PART D

Servicing the radio

This part describes the disassembly and reassembly of Tait Orca handportables and the servicing of some key mechanical and ancillary devices.

Information is also provided on ordering spare parts for servicing handportables.

Contents

Servicing the radio

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

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

A list of spares kits available for servicing Tait Orca handportables is shown in Table D-1 on page D-16. These spares can be ordered from your local Tait dealer.

Screw head types

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. When removing screws be sure to use the correct driver.

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.

* Refer to Table D-2 on page D-16 for details.

Disassembling the radio

Removing the front panel from the chassis

Unscrew the antenna and detach the battery pack.

On Orca Elan and Orca Excel radios, the channel selector and on/off/volume control knobs need to removed before separating the front panel and the chassis.

To remove the knobs, insert a side cutter at the base of each knob, flat side down (Figure D-2), making sure not to damage the knob label and the switch shaft. Squeeze lightly; the knobs should pop off. Discard the knobs.

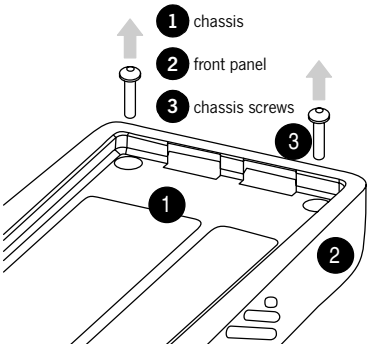
Some earlier Tait Orca radios have the knobs glued on. If so, the knob's metal insert will remain on the switch shaft. Remove the insert using a sharp scalpel blade.

Remove the two chassis screws at the base of the radio (Figure D-1), then reattach the battery and hold the base of the radio in one hand. With the other hand, pull the chassis from the front panel using the base of the battery as leverage (Figure D-3).

At this point you can replace the following:

- the front panel assembly;
- the PTT keypad (PTT key and function keys);
- the speaker;
- the lens (Orca Excel and Orca Eclipse);
- the keypad (Orca Excel and Orca Eclipse); and
- the volume plate and volume keypad (Orca Eclipse).

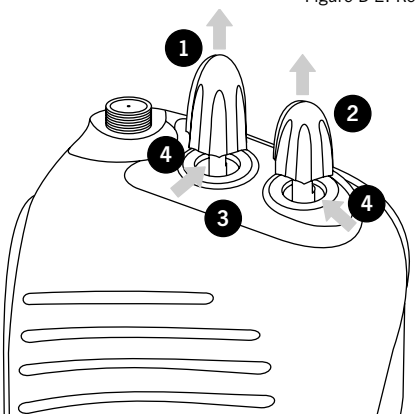
Figure D-1: Removing the chassis screws



Note that you should not attempt to remove the PTT keypad before removing the front panel from the chassis. See "Replacing the PTT keypad" on page D-8 for more information.

On Orca Eclipse radios, once the front panel has been removed from the chassis, the volume plate and keypad must be removed from the front panel before reassembly is attempted. Refer to Figure D-13 on page D-15.

Figure D-2: Removing the knobs (Orca Elan and Orca Eclipse)



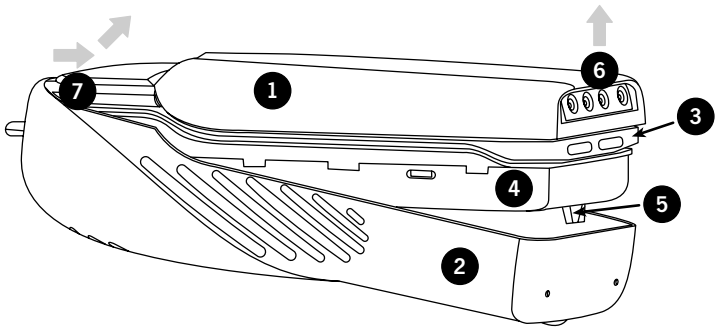
1 channel selector

2 on/off/volume control

3 knob label

4 insert side cutters here

Figure D-3: Removing the front panel from the chassis, using the battery as leverage



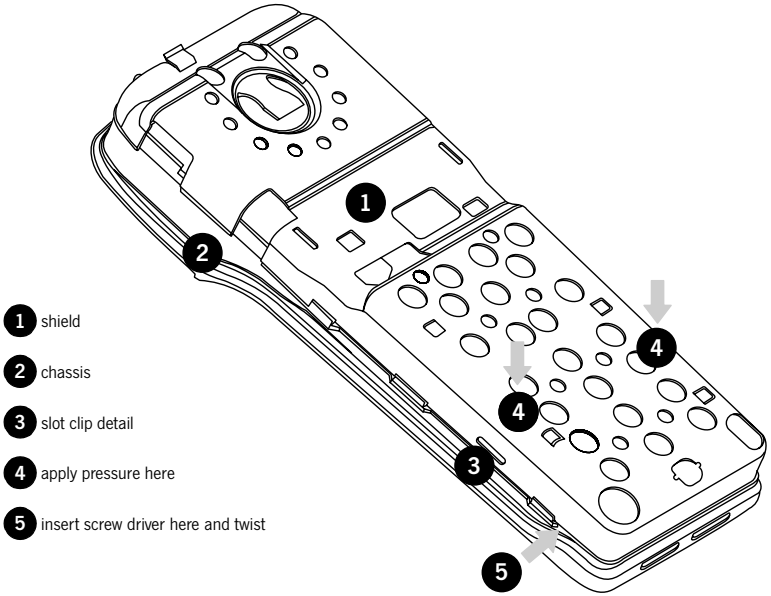
1. battery pack
2. front panel
3. chassis
4. shield
5. microphone grommet protruding from the shield
6. grip battery here, gently pull away from the front panel
7. pull radio out and away from the front panel at this point

