.5kHz
Medium bandwidth	MB	20kHz/25kHz	±4kHz
Wide bandwidth	WB	25kHz	±5.0kHz

Frequency Bands

Tait uses a unique alpha-numeric code to represent each frequency band. Frequency codes currently used with the TP8100 series of radios include:

Frequency code	Frequency band
B1	136 MHz to 174 MHz
C0	174 MHz to 225 MHz
G2	350 MHz to 400 MHz
H5	400 MHz to 470 MHz
H6	450 MHz to 530 MHz
K6	806 MHz to 870 MHz (Tx) 850 MHz to 870 MHz (Rx)
L3	896 MHz to 941 MHz (Tx) 935 MHz to 941 MHz (Rx)

These codes are used throughout the manual.

FCC Narrowbanding Regulations

From 1 January 2013 it is an FCC requirement that land mobile radio systems imported into the USA must not operate channels with a bandwidth greater than 12.5 kHz in the 150–174 MHz and 421–470 MHz frequency bands.

The solution for other Tait terminals to support medium and wide bandwidth channels after January 2013 is by SFE Key TxAS083. This is not an option on the TP8100 platform, so two programming applications have been produced instead: one for customers in the USA and one for the rest of the world.

TP8100 Programming Application v2.15 will not allow medium or wide bandwidth channels to be programmed in the B1 (VHF) and H5/H6 (UHF) bands, except for the excluded frequencies. Other bands are unchanged.

TP8100 Programming Application v2.16 allows narrow, medium and wide bandwidth channels to be programmed across all frequencies, as per earlier versions of the programming application. This version is only available to customers located outside the USA.

Contact your regional Tait office for more information.

Associated Documentation

The following documents are provided on the TP8100 Product Support CD (IPN 406-00059-xx) where xx represents the issue number of the document:

Title	IPN/Item code
Safety and Compliance Information (multi-lingual)	MTA-00011-xx
Battery Safety Information (multi-lingual)	MPC-00006-xx
Battery Charging Guide (multi-lingual)	MPD-00002-xx
TP8110 Conventional Radios User's Guide	MPC-00026-xx
TP8115/TP8120 Conventional Radios User's Guide	MPC-00001-xx
TP8135/TP8140 MPT Trunked Radios User's Guide	MPC-00002-xx
TP8100 Service Manual	MPC-00003-xx

Always get the latest issue of a manual from the Tait Support website, http://support.taitradio.com. In addition to software release notes and the latest issue of a manual, useful downloads from the Support website include:

- Technical notes (TN), which provide technical details not yet in the manuals, or solve any problems that may have arisen.
- User documentation in Chinese, French, German, Italian, Portuguese, and Spanish.
- PCB Information documents for individual boards. Compare the information on the title page of the PCB Information document with the board in the radio. The 'Product Code' listed in the document must match the T03- number on the PCB board label; the 'BOM Revision' must match the 'R' (revision) number on the PCB board label, and the 'PCB Number' must match the Internal Part Number (IPN) imprinted on the printed circuit board. If any of these numbers do not match, please see the TP8100 Service Manual (MPC-00003-xx) for guidance.

Product Codes

The product code (T03-xxxxx-xxxx) printed on a radio label identifies both the radio model and the configuration of that particular radio. Item codes for accessories, antennas, batteries, chargers, and options boards are included in the relevant chapters, but this manual does not list all possible radio product codes. For a detailed explanation of product codes and how to interpret them, please refer to the TP8100 Service Manual (MPC-00003-xx).

Publication Record

Issue	Date	Description
1	December 2007	First release
2	January 2008	Added H6 Rx specifications and removed 'ETSI approval pending'
3	August 2008	Added C0 band, general radio, battery, and charger specifications, compatible antennas and accessories
4	April 2009	Added K6 and L3 bands, Man down and Encryption options boards, 2500mAh Li-ion performance battery, current consumption and shift life
5	May 2009	Edited Rx sensitivity (TIA-603-C test method)
6	July 2009	Added G2 specifications and antennas, added batteries size and weight, fixed antenna heights TPA-AN-024/5 (TIMS 76405), updated TP8110/8115/8120 decode/ encode. 'Tait Internal Release Only'
7	December 2010	Added Electrostatic Discharge standard IEC 61000-4-2 Added details about PCB Information documents Added Intrinsically Safe (IS) radios, batteries, and accessories (TIMS 80516) Updated list of antennas (TIMS 82912, 80508) Added battery safe operating temperature range, and battery safe charging temperature range (TIMS 80516) Updated list of accessories (including TIMS 80505,TIMS 85655) Updated encryption requirements Added colored front panels Updated Tait website details (TIMS 84167)
8	March 2011	Added Blocking specification (TIMS 86311) Removed TPK-AA-40x firefighting accessories
9	March 2012	Updated list of antennas (TIMS 94015)
10	February 2014	Updated list of antennas (TIMS 102883)

2 Receiver Specifications

This chapter compares the performance of the receiver in a TP8100 radio with receiver requirements specified by ETSI and TIA.

Where the ETSI test method EN 300 086-1 was used to measure TP8100 performance, no test method is named. Where an ANSI/TIA test method was used, the test method is identified in parentheses. Sensitivity, distortion, and signal-to-noise figures are for standard operating conditions that include audio de-emphasis. Please see also the footnotes to the table.

> **Notice** The TP8100 specifications in this manual are typical performance figures that are intended only to provide guidance. They are subject to change without notice and shall not form part of any contract. To establish whether the radio meets the regulatory requirements that apply to you, please contact your regional Tait office.

For important information about how radio performance figures were derived, see Chapter 1 Introduction.

