

# PART **A** Introduction

This part provides an introduction to servicing Tait Orca handportables. It includes an outline of the Tait Orca handportable range of products and precautions that should be taken before servicing Tait Orca handportables.

Detailed servicing instructions and information about spare parts are found in *Part D: Servicing the radio*.

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# Servicing Tait Orca handportables

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The Tait Orca series of handportables is a range of high performance, microprocessor-controlled radios manufactured using an RF-shielded PCB and high-density SMD componentry.

The manufacturing process does not allow direct servicing access to components on the main PCB, although replacement PCBs are available on an exchange basis. Service repairs of Tait Orca handportables are therefore limited to key mechanical and ancillary devices associated with the main PCB. These include:

- the front panel assembly;
- the lens (Orca Excel and Orca Eclipse);
- the PTT keypad;
- the speaker;
- the keypad (Orca Excel and Orca Eclipse);
- the volume plate and keypad (Orca Eclipse);
- the LCD display (Orca Excel and Orca Eclipse);
- the shield, complete with user interface PCB assembly and polyester dome (Orca Excel and Orca Eclipse);
- the main PCB assembly;
- the antenna connector;
- the channel selector switch (Orca Elan and Orca Excel);
- the volume control switch (Orca Elan and Orca Excel);
- the microphone;
- the speaker contacts;
- the battery contacts;
- the PTT tact switch;
- the RF out assembly; and
- the auxiliary flexible PCB.

The repair of PCB-related faults is the responsibility of the Tait repair centre, Tait Communications Ltd, Christchurch, New Zealand.

Detailed schematics and component location information for the main PCB may be obtained from the Customer Service Department at Tait Electronics Ltd. Contact your Tait dealer for more information about these two services.

## WWW technical support

Tait Electronics Ltd provides product support at the following address:

<http://www.taitworld.com/support>

At this site, you can send a request for support.

## What does this manual contain?

This manual is supplied as part of the Tait Orca handportable service kit, and provides the following:

- general information and specifications on the Tait Orca series of handportables;
- basic circuit descriptions;
- information on finding and servicing of non-PCB-related faults;
- information on Tait Orca battery packs and chargers;
- information on interfacing accessories to Tait Orca handportables; and
- a glossary of key terms.

For servicing information on Tait Orca 5000 series handportables, refer to the Orca 5000 service manual, order number M5000-00-10X.

## What is included in the calibration service kit?

The calibration service kit contains:

- calibration test unit (TOPA-SV-004);
- radio calibration cable for connecting the radio to the calibration test unit (TOPA-SV-007);
- 25 pin RS232 to modular phone jack programming lead for connecting the calibration test unit to a PC (TOPA-SV-012);
- DC service adaptor (TOPA-SV-005);
- SMA to N-type RF test lead for connecting to the radio's antenna connector (TOPA-SV-006);
- T6 driver bit and 8 mm socket (TOPA-SV-011);
- this manual; and
- Programming Utilities CD, which contains the Calibration Application, Conventional and Trunked Programming Applications, and Download and Configuration Application. It also contains PDF versions of all associated manuals.

Other items required for calibration but not included as part of the service kit are:

- RF communications test set (e.g. HP8920, MI2945/55, CMS52);
- digital current meter capable of measuring current up to 3 A, accurate to two decimal places.;
- DC power supply, 7.5 V, 3 A for handportables; and
- DC power supply, 13.8 V, 7 A for mobile radios.

## Programming kit

The programming kit for the Tait Orca series of handportables contains:

- accessory connector to modular phone

socket programming cable for connecting the radio to the programming lead (TOPA-SV-003); and

- 25 pin RS232 to modular phone jack programming lead for connecting the programming cable to a PC (TOPA-SV-012); and
- Programming Utilities CD, which contains the Calibration Application, Conventional and Trunked Programming Applications, and Download and Configuration Application. It also contains PDF versions of all associated manuals.

## Conventions

Throughout this manual, the names of software screen, field and menu names are referred to in **bold sans serif font**. For example:

Check that the information in the **Radio Model** fields (**Specifications** screen) is correct.