Removing the shield from the chassis

To remove the shield, place the radio's internal assembly on a flat surface with the shield side facing up toward you. Press lightly down on the shield above the slot clip detail (shown in Figure D-4), which will slightly bow the shield away from the chassis.

Maintain pressure and insert a flat bladed screwdriver (approximately 4 mm) in the gap between the shield and the chassis. Twist the screwdriver and the shield should rise up over the clip.

Figure D-4: Removing the shield from the chassis



1. shield
2. chassis
3. slot clip detail
4. apply pressure here
5. insert screw driver here and twist

Repeat this on the other side. Remove the microphone grommet by pulling upward (Figure D-5).

You can now see the bottom surface of the PCB. The basic layout of the PCB is shown in Figures D-8 and D-9. Refer to these diagrams for the placement of parts.

Note that on Orca Excel and Orca Eclipse radios, the user interface loom must be detached from the main PCB before the shield can be separated from the main PCB and chassis.

At this point you can replace:

- the LCD display (Orca Excel and Orca Eclipse); and
- the shield, complete with user interface PCB assembly and polyester dome (Orca Excel and Orca Eclipse).

Removing the PCB from the chassis

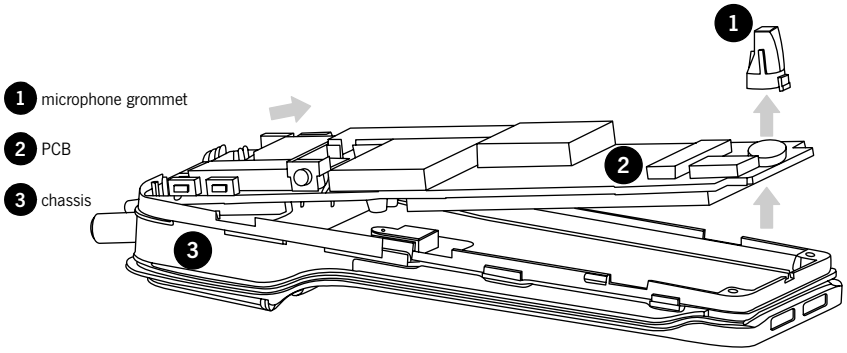
Remove the knob seal, which covers the antenna connector, channel selector switch (Orca Elan and Orca Excel) and volume control switch (Orca Elan and Orca Excel).

Remove the screw through the PA shield. Remove the three nuts for the antenna connector and knobs using the supplied 8 mm long reach socket driver, then remove the three ribbed lock washers. Gently lift the PCB up to the angle shown in Figure D-5, then pull it away from the chassis.

At this point you can replace:

- 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; and
- the RF out assembly.

Figure D-5: Removing the PCB from the chassis (Orca Elan or Orca Excel shown)



Removing the rear panel

Follow the disassembly instructions and disassemble the radio to the PCB level. Refer to Figure D-10 for the details of the rear panel assembly.

Insert a small flat bladed screw driver under the auxiliary dummy rear cover and apply pressure to push the dummy rear cover lugs free of the holes in the rear panel. To remove the rear panel, either:

- slide the cover forward by pushing at the base with your thumbs; or
- insert a small flat-bladed screwdriver just under the notch in the base and twist.

Remove the rear panel seal. Note that the RF contact pin normally remains in the rear panel seal. Make sure that this is not lost during disassembly.

Using a calibration pin, lift the auxiliary flexible PCB contact area from the lower lefthand corner. Remove the flexible PCB with the seal from the chassis; they should come out as a unit.

You can now replace the auxiliary flexible PCB.

Replacing key mechanical and ancillary devices

This section describes the replacement of key mechanical and ancillary devices associated with the main PCB. These include:

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

Note that instructions for replacing the RF out assembly, the auxiliary flexible PCB and the Orca Eclipse volume key pad and plate are included as part of the reassembly instructions.

Refer to Figures D-8 and D-9 for the placement of parts. Once the required devices have been replaced, refer to the reassembly instructions on pages D-13 to D-15.

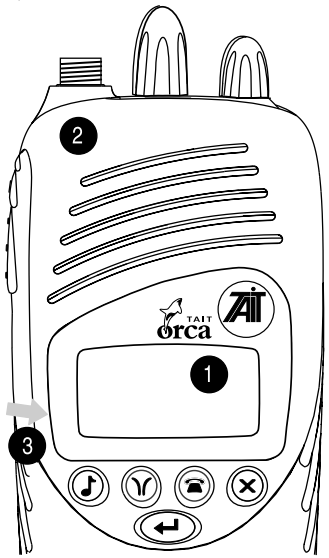
Replacing the lens (Orca Excel and Orca Eclipse)

You must dissasemble the radio before gently prising the lens away from the front panel of the radio. Remove any adhesive remaining on the front panel.