Parameter	Compliance limit	Measured performance						
	All bands	**B1[1]**	**C0**	**G2**	**H5**	**H6**	**K6**	**L3**
Adjacent channel selectivity								
NB channel[2]	> 60 dB	67.4 dB	68 dB	65.8 dB	67.7 dB	65.4 dB	not required	
MB channel	> 70 dB	72.9 dB	70.5 dB	71.3 dB	73.8 dB	72.2 dB		
WB channel	> 70 dB	76.4 dB	72 dB	76.7 dB	76.1 dB	75.1 dB		
Adjacent channel selectivity (TIA/EIA603 one-tone test method)								
NB channel	> 50 dB	68.0 dB	68.44 dB	66.7 dB	67.0 dB	65.2 dB	64.6 dB	64.3 dB
MB channel	> 60 dB	73.5 dB	70.6 dB	70.7 dB	73.1 dB	71.9 dB	72.2 dB	72.4 dB
WB channel	> 60 dB	76.4 dB	72.48 dB	74.6 dB	73.5 dB	74.5 dB	75.8 dB	73.3 dB
Audio distortion at rated audio[3]								
	< 5%	2%	2.3%	1.5%	3.2%	3.5%	1.5%	2.2%
Audio response[3]								
	+1 dB, –3 dB	+0.5 dB, –2.5 dB						
Adjacent channel selectivity								
NB channel[2]	> 60 dB	67.4 dB	68 dB	65.8 dB	67.7 dB	65.4 dB	not required	
MB channel	> 70 dB	72.9 dB	70.5 dB	71.3 dB	73.8 dB	72.2 dB		
WB channel	> 70 dB	76.4 dB	72 dB	76.7 dB	76.1 dB	75.1 dB		
Blocking								
	> 84 dB	>96 dB					not required	
Frequency stability (TIA-603-C test method)								
	±2.5 ppm	±2.0 ppm	±2.0 ppm	±2.0 ppm	±2.0 ppm	±2.0 ppm	±1.5 ppm	±1.5 ppm
Intermodulation rejection								
NB channel	> 65 dB	67.6 dB	66.3 dB	67.4 dB	67.4 dB	67.4 dB	not required	
MB channel	> 65 dB	68.6 dB	67.3 dB	67.9 dB	67.9 dB	68.3 dB		
WB channel	> 65 dB	68.7 dB	66.9 dB	68.5 dB	68.1 dB	68.4 dB		
Intermodulation rejection (TIA-603-C test method)								
NB channel	> 70 dB	74.3 dB	72.8 dB	74.9 dB	73.5 dB	74.3 dB	75.3 dB	75.4 dB
MB channel	> 70 dB	75.4 dB	71.2 dB	75.1 dB	74.8 dB	75.4 dB	75.8 dB	76 dB
WB channel	> 70 dB	75.4 dB	74.1 dB	75.4 dB	75.1 dB	75.8 dB	78.2 dB	77.1 dB
Rated audio[3]								
		0.5 W into external 16 Ω load						

Parameter	Compliance limit	Measured performance (continued)						
	All bands	**B1**[1]	**C0**	**G2**	**H5**	**H6**	**K6**	**L3**
Sensitivity[4]								
NB channel	< –112 dBm	–113.5 dBm	–115.2 dBm	–116.2 dBm	–115.5 dBm	–115.3 dBm	not required	
MB channel	< –112 dBm	–117.0 dBm	–116.6 dBm	–118.5 dBm	–117.8 dBm	–118.0 dBm		
WB channel	< –112 dBm	–117.0 dBm	–118 dBm	–119.3 dBm	–118.4 dBm	–118.4 dBm		
Sensitivity[5] (TIA-603-C test method)								
NB channel	< –118 dBm (0.25 µV)	–119.5 dBm	–119.3 dBm	–120.4 dBm	–119.4 dBm	–119.7 dBm	–120.1 dBm	–119.3 dBm
WB channel	< –118 dBm (0.25 µV)	–119.5 dBm	–119.2 dBm	–120.3 dBm	–119.4 dBm	–119.6 dBm	–120.5 dBm	–119.3 dBm
Spurious response rejection								
NB channel	> 70 dB	71.9 dB	75.5 dB[6]	77.4 dB	71.8 dB	71.4 dB	not required	
WB channel	> 70 dB	75.9 dB	77.2 dB	77.8 dB	72.7 dB	72.5 dB		
Spurious response rejection (TIA-603-C test method)								
NB channel	> 65 dB	not required					> 66.1 dB[7]	> 76.7 dB
WB channel	> 65 dB						> 66.9 dB[7]	> 76.7 dB

[1] See "Frequency Bands" on page 8.

[2] See "Definition of NB, MB, and WB" on page 7.

[3] EN 300 086-1 and TIA-603-C test methods.

[4] 20 dB SINAD phosphometric weighting.

[5] 12 dB SINAD.

[6] Based on minimum ½ IF rejection of a typical C0 radio.

[7] Values recorded when spurious response rejection is measured across the whole band. In the range 850–865 MHz, spurious response rejection is >75 dB. In the range 865–870 MHz, it is >65 dB.

3 Transmitter Specifications

This chapter compares the performance of the transmitter in a TP8100 radio with transmitter requirements specified by ETSI and TIA.

The TP8100 satisfies the Electronics Industries Alliance (EIA) requirements for F3E and F2D emissions.

Where the ANSI/TIA test method TIA-603-C was used to measure TP8100 performance, this is indicated in parentheses. Where the ETSI test method EN 300 086-1 was used, no test method is named. Please see also the footnotes to the table.