# The Tait Orca series of handportables

There are three Tait Orca series handportables available:

- the Orca Elan;
- the Orca Excel; and
- the Orca Eclipse.

This manual includes information specific to all three handportables. As new features and enhancements occur, new revisions of this manual will be released.

## Product codes

The digits in the Tait Orca product code provide information about the radio's functional parameters and various hardware options, according to the scheme outlined in Figure A-1. The product code scheme is not intended to imply that any particular combination of radio features is at present available or planned for later release. For more information on the products, contact your nearest Tait dealer.

Figure A-1: The Tait Orca product code scheme

<b>TOP-abcde-mn</b>	
Compliance Code (see note 8)	
TOP – Tait Orca Portable	c – User interface:
a – Frequency band:	1 Elan
A 66–88 MHz	2 Excel
B 136–174 MHz	3 Eclipse
C 174–225 MHz	d – Air interface:
D reserved	1 Conventional PMR
E reserved	2 MPT 1327 trunked
F reserved	3 <i>LTR trunked (see note 1)</i>
G 336–400 MHz	e – Reserved for compliance-relevant changes:
H 400–470 MHz	0 Initial default
I 450–530 MHz	m – Badging:
J 806–870 MHz Tx	G Reserved
851–870 MHz Rx	T Tait
K 896–941 MHz Tx	V TEL (Argentina, see note 7)
935–941 MHz Rx	U Unbadged (see note 8)
	Z Reserved
b – Channel space/IFBW:	n – Custom variations not affecting compliance:
1 12 kHz Medium IFBW (MB) –	0 Initial default
20/25/30 kHz Channel spacing	
(see note 1)	
2 10 kHz Universal IFBW (UB) –	
12.5/15/20/25/30 kHz Channel	
spacing	

## The Tait product code scheme

The Tait product code scheme is intended to describe the meaning of the various characters used in Tait Orca Product Codes. It is not a design-a-product menu. Supply of products not yet built can be negotiated, but are subject to commercial justification by Tait Electronics Ltd, and possible regulatory compliance.

Notes:

1. Information in italics refers either to obsolete or planned new items which are not available at the issue date of this document.
2. The offer of any product in any market is subject to adequate regulatory compliance.

3. Care must be taken not to enter alpha O instead of numeral 0, or alpha I instead of numeral 1. With the exception of I as a band designator, alphas I & O will not be used in this scheme.
4. This scheme does not address coding for packed ensembles of radio, battery, charger, antenna and/or other accessories.
5. Lower-case alpha character-location designation can be used as a convenient shorthand when listing products or compliances such as TOP-B2xy0, where x = 1~3, y = 1 or 2.
6. 'V' identifies TEL badged products are for sale in Argentina, where the name 'Tait' is registered to another Company.
7. 'U' identifies accessories which are generally Tait-badged, but an unbadged version has been produced for use with radios carrying a non-Tait badge.
8. The Compliance Code underline addresses regulator concerns that the full (3-group) code appearing on the product is not the same as the 2-group code under which Compliance was obtained. It appears only on the product label and some regulatory declarations.

This also permits the same Compliances to apply regardless of badging or minor custom variations expressed in the 3rd group. However, note that the first 2 groups of the Product Code may not necessarily be the same as the Compliance Code.

## Operating instructions

A user's guide is available for each radio. Figure A-9 shows the naming convention for Tait Orca radio user's guides.

# 409-00ABC-DD

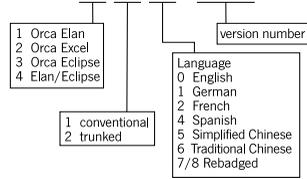


Figure A-9: Naming convention for Tait Orca handportable user's manuals

## Accessories

Table A-1 shows the accessories available for Tait Orca handportables. Of these accessories, only the chargers are serviceable.

For more information on chargers, see *Part E: Battery packs and chargers*. The six battery packs available for Tait Orca handportables are also described in Part E.