Peel the paper from the back of the new lens, and place the lens in position on the front panel, so that the lugs on the back of the new lens fit into the holes in the front panel.

Press firmly into position, then remove the piece of clear plastic from the front of the lens.

Figure D-6: Replacing the lens (Orca Excel and Orca Eclipse)



1 lens

2 front panel (Orca Excel shown)

3 gently prise the lens away from the front panel

Replacing the PTT keypad

Following the disassembly instructions, remove the front panel from the chassis.

To remove the PTT retaining plate, from the inside of the front panel, gently push the five latches that hold the retaining plate in place. Be careful not to lose the two pins that act as actuators for the function keys.

To replace the PTT retaining plate, fit the keypad to the retaining plate, making sure not to split or otherwise damage it. Place the three clips on the long edge of the retaining plate into place, then make sure the actuators for the function keys and PTT key fit into the holes on the front panel. Clip the retaining plate into place.

Replacing the speaker

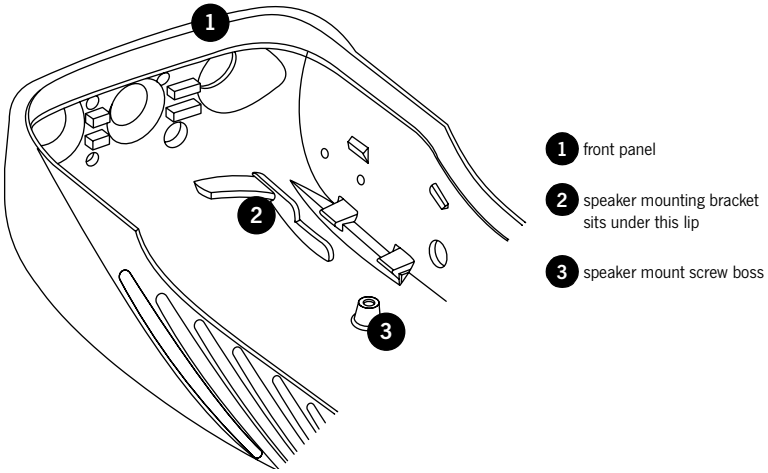
Following the disassembly instructions, remove the front panel from the chassis. The speakers sits in the mounting bracket on the inside of the front panel (see Figure D-7).

If the mounting bracket is damaged, remove the two screws at the base of the mounting bracket. Lift the speaker and mounting bracket out and discard.

Insert the new speaker and mounting bracket in the front panel, making sure the top edge of the mounting bracket goes under the lip in the front panel (Figure D-7). Replace the two screws to secure the speaker in place, gently tightening them to 1.5 inch pounds.

If the mounting bracket is not damaged, remove the speaker from the mounting bracket. Replace the adhesive ring and secure a new speaker in place.

Figure D-7: Mounting the speaker in the front panel (Orca Elan or Orca Excel shown)



Replacing the LCD display (Orca Excel and Orca Eclipse)

Following the disassembly instructions, remove the shield from the front panel and unplug the user interface loom from the main PCB.

Unplug the LCD display loom from the user interface PCB, remove the LCD display from the shield and discard the LCD display. Remove any adhesive remaining on the shield.

Position the new LCD display on the shield, pass the LCD loom through the gap in the shield and plug into the connector on the user interface PCB. Push down the two connector lugs to secure the loom.

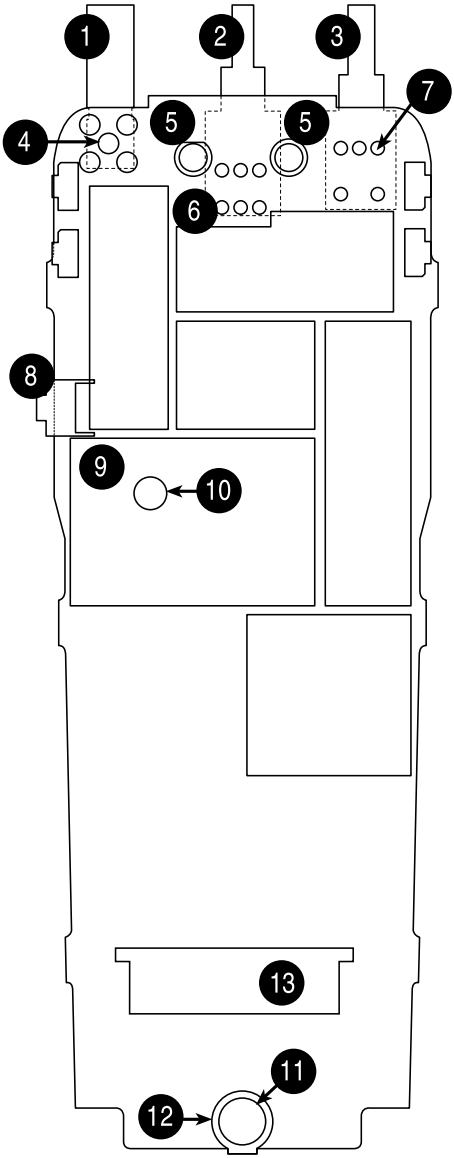
Plug the user interface PCB loom onto the connector on the main PCB and push down the connector lugs to secure.