> **Notice** The TP8100 specifications in this manual are typical performance figures that are intended only to provide guidance. They are subject to change without notice and shall not form part of any contract. To establish whether the radio meets the regulatory requirements that apply to you, please contact your regional Tait office.

For important information about how radio performance figures were derived, see Chapter 1 Introduction.

Parameter	Compliance limit	Measured performance						
	All bands	**B1[1]**	**C0**	**G2**	**H5**	**H6**	**K6**	**L3**
Audio distortion at 1 kHz with 60% modulation[2]								
	< 2%	0.3%	0.3%	0.6%	0.5%	0.5%	0.5%	0.5%
Audio response[2]								
	+1 dB, –3 dB	+0.5 dB, –2.5 dB						
Conducted emissions								
< 1 GHz	< –36 dBm	–39 dBm	–46 dBm	–46 dBm	–40.6 dBm	–39 dBm	not required	not required
> 1 GHz	< –30 dBm	–46 dBm	–40 dBm	–40 dBm	–40.0 dBm	–40 dBm		
Conducted emissions (TIA-603-C test method)								
	< –13 dBm	–39 dBm	–40 dBm	–40 dBm	–38 dBm	–38 dBm	–33 dBm	–33 dBm
FM hum and noise (TIA-603-C test method)								
NB channel[3]	> 34 dB	40 dB	42 dB	42 dB	37 dB	37 dB	39 dB	40 dB
MB channel	> 38 dB	44 dB	45 dB	44 dB	41 dB	41 dB	44 dB	44 dB
WB channel	> 40 dB	46 dB	47 dB	46 dB	43 dB	43 dB	45 dB	46 dB
Modulation limiting[2]								
NB channel	±2.5 kHz	±2.2 kHz						
MB channel	±4.0 kHz	±3.8 kHz						
WB channel	±5.0 kHz	±4.4 kHz						
Radiated emissions								
<1 GHz	< –36 dBm	–38.7 dBm	–43 dBm	–38 dBm	–37.9 dBm	–45.0 dBm	not required	
>1 GHz	< –30 dBm	–46.0 dBm	–40 dBm	–34 dBm	–34.0 dBm	–45.0 dBm		
Radiated emissions (TIA-603-C test method)								
	< –13 dBm	–38.7 dB	–40 dBm	–38 dBm	–38 dBm	–23.5 dBm	–23 dBm	–23 dBm
RF power output[2]								
High	not required	5 W	5 W	4 W	4 W	4 W	3 W	3 W
Medium		2.5 W	2.5 W	2.5 W	2.5 W	2.5 W	2 W	2 W
Low		1 W	1 W	1 W	1 W	1 W	1 W	1 W

[1] See "Frequency Bands" on page 8.

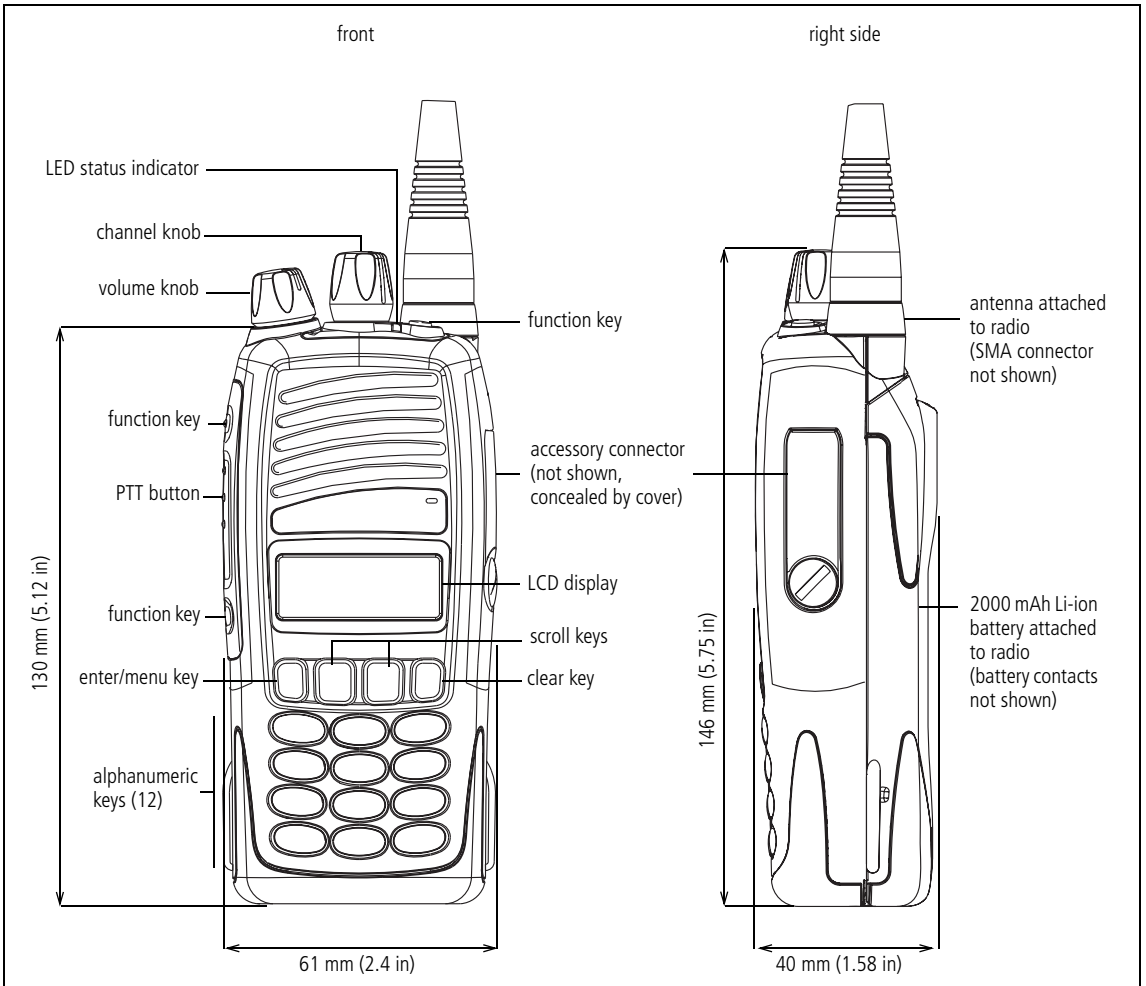
[2] EN 300 086-1 and TIA-603-C test methods.