### Fitting an accessory

To fit some accessories to the radio, you will need to remove the rear accessory cover. Remove the battery, then insert the end of a key underneath the bottom edge of the accessory cover. Lift to remove the cover.

When attaching or removing an accessory, ensure that the lever is in the upright position. Once the accessory is in position, rotate the lever 90 degrees counterclockwise to lock it in place.

Note: The D-clip used in Tait Orca 5000 series handportables is not compatible with Orca Elan/Excel/Eclipse handportables.

### Fitting a non-Tait accessory

See *Part F: Interfacing non-Tait accessories* for information on using non-Tait accessories with Tait Orca handportables.

Table A-1: Tait Orca handportable accessories

Type of accessory	Product code	Description
Antennas	TOPA-AN-101	136-230 MHz 3" helical
	TOPA-AN-102	336-530 MHz 3" helical
	TOPA-AN-201	136-330 MHz 6" helical
	TOPA-AN-202	400-530 MHz 6" 1/4 wave whip
	TOPA-AN-204	806-870M 1/2 wave gain
	TOPA-AN-205	896-941M 1/2 wave gain
	TOPA-AN-301	66-88MHz 10" helical
	Audio accessories	TOPA-AA-001
TOPA-AA-002		Speaker microphone -30°C heavy duty, two function buttons
TOPA-AA-003		Speaker microphone -30°C MIL spec
TOPA-AA-004		Speaker microphone -30°C MIL spec RF
TOPA-AA-005		7.5 mm accessory adaptor
TOPA-AA-006		Tait Orca accessory connector kit
TOPA-AA-007		Tait Orca RF accessory connector kit
TOPA-AA-008		Speaker microphone, -30°C MIL spec, no function buttons, high/* low volume
TOPA-AA-009		2-wire palm microphone and earphone*
TOPA-AA-010		3-wire lapel microphone and earphone*
TOPA-AA-011		Light weight single speaker headset with in-line PTT*
TOPA-AA-012		Over-the-head headset with noise cancelling boom microphone*
TOPA-AA-013		Behind-the-head headset with noise cancelling boom microphone*
T952-051	Earphone kit with coil cord and 2.5 mm plug†	
Batteries	TOPB100	1100 mAh NiCd battery pack
	TOPB200	1500 mAh NiCd battery pack
	TOPB400	1500 mAh NiMH battery pack
	TOPB500	2000 mAh NiMH battery pack
	TOPB600	1100mAh NiCd battery pack (slim, no belt clip)
	TOPB700	1500 mAh NiMH battery pack (slim, no belt clip)
	Battery chargers	TOPA-CH-100
TOPA-CH-200		Desktop fast charger
TOPA-CH-300		Six-way multi-charger
Plug packs (for TOPA-CH-200)	T952-012	Australia, New Zealand and China (230 V 50 Hz input; plug configuration:  )
	T952-022	Singapore and Middle East (230 V 50 Hz input; plug configuration:  )
	T952-032	Mainland Europe (230 V 50 Hz input; plug configuration:  )
	T952-042	USA and Canada (115 V 60 Hz input; plug configuration:  )
	T952-052	UK and Hong Kong (230 V 50 Hz input; plug configuration:  )
Carrying accessories	TOPA-CA-001	Heavy duty carry case
	TOPA-CA-002	Heavy duty holster
	TOPA-CA-007	38 mm belt clip x 1
	TOPA-CA-003	38 mm belt clip x 10
	TOPA-CA-004	Accessory port cover x 10
	TOPA-CA-005	55 mm belt clip
	TOPA-CA-006	55 mm belt clip x 10

\* For use with TOPA-AA-005

† For use with TOPA-AA-003, TOPA-AA-004 and TOPA-AA-008

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# Important information

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## Basic servicing precautions

Tait Orca handportables require specialised servicing techniques and should only be serviced at an approved Tait service centre equipped with the necessary facilities.

Standard anti-static procedures should be followed; a typical setup is shown in Figure A-1.

If in doubt, contact Tait Electronics Ltd or your nearest Tait dealer.