Refit the shield onto the chassis (refer to page D-14 for detailed instructions).

Position a piece of foam tape on the shield, in the centre of the LCD area. Position the LCD display on the foam tape in such a way that the top left corner of the LCD does not interfere with the PTT switch. Place the LCD holder over the LCD, fitting the LCD holder locating blocks into the holes in the shield.

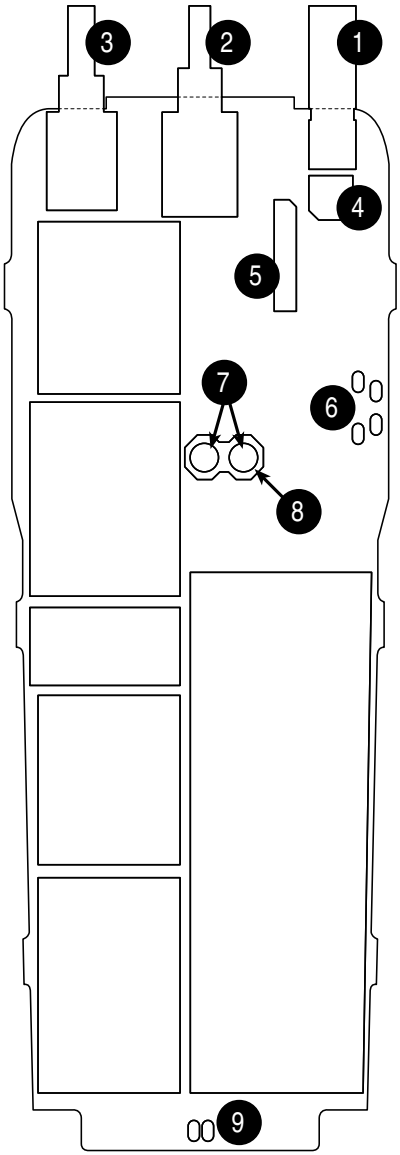
Refit the front panel to the chassis (refer to page D-15 for detailed instructions).

Figure D-8: Bottom surface of the PCB, which is visible when the shield has been removed from the chassis (Orca Elan or Orca Excel shown)



1. antenna connector
2. channel selector switch
3. on/off/volume control switch
4. antenna connector pin placement (5 pins)
5. speaker contact pin placement
6. channel selector pin placement (6 pins)
7. on/off/volume control pin placement (5 pins)
8. PTT tact switch
9. PA can
10. PA screw
11. microphone placement
12. microphone grommet placement
13. user interface loom connector

Figure D-9: Top surface of PCB, which is visible only when the PCB has been removed from the chassis (Orca Elan or Orca Excel shown)



1. antenna connector
2. channel selector switch
3. on/off/volume control switch
4. RF assembly placement
5. auxiliary flex socket
6. PTT tact pin placement (4 pins)
7. battery contact placement
8. battery contact seal placement
9. microphone pin placement (2 pins)

Replacing the shield, user interface PCB assembly and polyester dome (Orca Excel and Orca Eclipse)

On Orca Excel and Orca Eclipse radios the shield, user interface PCB and polyester dome are replaced as one complete assembly.

Following the disassembly instructions, remove the shield from the front panel and unplug the user interface loom from the user interface PCB.

Remove the LCD display assembly from the discarded shield, and fit to the replacement shield according to the instructions on page D-9.

Plug the user interface loom into the connector on the new user interface PCB, and reassemble the shield onto the chassis according to the instructions on page D-14.

Note that the light pipe in the discarded shield will need to be repositioned in the new shield.

Replacing the antenna connector, channel selector switch (Orca Elan and Orca Excel) and volume control switch (Orca Elan and Orca Excel)

Following the disassembly instructions, disassemble the radio to the PCB level. Remove the PCB from the chassis.

If any of the antenna connector, channel selector switch or volume control switch need to be replaced, remove them using a vacuum-operated solder station. Replace them according to the reassembly instructions on pages D-13 to D-15.

Replacing the microphone

Following the disassembly instructions, disassemble the radio to the PCB level. Remove the PCB from the chassis.

Use a desoldering station to remove the microphone. Discard the microphone.

When replacing the microphone, make sure it is aligned with the marks on the PCB, since it is polarised. Refer to Figures D-8 and D-9 for the placement of the microphone.

The microphone should not hang over the edge of the PCB. Solder it in place using a light-tip soldering iron (e.g. Weller PTR7 tip).

Replacing the battery and speaker contacts

Following the disassembly instructions, disassemble the radio to the PCB level. Remove the PCB from the chassis.

When replacing one of the battery or speaker contacts, replace the other contact, even if only one is faulty. If available, use solder paste to replace the contacts.