[3] See "Definition of NB, MB, and WB" on page 7.

4 General Specifications

This chapter provides general specifications for the TP8100 series of portable radios, and for the batteries and chargers used with them. It identifies compatible antennas and accessories, and includes important information about Intrinsically Safe (IS) radio systems.

Figure 4.1 TP8120/TP8140 (16-key radio) dimensions and user interface



For dimensions when a 2500 mAh Li-ion battery is attached, see "Battery Size, Weight, and Finish" on page 27.

Intrinsically Safe (IS) Radios, Batteries, and Accessories

Intrinsically Safe (IS) radios, batteries, and accessories are certified by a third party, Factory Mutual Corporation (FM), to be safe for use in particular hazardous locations.

Warning **Fit only an IS-approved battery and IS-approved accessories to an IS-approved TP8100 radio. Fitting a battery or accessory that is not IS-approved exposes the radio user to a risk of explosion which could cause serious injury or death. Any unauthorized repair to an IS radio, battery, or accessory, or any substitution of non-IS parts, will invalidate both the Intrinsic Safety rating and the third-party IS approval. Fit only one of the antennas that is listed under "Antennas" on page 31.**

Warning **If the accessory or battery used with an Intrinsically Safe TP8100 radio has a lower IS rating than the radio does, the IS rating that will apply to the radio system is the lowest IS rating of any component in that radio system.**

Warning **Do not retrofit an Encryption options board or a Man Down options board to an Intrinsically Safe (IS) TP8100 radio unless specifically certified to do so by both Tait and the relevant Intrinsic Safety approval authority.**

Identifying an IS Radio or Battery

Any of the following marks identifies a TP8100 Intrinsically Safe radio or battery:

IS item	Location of mark	Identifying mark
Radio	Front panel of radio	IS circle logo (IS)
	Yellow label on radio chassis	IS information - and - Factory Mutual logo (FM APPROVED)
Battery	Yellow label on battery	

A TP8100 radio or battery that is certified Intrinsically Safe has a ‘2’ in the product code, in the position

T03-2nnnn-XXXX

Compliance Ratings

Intrinsically Safe TP8100 radios are approved by Factory Mutual Corporation (FM) to the following ratings:

- IS / I, II, III / 1 / CDEFG / T4, Ta=40°C; IP67
- NI / I / 2 / ABCD / T4, Ta=40°C
- S / II, III / EFG; IP67

IS-approved Accessories

Warning **If the accessory or battery used with an Intrinsically Safe TP8100 radio has a lower IS rating than the radio does, the IS rating that will apply to the radio system is the lowest IS rating of any component in that radio system.**

Notice No accessory with the order code TPA-AA-xxx is certified Intrinsically Safe for use with a TP8100 radio. An accessory is given IS approval for use with a specific product. An accessory that is certified Intrinsically Safe for use with one product may not have IS approval for use with another product.

The following communication accessories can be used with an Intrinsically Safe TP8100 radio, but are suitable for IS / I / 1 / CD, and NI / I / 2 / CD applications only.

- TPK-AA-101 heavy duty speaker microphone (MIL-STD) with volume control and programmable button
- T952-051 in-ear earphone

For a list of antennas that can be used with an Intrinsically Safe TP8100 radio, see "Antennas" on page 31.

For details of Intrinsically Safe batteries, see "IS-approved Batteries" on page 20.

For more information about IS-approved accessories, please contact your regional Tait office.

IS-approved Batteries

Warning **Fit only an IS-approved battery to an IS-approved TP8100 radio. Fitting a battery that is not IS-approved exposes the radio user to a risk of explosion which could cause serious injury or death.**

The 2000mAh Li-ion battery (TPK-BA-12x/T03-20011-AAAA) is certified Intrinsically Safe for use with an Intrinsically Safe TP8100 radio.

Radio Specifications

This section lists general radio specifications.

- For radio compliance specifications, see "Regulatory Requirements and Industry Standards" on page 6.
- For receiver performance specifications, see Chapter 2 Receiver Specifications.
- For transmitter performance specifications, see Chapter 3 Transmitter Specifications.

The product code printed on the radio label identifies both the radio model and the configuration of that particular radio. For an explanation of product codes, please refer to the TP8100 Service Manual (MPC-00003-xx).

User Interface

	TP8110	TP8115/TP8135	TP8120/TP8140
Connectors Accessory connector Battery contacts Antenna connector	Standard interface for compatible accessories, on the right side[1] of the front panel; when not in use, the nine contacts are protected by a plastic cover (the cover should remain on the radio when the connector is not in use) Two self-cleaning swipe contacts on the rear panel Stainless steel SMA connector		
Display	–	24-character backlit LCD screen, menu driven	
Function keys	Three programmable keys: two silicon rubber keys on the left[1] of the front panel and a colored key, sometimes called the 'emergency key', on the top		
Keypad	–	Two scroll keys, an enter/ menu key, and a clear key	Two scroll keys, an enter/ menu key, and a clear key; 12 alpha-numeric keys
Knobs Channel knob Volume knob	Textured rubber knob Angled and textured rubber knob		
LED status indicator	Clear lens that can be lit green, amber, or red		
Press To Talk (PTT) button	Large silicon rubber button, with three raised dimples, on the left[1] of the front panel		
Speaker-microphone	Combined speaker and microphone inside front panel; speaker with 8Ω impedance		

[1] For the location of the keys, see Figure 4.1on page 17.