### Warning!!!

Repairs attempted with incorrect equipment or by untrained personnel may result in permanent damage.

### Caution: CMOS devices

This equipment contains CMOS devices, which are susceptible to damage from static charges. Care when handling these devices is essential. For correct handling procedures, refer to manufacturers' data books covering CMOS devices, such as *Philips Data Handbook Covering CMOS Devices* or *Motorola CMOS Data Book Section 5 (Handling Procedures)*.

## Screw head types

Torx recess head screws and Pozidriv recess head screws require the correct sized driver to achieve best performance. Most of the screws in Tait Orca handportables are Torx head screws, and so a Torx T6 driver bit is supplied as part of the service kit. Some earlier radios have Pozidriv screws.

Torx head 1.8\*5 mm screws should be removed using the supplied Torx T6 driver. When replacing these screws, set the driver to 2 inch pounds.

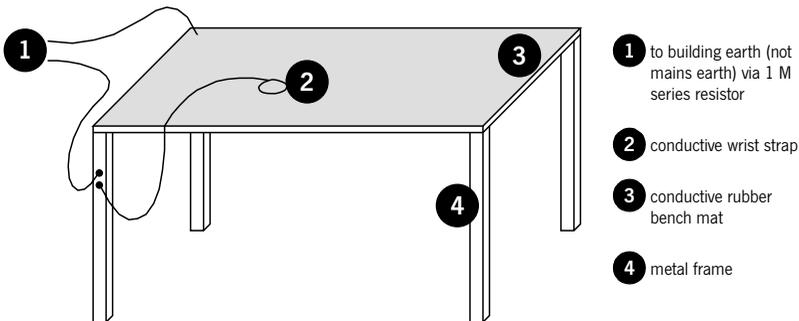
Pan Pozi M2\*8 mm and M2\*5 mm screws should be removed using a Pozi 1 driver. When replacing these screws, set the driver to 2 inch pounds.

## Programming

For information on programming Tait Orca handportables, refer to:

- the *Tait Orca Trunked Programming Application User's Manual* or the online help;
- the *Tait Orca Conventional Programming Application User's Manual* or the online help.

Figure A-1: Typical anti-static bench setup



The User's Manuals are on the Tait Programming Utilities (TPU) CD-ROM, which is included, together with this manual, as part of the calibration service kit.

## Calibrating

For information on calibrating Tait Orca handportables, refer to:

- the *Tait Orca Calibration Application User's Manual* or the online help.

The User's Manual is on the Tait Programming Utilities (TPU) CD-ROM, which is included, together with this manual, as part of the calibration service kit.

## Test facilities

Standard test facilities provide a way of testing the radio's functions independently of normal radio operation. See *Part C: Diagnostics and fault finding* for a description of the test facilities available for Tait Orca handportables.

## Basic maintenance

Your Tait Orca handportable requires no regular maintenance other than ensuring that the battery has sufficient charge, the battery contacts are kept clean and unobstructed, and that no damage has occurred to the antenna or the battery pack.

### General care

- Wipe the accessory connector contacts and radio display with a dry lint-free cloth to remove any dirt, oil or grease.
- Use a cloth dampened with clean water to clean the radio's case and display lens, but do not immerse the radio in fluids.
- Do not allow the radio to come into contact with detergents, alcohol, aerosol sprays or petroleum-based products as they may permanently damage the case.
- Avoid high temperatures. If the radio overheats, it will cease to function. You will hear two short high-pitched beeps.

## Troubleshooting

If you are experiencing difficulty operating your Tait Orca handportable check the following items:

- Is the battery firmly attached to the radio?
- Are the battery contacts clean and unobstructed?
- Is the battery sufficiently charged?
- Is the battery charger working properly?
- Is the antenna damaged?

For Fault Finding Charts see Figures C-1 to C-6 starting on page C-9. For further troubleshooting on batteries and chargers, see page E-15.

If all appears to be in order but your radio still fails to operate properly, consult your local Tait dealer for assistance.