Note that the contacts are heat-sensitive and will fail if they are overheated.Low temperature solder must be used and the contacts must not be heated above 260°C.

Remove the contact with a soldering iron and discard. Refer to Figures D-7 and D-8 for the placement of the battery and speaker contacts.

Solder the replacement contact in place using a heavy-tip soldering iron (e.g. Weller 2PTCC8 tip). Hold onto the contact with a pair of pliers and apply large amounts of solder to the PCB, rather than to the contact, to avoid damaging the contact.

Replacing the tact switch

Following the disassembly instructions, disassemble the radio to the PCB level. Remove the PCB from the chassis.

Remove the PTT tact switch using a desoldering station or solderwick. Note that there is a lot of solder on both sides of the board, so be sure to remove it all.

Refer to Figures D-8 and D-9 for the placement of the PTT tact switch.

Place the new PTT on the board and solder it in place using a heavy-tip soldering iron (e.g. Weller 2PTCC8 tip).

Reassembling the radio

This section describes the reassembly of the radio once the required units have been serviced. Additional instructions for replacing the following mechanical and ancillary devices are also included:

- auxiliary flexible PCB;
- RF out assembly;
- volume plate and volume keypad (Orca Eclipse);
- antenna connector;
- channel selector switch (Orca Elan and Orca Excel); and
- volume control switch (Orca Elan and Orca Excel).

Rear panel reassembly and replacing the auxiliary flexible PCB

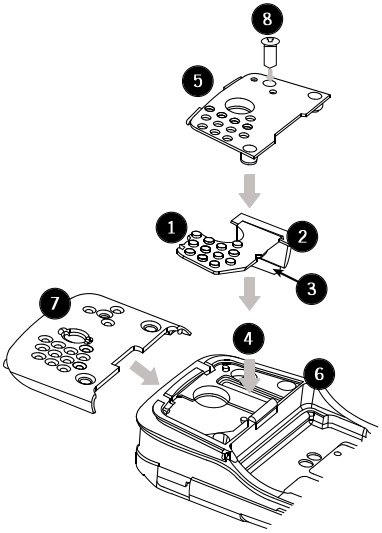
Follow the instructions on page D-7 to access the auxiliary flexible PCB, and replace. Push the flexible PCB with seal firmly into the chassis, aligning the notch in the seal with the locating pin on the chassis (see Figure D-10). The rubber must sit flush with the back of the chassis or the rear panel will not sit properly and the battery will not fit correctly.

Fold the flexible PCB over and fit the contact area on the chassis; it should fit snugly in place.

Replace the rear panel seal by tucking the two tags at the top of the seal under the lip on the chassis and folding it over the flexible PCB. Check that the RF contact pin is positioned correctly in the rear panel seal, and that the seal is flush with the chassis.

Slide the rear panel on from the top of the radio (Figure D-10). Force it into place by pressing the top edge of the cover against the edge of a table; it will clip home. Make sure the gap between the cover and the chassis is as small as possible. Refit the auxiliary dummy cover by pushing the lugs into the holes on the rear panel.

Figure D-10: Rear panel assembly



1. auxiliary flexible PCB
2. auxiliary flex seal
3. end of auxiliary flex connector protruding through the seal
4. make sure the seal and auxiliary flex are firmly seated in the chassis here
5. rear panel seal
6. chassis
7. replace rear panel
8. RF contact pin

Fitting the PCB to the chassis and replacing the RF out assembly

Put the battery contact seal over the battery contacts rather than into the chassis. If you put the seal on the chassis, the contacts will squash the seal.

Fit the replacement RF out assembly as shown in Figure D-11.

If you have removed the antenna connector or either of the switches (Orca Elan or Orca Excel radios only), fit them on the PCB (refer to Figures D-8 and D-9), but do not yet solder them in place. Align them with the holes in the chassis, and as you lower the PCB onto the chassis, make sure the accessory flex protruding from the chassis fits into the socket on the PCB. Lower the PCB onto the chassis, making sure it is firmly seated.

Fit the PA screw loosely in place. Align the switches so they are centred (Orca Elan or Orca Excel only), referring to Figures D-8 and D-9 for placement.

Figure D-12 shows the reassembly of the antenna and switches. Replace the washers, making sure the cone faces up. The nuts for the two switches are black.

Replace the nuts, making sure they are threaded correctly before using an 8 mm long reach socket driver set to 10 inch pounds. Then tighten the PA screw to 2 inch pounds.

Using a heavy-tip soldering iron (e.g. Weller 2PTCC8 tip), solder the antenna connector and two switches in place, if required, taking care not to damage the surrounding components.

Replace the knob seal over the antenna connector and the two switches (see Figure D-12).

Fitting the shield to the chassis

Replace the microphone grommet over the microphone.

Replace the shield from the top of the radio, ensuring that the two pins on the chassis go into the two holes at the top of the shield.

Should the main seal need replacing, place the new seal so that the notch at the top of the chassis (behind the channel selector switch on the Orca Elan and Orca Excel radios) matches that on the seal and the profile matches the chassis.

Run your finger around the seal to ensure that it fits properly into the seal retaining well.