Radio Size, Weight, and Finish

	Radio with 2000 mAh battery	Radio with 2500 mAh battery	Radio with 2000 mAh Intrinsically Safe battery
Size (WxH[1]xD)	2.4in x 5.12in x 1.58in (61mm x 130mm x 40mm)	2.4in x 5.12in x 1.77in (61mm x 130mm x 45mm)	
Weight[2]	12.13oz (344g)	13.76oz (390g)	12.84oz (364g)
Finish, body	Two-shot moulded construction, easy grip, with toughened rubber armor corners The front panel is available in black, yellow, orange, or red		

[1] Height measured to base of channel knob.

[2] Includes TPA-AN-001 (136-225MHz). For battery dimensions see "Battery Specifications" on page 27.

Environmental

<table>
<tr><td>Operating temperature

Operating temperature, Intrinsically Safe</td><td colspan="3">–30°C to +60°C (–22°F to +140°F)

–20 °C to +40 °C (–4 °F to +104 °F)</td></tr>
<tr><td>Ingress Protection (IP) rating</td><td colspan="3">IP67 and IP65</td></tr>
<tr><td>Electrostatic Discharge (ESD) standard</td><td colspan="3">International Electrotechnical Commission (IEC) 61000-4-2</td></tr>
<tr><td rowspan="12">Military standard (MIL-STD)</td><td colspan="3">MIL-STD-810F[1]</td></tr>
<tr><td></td><td>Method</td><td>Procedure</td></tr>
<tr><td>Low pressure</td><td>500.4</td><td>2</td></tr>
<tr><td>High temperature</td><td>501.4</td><td>1 and 2</td></tr>
<tr><td>Low temperature</td><td>502.4</td><td>1 and 2</td></tr>
<tr><td>Temperature shock</td><td>503.4</td><td>1</td></tr>
<tr><td>Solar radiation</td><td>505.4</td><td>1</td></tr>
<tr><td>Rain</td><td>506.4</td><td>1 and 3</td></tr>
<tr><td>Humidity</td><td>507.4</td><td>1</td></tr>
<tr><td>Salt fog</td><td>509.4</td><td>1</td></tr>
<tr><td>Dust</td><td>510.4</td><td>1</td></tr>
<tr><td>Vibration</td><td>514.5</td><td>1 (Category 24)</td></tr>
<tr><td>Shock</td><td>516.5</td><td>1 and 4</td></tr>
</table>

[1] The TP8100 also meets the equivalent superseded standards MIL-STD-810C, D, and E.

See also "Regulatory Requirements and Industry Standards" on page 6.

Frequencies and Channels

	B1	C0	G2	H5	H6	K6	L3
Frequency increments							
	2.5kHz, 5kHz, 6.25kHz		5kHz, 6.25kHz				
Channel spacing							
Narrow band Medium band Wide band	12.5kHz 20kHz/25kHz 25kHz						
Frequency range (MHz)							
	136–174	174–225	350–400	400–470	450–530	Tx 806–870 Rx 850–870	Tx 896–941 Rx 935–941
Frequency stability, see Chapter 2 Receiver Specifications							
IF bandwidth							
Narrow band Medium band Wide band	9kHz 15kHz 15kHz						
RF power output							
High Medium Low	5W 2.5W 1W	5W 2.5W 1W	4W 2.5W 1W	4W 2.5W 1W	4W 2.5W 1W	3W 2W 1W	3W 2W 1W

Signaling and Modes

	Conventional (TP8110, TP8115, TP8120)	Trunked (TP8135, TP8140)
2-tone signaling format	✔ Decode only	
CTCSS signaling format	✔	✔
DCS signaling format	✔	✔ Conventional channels only
DTMF signaling format	Encode only	TP8135: Not available TP8140: Direct entry encode only

(continues on next page)

	Conventional (TP8110, TP8115, TP8120)	Trunked (TP8135, TP8140)
Economy mode	✔	
Encryption/Rolling-code voice scrambler Requires: ■ Encryption options board (TPK-OP-101/ T03-00114-AAAA; Midian name'TVS2-2-TP8 High Level Hopping Code Scrambler for Tait TP-8100') ■ And, if using custom codes: Encryption module programming adapter (TPK-SV-008) Do not retrofit an Encryption options board to an Intrinsically Safe (IS) TP8100 radio unless specifically certified to do so by both Tait and the relevant Intrinsic Safety approval authority.	✔	✔
GE-Star signaling format, also called G-Star	✔ Encode only	
Lone Worker inactivity detection	✔	✔
Man down, an additional Lone Worker feature Requires Man down options board (TPK-OP-100/ T03-00116-AAAA) Do not retrofit a Man Down options board to an Intrinsically Safe (IS) TP8100 radio unless specifically certified to do so by both Tait and the relevant Intrinsic Safety approval authority.	✔	✔
MDC1200 signaling format	✔ TP8110: Encode only	
Messaging capabilities	✔ TP8115 and TP8120: Predefined status messaging TP8120: Predefined Short Data Messages (SDMs) and user-entered SDMs	✔ TP8135 and TP8140: Predefined status messaging TP8140: Predefined Short Data Messages (SDMs) and user-entered SDMs
MPT 1327 signaling format including multiple call types (individual, group, PABX, interfleet, and short data messages)		✔
Presets	TP8110: 16 channels TP8115: 128 channels TP8120: 350 channels	100 alphanumeric presets (10 channels conventional)
Selcall signaling format	✔	
Voting/scanning	✔	

Current Consumption

	B1	C0	G2	H5	H6	K6	L3
Current consumption							
Standby, Economy mode	33mA	34mA	35mA	35mA	37mA	36mA	32mA
Standby, standard mode	47mA	49mA	53mA	52mA	53mA	58mA	56mA
Receiver squelched	51mA	54mA	56mA	56mA	57mA	62mA	60mA
Receiver	170mA	172mA	180mA	176mA	180mA	183mA	173mA
Transmitter current							
Low power	0.7A	0.7A	0.8A	0.7A	0.8A	0.7A	0.7A
Medium power	1A	1A	1.1A	1A	1A	1A	1A
High power	1.5A	1.5A	1.5A	1.5A	1.5A	1.2A	1.2A

Current consumption was tested using conventional radios equipped with the latest radio hardware. All measurements were made in the middle frequencies of each band. Battery voltage was 7.5V, and radios transmitted into a 50Ω load.

In standard mode, there is no difference in current consumption between a conventional TP8100 radio and a trunked TP8100 radio. The addition of an options board (Man Down or Encryption) to the radio does not significantly increase the drain on the battery.

Battery Specifications

Observe all safety precautions that relate to the handling of Li-ion batteries.

Warning **LI-ION BATTERY. This radio uses 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 in the TP8100/TP9100 Li-ion Battery Safety Information document (MPC-00006-xx). The document is on the TP8100 Product Support CD and on the Tait Technical Support website, http://support.taitradio.com.**

Warning **LI-ION BATTERY. Do not allow anything to obstruct the vent hole in the battery. If the battery vent is obstructed, the battery may explode, causing personal injury and/or damage to property. Make sure that no customized label attached to the battery or radio will obstruct the battery vent hole.**

Warning **Fit only an IS-approved battery to an IS-approved TP8100 radio. Fitting a battery that is not IS-approved exposes the radio user to a risk of explosion which could cause serious injury or death. See "IS-approved Batteries" on page 20.**

Battery Size, Weight, and Finish

	2000 mAh 'standard' T03-00011-Axxx	2500mAh 'performance' T03-00011-Cxxx	2000mAh Intrinsically Safe T03-20011-Axxx
Size (WxHxD)	2.4in x 4.7in x 0.7in (61mm x 118mm x 17mm)	2.4in x 4.7in x 0.8in (61mm x 118mm x 21mm)	
Weight	4.6oz (130g)	6.2 oz (175g)	5.3 oz (150g)
Finish	Two-shot moulded construction, with toughened rubber armor corners		

Expected Shift Life

The following table shows the expected shift life for a fully charged, healthy Li-ion battery when the radio is used in standard mode, and when the radio is used in Economy mode. The figures assume that the battery has been subjected to typical use at 25 °C (77 °F) for one year, with approximately 300 charge and discharge cycles. The correct antenna is being used and backlighting is off.

Notice To maximize battery life and performance, and to charge batteries correctly, follow the instructions provided in the TP8100/TP9100 Battery Charging Guide (MPC-00005-xx) supplied with the charger.

	2000 mAh 'standard' T03-00011-Axxx	**2500 mAh 'performance' T03-00011-Cxxx**	**2000 mAh Intrinsically Safe T03-20011-Axxx**
Standard mode[1]			
Duty cycle 5 / 5 / 90[2]	11.1 hours	14.2 hours	11.1 hours
Duty cycle 5 / 35 / 60[3]	8.4 hours	10.7 hours	8.4 hours
Economy mode[1]			
Duty cycle 5 / 5 / 90	12.3 hours	15.7 hours	12.3 hours
Duty cycle 5 / 35 / 60	8.8 hours	11.3 hours	8.8 hours

[1] Standard mode is available in conventional and trunked radios. Economy mode is available in conventional radios only.

[2] 5% transmitting, 5% receiving, 90% standby.

[3] 5% transmitting, 35% receiving, 60% standby.

In standard mode, there is no difference in current consumption between a conventional TP8100 radio and a trunked TP8100 radio. The addition of an options board (Man Down or Encryption) to the radio does not significantly increase the drain on the battery.

Safe Temperature Range for Charging and Operating

	2000 mAh 'standard' T03-00011-Axxx	**2500 mAh 'performance' T03-00011-Cxxx**	**2000 mAh Intrinsically Safe T03-20011-Axxx**
Safe operating temperature range	–30 °C to +60 °C (–22 °F to +140 °F)		–20 °C to +40 °C (–4 °F to +104 °F)
Safe charging temperature range	+5 °C to +40 °C (+41 °F to +104 °F)		

Battery Charger Specifications

Use only a TP8100 multicharger (TPK-CH-15x/T03-00013-AAAA) or a TP8100 desktop charger (TPK-CH-10x/T03-00012-AAAA, sometimes called a 'single fast charger') to charge a TP8100 battery.

Notice To maximize battery life and performance, and to charge batteries correctly, follow the instructions provided in the TP8100/TP9100 Battery Charging Guide (MPC-00005-xx) supplied with the charger.

Notice If the radio is attached to the battery while the battery is being charged, the radio must be switched off.

Battery Type

Use the single desktop battery charger or the six-way multicharger to charge TP8100 Li-ion batteries. See also "Power Adapters" and "Mains Cables" below.

The order code and product code are both displayed on the charger.