Figure D-11: Placing the RF out assembly (Orca Elan or Orca Excel shown)

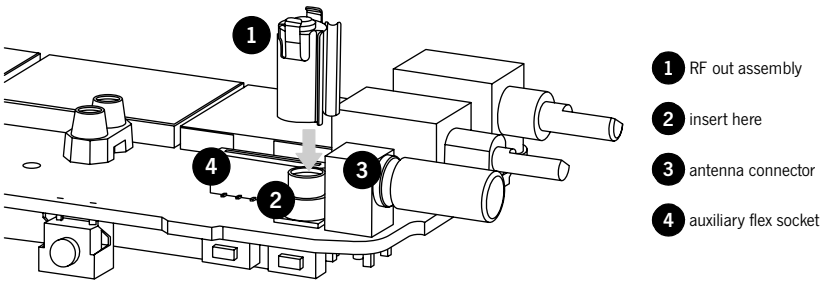
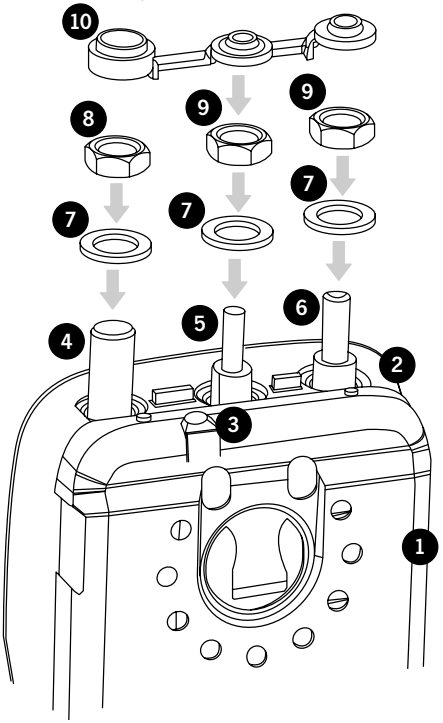


Figure D-12: Assembly of the switches (Orca Elan and Orca Excel)



1. shield
2. chassis
3. light pipe
4. antenna connector
5. channel selector switch
6. on/off/volume control switch
7. ribbed lock washer (M6*10*0.7 mm)
8. SMA connector nut (¼*7.9*3 mm)
9. channel/volume control nut (M6*7.9*3 mm)
10. knob seal

Fitting the front panel to the chassis

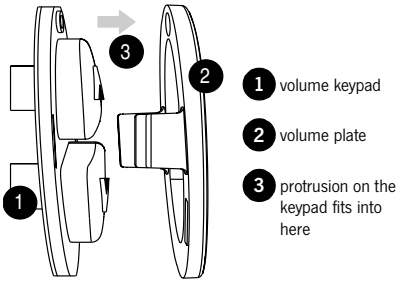
Place the radio into the front panel top first, inserting the antenna connector and knob switches through the holes. Gently ease the radio into the front panel until the edge of the chassis is flush with the edge of the front panel, while making sure that the seal is not pinched; using the battery as leverage as in radio disassembly may be helpful. Replace the two chassis screws at the base of the radio, tightening them to 2 inch pounds.

On Orca Elan and Orca Excel radios, replace the two knobs with new knobs, after placing a spot of Loctite™ 680 on each switch shaft. Make sure there is no gap between the base of each knob and the knob label by firmly pressing the top of each knob against a firm surface. Choose a surface that will not damage the top of the knob.

On Orca Eclipse radios, once the front panel has been fitted to the chassis, the volume keypad and volume plate can now be fitted in place. Figure D-13 shows the assembly of the volume keypad onto the volume plate.

Fit the keypad to the plate, aligning the round protrusion on the key pad with the hole in the plate. Clip the volume plate into position on the Orca Eclipse front panel, orientated so that the hole end is closest to the top of the radio.

Figure D-13: Assembly of the volume keypad and plate (Orca Eclipse)



1. volume keypad
2. volume plate
3. protrusion on the keypad fits into here

Spares kits

The following table shows a list of spares kits which are currently available for servicing Tait Orca handportables. Spares kits are designed to service 100 radios, and can be ordered from your local Tait dealer.

Table D-1: Spares kits

Product code	Description
TOPA-SP-101	Orca Elan radio spares kit
TOPA-SP-102	Orca Elan re-skinning kit
TOPA-SP-103	Orca Excel radio spares kit
TOPA-SP-104	Orca Excel re-skinning assembly kit
TOPA-SP-105	Orca Elan front panel assembly kit
TOPA-SP-106	Orca Excel front panel assembly kit
TOPA-SP-107	Orca Eclipse/Excel interface PCB complete with mechanical shield
TOPA-SP-108	Orca Eclipse spares kit
TOPA-SP-109	Orca Eclipse re-skinning kit
TOPA-SP-501	Volume knobs x 10
TOPA-SP-502	Channel knobs x 10
TOPA-SP-504	Battery clip x 10
TOPA-SP-505	Orca dummy cover (universal) x 10

The contents of the Orca Elan and Orca Excel spares kits (TOPA-SP-101 and TOPA-SP-103) are shown in Tables D-3 and D-4. The contents of the Orca Elan and Orca Excel re-skinning kits are shown in Tables D-6 and D-7.

Note that the 'IPN' column is the ten digit 'internal part number' which uniquely identifies any component used in a Tait product.

The numbers in the 'Reference' column are Figure numbers in which the spares item is shown, and the number in brackets refers to the numbered legend within each figure.

Tait Orca main PCBs are available on an replacement basis from Tait Electronics Ltd. Quote the product code shown in Table D-2 when using this service.

Table D-2: Replacement Boards

Product code	Description
TOP-A2110-KS	66-88MHz Elan Conventional
TOP-A2210-KS	66-88MHz Excel Conventional
TOP-A2310-KS	66-88MHz Eclipse Conventional
TOP-B2110-KS	136-174MHz Elan Conventional
TOP-B2120-KS	136-174MHz Elan Trunked
TOP-B2210-KS	136-174MHz Excel Conventional
TOP-B2220-KS	136-174MHz Excel Trunked
TOP-B2310-KS	136-174MHz Eclipse Conventional
TOP-C2210-KS	174-225MHz Excel Conventional
TOP-G2110-KS	336-400MHz Elan Conventional
TOP-G2120-KS	336-400MHz Elan Trunked
TOP-G2210-KS	336-400MHz Excel Conventional
TOP-G2220-KS	336-400MHz Excel Trunked
TOP-G2310-KS	336-400MHz Eclipse Conventional
TOP-H2110-KS	400-470MHz Elan Conventional
TOP-H2120-KS	400-470MHz Elan Trunked
TOP-H2210-KS	400-470MHz Excel Conventional
TOP-H2220-KS	400-470MHz Excel Trunked
TOP-H2310-KS	400-470MHz Eclipse Conventional
TOP-I2110-KS	450-530MHz Elan Conventional
TOP-I2120 -KS	450-530MHz Elan Trunked
TOP-I2210-KS	450-530MHz Excel Conventional
TOP-I2220-KS	450-530MHz Excel Trunked
TOP-I2310-KS	450-530MHz Eclipse Conventional
TOP-J2110-KS	806-870MHz Elan Conventional
TOP-J2120-KS	806-870MHz Elan Trunked
TOP-J2220-KS	806-870MHz Excel Trunked
TOP-K2110-KS	896-941MHz Elan Conventional
TOP-K2210-KS	896-941MHz Excel Conventional
TOP-K2220-KS	896-941MHz Excel Trunked

Table D-3: Orca Elan spares kit (TOPA-SP-101)

IPN	Description	Quantity supplied	Reference
345-00020-11	Chassis screw (M2*8 mm PanTorx)	10	D-1 (3)
311-01044-02	Channel selector knob	20	D-2 (1)
311-01043-02	Volume control knob	20	D-2 (2)
316-06633-01	Knob label	5	D-2 (3)
316-06634-01	Front panel logo plate	1	–
319-01203-01	Shield	5	D-4 (1)
362-01092-02	Main seal	20	–
303-11194-02	Handportable chassis	5	D-4 (2), D-5 (3)
360-02015-00	Microphone grommet/seal	10	D-5 (1)
311-03099-01	PTT keypad	20	–
316-85124-00	PTT retaining plate	10	–
360-01060-00	PTT/function key actuator	40	–
349-00030-02	Speaker screw (1.8*5 mm Torx)	10	D-7 (3)
252-00010-55	Speaker 0.5 W 16 Ω	5	–
302-05231-01	Speaker mounting bracket	5	–
369-01039-00	Speaker cloth	5	–
231-00010-45	Channel selector switch	10	D-8 (2), D-9 (2)
040-05500-08	Volume control switch	10	D-8 (3), D-9 (3)
232-00010-37	PTT tact switch	5	D-8 (8), D-9 (6)
345-00020-09	PA screw (M2*5 mm Pan Pozi)	10	D-8 (10)
252-00010-56	Microphone	5	D-8 (11)
356-01077-00	Battery contact probe	10	D-9 (7)
362-01087-00	Battery contact seal	10	D-9 (8)
308-01057-01	Aux dummy rear cover	20	–
220-01414-03	Aux flex connector PCB	5	D-10 (1)
362-01089-01	Auxiliary flex seal	10	D-10 (2)
362-01088-00	Rear panel seal	10	D-10 (5)
316-06632-01	Rear panel	5	D-10 (7)
219-50029-01	RF out assembly	5	D-11 (1)
240-02156-01	Antenna SMA connector 1/4 x 36	10	D-12 (4)
353-00010-42	Ribbed lock washer (M6*10*0.7 mm)	30	D-12 (7)
352-01053-00	Antenna SMA connector nut	10	D-12 (8)
352-00010-52	Channel/volume control nut (M6*7.9*3 mm)	20	D-12 (9)
362-01091-01	Knob seal	10	D-12 (10)
303-30071-02	Battery catch	20	–
303-50091-00	Belt clip	20	–
OPP100:	Orca Elan front panel assembly. This comprises the following parts:	1	–
	252-00010-55 Speaker 0.5 W 16 Ω	1	
	302-05231-01 Speaker mounting bracket	1	
	307-01021-00 Speaker grill	1	
	316-06629-00 Orca Elan front panel	1	
	316-06633-00 Knob label	1	
	316-06634-01 Front panel logo plate	1	
	349-00030-00 Speaker screw (1.8*5 mm Torx)	2	
	354-01044-00 Bush M2 threaded brass	2	
	369-01039-00 Speaker cloth	1	