Charge Temperature

A Li-ion battery will charge correctly only when the temperature of the battery and the charger is between +5°C (+41°F) and +40°C (+104°F).

Charge Time

	2000mAh 'standard' T03-00011-Axxx	**2500mAh 'performance' T03-00011-Cxxx**	**2000mAh Intrinsically Safe T03-20011-Axxx**
Typical time to full charge	1.5 hours to 2 hours	2 hours to 2.5 hours	1.5 hours to 2 hours
Maximum time to full charge	2.5 hours	3 hours	2.5 hours

LED Indicators

Both types of charger display a red LED when the battery is charging, a green LED when the battery is fully charged, and an amber LED if there is a problem.

Power Adapters

The following region-specific power adapters are available for use with the desktop charger (TPK-CH-10x/T03-00012-AAAA).

Destination	Power adapter	Desktop charger (supplied with power adapter)	
		Order code	Product code
Australia/New Zealand	009-00014-00	TPK-CH-101	T03-00012-A**B**AA
Europe	009-00016-00	TPK-CH-103	T03-00012-A**D**AA
United Kingdom	009-00015-00	TPK-CH-102	T03-00012-A**C**AA
USA and Canada	009-00017-00	TPK-CH-104	T03-00012-A**E**AA

Mains Cables

The following region-specific mains cables are available for use with the multicharger (TPK-CH-15x/T03-00013-AAAA).

Destination	Mains cable	Multicharger (supplied with mains cable and wall-mounting kit TPA-CH-012)	
		Order code	Product code
Australia/New Zealand	T952-310	TPK-CH-151	T03-00013-A**B**AA
Europe	T952-330	TPK-CH-153	T03-00013-A**D**AA
United Kingdom	T952-320	TPK-CH-152	T03-00013-A**C**AA
USA and Canada	T952-340	TPK-CH-154	T03-00013-A**E**AA

Antennas

The antennas listed below are suitable for use with the TP8100 series of portable radios, including TP8100 radios that are certified Intrinsically Safe (IS).

Warning **Do not fit an antenna to an IS-approved TP8100 radio unless the antenna is listed below and is supplied by Tait. Fitting any other antenna exposes the radio user to a risk of explosion which could cause serious injury or death. See also "Intrinsically Safe (IS) Radios, Batteries, and Accessories" on page 18.**

Notice The frequency band and channels that a radio uses determine which antenna should be used with the radio.

VHF/ UHF	Description	Order code	Frequency band[1]	Length (approx.)	Dot color[2]
VHF	TP8100/TP9100 antenna 136–151 MHz helical	TPA-AN-002	low B1	183 mm ±10 mm	black
	TP8100/TP9100 antenna 150–162 MHz helical	TPA-AN-003	mid B1	170 mm ±10 mm	black
	TP8100/TP9100 antenna 162–174 MHz helical	TPA-AN-004	high B1	155 ±10 mm	black
	TP8100/TP9100 VHF antenna selection kit[3]	TPA-AN-005	B1	various	n/a
	TP8100/TP9100 antenna 136-225 MHz tunable[4]	TPA-AN-001	B1 or C0	186 mm ±5 mm	black
UHF	TP8100 antenna 350–400 MHz helical	TPA-AN-017	G2	88 mm ±6.5 mm	yellow
	TP8100 antenna 350–400 MHz whip	TPA-AN-018	G2	188 mm ±3 mm	yellow
	TP8100 antenna 340–390 MHz helical	TPA-AN-019	G2 custom	90 mm ±6.5 mm	red
	TP8100/TP9100 antenna 380–420 MHz whip	TPA-AN-010	H4	181 mm ±3 mm	violet
	TP8100/TP9100 antenna 380–420 MHz helical	TPA-AN-027	H4	79 mm ±6.5 mm	violet

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VHF/ UHF	Description	Order code	Frequency band[1]	Length (approx.)	Dot color[2]
UHF	TP8100/TP9100 antenna 400–470MHz helical	TPA-AN-013	H5	74mm ±6.5mm	brown
	TP8100/TP9100 antenna 400–470MHz whip	TPA-AN-011	H5	160mm ±3mm	brown
	TP8100/TP9100 UHF antenna selection kit[5]	TPA-AN-016	H5 or H6	various	n/a
	TP8100/TP9100 antenna 450–520MHz helical	TPA-AN-015	H6	67mm ±6.5mm	green
	TP8100/TP9100 antenna 450–520MHz whip	TPA-AN-012	H6	135mm ±3mm	green
	TP8100/TP9100 antenna 762-870MHz 1/2 wave whip	TPA-AN-022	K6	180mm	n/a
	TP8100 antenna 762–870MHz helical	TPA-AN-028	K6	68mm ±6.5mm	blue
	TP8100/TP9100 antenna 896-941MHz 1/4 wave whip	TPA-AN-024	L3	85 mm ±3mm	white
	TP8100/TP9100 antenna 896-941MHz 1/2 wave whip	TPA-AN-025	L3	175mm	n/a
	TP8100 antenna 896–941MHz helical	TPA-AN-029	L3	59mm ±6.5mm	white

[1] See "Frequency Bands" on page 8.

[2] Some TP8100 antennas have a colored dot on top, others—here marked 'n/a' (not applicable)—do not. The color of the dot indicates which frequencies the antenna is suitable for. For example, untuned antennas have a black dot and custom antennas have a red dot.

[3] This kit contains one each of the VHF antennas TPA-AN-002, -003, and -004.

[4] Trim this antenna to tune it to the required frequency. A cutting chart is supplied with the antenna.

[5] This kit contains one each of the UHF antennas TPA-AN-011, -012, -013, and -015.

Accessories

The accessories listed below are compatible with the TP8100 series of portable radios. To order an accessory, quote the order code.

Warning **Fit only an IS-approved accessory to an IS-approved radio. Fitting an accessory that is not IS-approved exposes the radio user to a risk of explosion which could cause serious injury or death. See "Intrinsically Safe (IS) Radios, Batteries, and Accessories".**

Many accessories connect directly to the accessory connector on the right side of the TP8100 radio. If an additional adapter is required, this is indicated.

Item	Order code
Accessory connectors and adapters	
7.5mm (0.3in) Accessory adapter	TPK-AA-002B
Accessory connector kit	TPB-AA-005
Audio accessory adapter Hirose 6-pin	TPK-AA-001
Antennas, see "Antennas" on page 31	
Batteries, see "Battery Specifications" on page 27	
Battery chargers, see "Battery Charger Specifications" on page 29	
Battery belt clip, 55 mm (2.17 in)	TPA-CA-201
Belt clip adapter used with 55 mm (2.17 in) belt clip	TPA-CA-208
Belt loop	
55mm (2.17in)	TPA-CA-206
75mm (3in)	TPA-CA-207
Carry cases	
Heavy duty leather 16-key window	TPK-CA-101
Heavy duty leather 4-key window	TPK-CA-100

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Item	Order code
Nylon 16-key with belt loop	TPK-CA-123
Nylon 16-key with D-clip belt loop	TPK-CA-125
Nylon 4-key with belt loop	TPK-CA-122
Nylon 4-key with D-clip belt loop	TPK-CA-124
Soft leather 16-key window for use with battery belt clip	TPK-CA-111
Soft leather 4-key window for use with battery belt clip	TPK-CA-110
Earpieces	
Earhanger 2.5 mm (0.1 in) jack	T952-055
Ear-hook 2.5 mm (0.1 in) right-angled jack	TPK-AA-252
Ear-hook transparent high volume 2.5 mm (0.1 in) right-angled jack	TPK-AA-253
Ear-hook 3.5 mm (0.14 in) right-angled jack	TPK-AA-242
Ear-hook transparent high volume 3.5 mm (0.14 in) right-angled jack	TPK-AA-243
2-wire earphone around ear with combined lapel microphone/PTT	TPB-AA-203
2-wire earphone in-ear with combined lapel microphone/PTT	TPB-AA-204
2-wire earphone in-ear with combined palm microphone/PTT Requires TP8100 audio accessory adapter Hirose 6-pin TPK-AA-001	TPA-AA-221[1]
2-wire earphone in-ear with combined palm microphone/PTT Requires TP8100 audio accessory adapter Hirose 6-pin TPK-AA-001	TPA-AA-222
3-wire earphone in-ear with lapel microphone and palm PTT Requires TP8100 audio accessory adapter Hirose 6-pin TPK-AA-001	TPA-AA-213[1]
Earphone around ear with boom microphone and finger PTT	TPB-AA-201
Earphone in-ear 2.5 mm (0.1 in) jack ISFM	T952-051[2]
Earphone transparent D-ring high volume 2.5 mm (0.1 in) jack	TPK-AA-254
Earphone transparent D-ring high volume 3.5 mm (0.14 in) right-angled jack	TPK-AA-244
Eartube ear-hook 2.5 mm (0.1 in) right-angled jack	TPK-AA-251
Eartube ear-hook 3.5 mm (0.14 in) right-angled jack	TPK-AA-241

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Item	Order code
Eartube in-ear 2.5 mm (0.1 in) right-angled jack	TPK-AA-250
Eartube in-ear 3.5 mm (0.14 in) right-angled jack	TPK-AA-240
Headsets, helmets, and breathing apparatus	
Behind head with noise canceling microphone and inline PTT Requires TP8100 audio accessory adapter Hirose 6-pin TPK-AA-001	TPA-AA-212[1]
Light-weight with boom microphone and inline PTT	TPB-AA-202
Light-weight with boom microphone and inline PTT Requires TP8100 audio accessory adapter Hirose 6-pin TPK-AA-001	TPK-AA-300
Overhead with noise canceling boom microphone and inline PTT Requires TP8100 audio accessory adapter Hirose 6-pin TPK-AA-001	TPK-AA-301
Speaker-microphones	
Enhanced GPS Evol Requires custom radio firmware: please contact your regional Tait office	TPK-AA-930
Light-weight (MIL-STD) 2.5mm (0.1in) jack	TPK-AA-100[3]
Light-weight 3.5 m (0.14in) jack	TPB-AA-101[3]
Medium weight 3.5mm (0.14in) jack	TPB-AA-102[3]
Speaker-microphone heavy duty (MIL-STD) with volume control and programmable button 2.5mm (0.1in) jack ISFM	TPK-AA-101[2]

[1] This accessory may have Intrinsically Safe (IS) approval for use with another Tait product, but it is does not have IS approval for use with a TP8100 radio. No accessory with the order code **TPA-AA**-xxx is certified Intrinsically Safe for use with a TP8100 radio. See the next footnote. The accessory is used with TP8100 radios that are not rated Intrinsically Safe.

[2] This accessory has IS approval, **to the ratings specified** in "IS-approved Accessories" on page 19, for use with an Intrinsically Safe TP8100 radio. The accessory is also used with TP8100 radios that are not rated Intrinsically Safe.

[3] A speaker-microphone numbered **TPK**-AA-100 or TPK-AA-101 has a socket suitable for a 2.5mm earphone jack. A speaker-microphone numbered **TPB**-AA-101 or TPB-AA-102 has a socket suitable for a 3.5mm earphone jack.