Table D-4: Orca Excel spares kit (TOPA-SP-103)

IPN	Description		Quantity supplied	Reference
345-00020-11	Chassis screw (M2*8 mm PanTorx)		10	D-1 (3)
311-01044-02	Channel selector knob		20	D-2 (1)
311-01043-02	Volume control knob		20	D-2 (2)
316-06633-01	Knob label		5	D-2 (3)
362-01092-02	Main seal		20	–
303-11194-02	Handportable chassis		5	D-4 (2), D-5 (3)
360-02015-00	Microphone grommet/seal		10	D-5 (1)
311-03099-01	PTT keypad		20	–
316-85124-01	PTT retaining plate		10	–
360-01060-00	PTT/function key actuator		40	–
312-01071-00	Lens		2	D-6 (1)
349-00030-02	Speaker screw (1.8*5 mm Torx)		10	D-7 (3)
252-00010-55	Speaker 0.5 W 16 Ω		5	–
302-05231-01	Speaker mounting bracket		5	–
369-01039-00	Speaker cloth		5	–
231-00010-45	Channel selector switch		10	D-8 (2), D-9 (2)
040-05500-08	Volume control switch		10	D-8 (3), D-9 (3)
232-00010-37	PTT tact switch		5	D-8 (8), D-9 (6)
345-00020-09	PA screw (M2*5 mm Pan Pozi)		10	D-8 (10)
252-00010-56	Microphone		5	D-8 (11)
356-01077-00	Battery contact probe		10	D-9 (7)
362-01087-00	Battery contact seal		10	D-9 (8)
308-01057-01	Aux dummy rear cover		20	–
220-01414-03	Aux flex connector PCB		5	D-10 (1)
362-01089-01	Auxiliary flex seal		10	D-10 (2)
362-01088-00	Rear panel seal		10	D-10 (5)
316-06632-01	Rear panel		5	D-10 (7)
219-50029-01	RF out assembly		5	D-11 (1)
240-02156-01	Antenna SMA connector		10	D-12 (4)
353-00010-42	Ribbed lock washer (M6*10*0.7 mm)		30	D-12 (7)
352-01053-00	Antenna SMA connector nut		10	D-12 (8)
352-00010-52	Channel/volume control nut (M6*7.9*3 mm)		20	D-12 (9)
362-01091-01	Knob seal		10	D-12 (10)
303-30071-02	Battery catch		20	–
303-50091-00	Belt clip		20	–
008-36671-80	LCD display		1	–
304-07042-00	LCD holder		1	–
311-03101-01	Orca Excel keypad		5	–
220-01501-00	User interface loom PCB		5	–
OPP200:	Orca Excel front panel assembly. This comprises the following parts:		1	–
	252-00010-55	Speaker 0.5 W 16 Ω	1	
	302-05231-01	Speaker mounting bracket	1	
	307-01021-00	Speaker grill	1	
	312-01071-00	Lens	1	
	316-06633-00	Knob label	1	
	316-06636-00	Orca Excel front panel	1	
	349-00030-00	Speaker screw (1.8*5 mm Torx)	2	
	354-01044-00	Bush M2 threaded brass	2	
	369-01039-00	Speaker cloth	1	
	Orca Excel user interface PCB and polyester dome, assembled on the shield. This comprises the following parts:		5	–
	OPF200-A	User interface PCB assembly	5	
	311-04004-00	Polyester dome	5	
	319-01203-01	Shield	5	

Table D-5: Orca Eclipse spares kit (TOPA-SP-108)

IPN	Description		Quantity supplied	Reference
345-00020-11	Chassis screw (M2*8 mm PanTorx)		10	D-1 (3)
311-03102-01	TOP High Tier Keypad		5	–
316-85123-00	Eclipse volume plate		20	–
365-00011-38	Yellow Static Warning Label		3	–
362-01092-02	Main seal		20	–
303-11194-02	Handportable chassis		5	D-4 (2), D-5 (3)
360-02015-00	Microphone grommet/seal		10	D-5 (1)
311-03099-01	PTT keypad		20	–
316-85124-01	PTT retaining plate		10	–
360-01060-00	PTT/function key actuator		40	–
312-01071-00	Lens		2	D-6 (1)
349-00030-02	Speaker screw (1.8*5 mm Torx)		10	D-7 (3)
252-00010-55	Speaker 0.5 W 16 Ω		5	–
302-05231-01	Speaker mounting bracket		5	–
369-01039-00	Speaker cloth		5	–
231-00010-45	Channel selector switch		10	D-8 (2), D-9 (2)
040-05500-08	Volume control switch		10	D-8 (3), D-9 (3)
232-00010-37	PTT tact switch		5	D-8 (8), D-9 (6)
345-00020-09	PA screw (M2*5 mm Pan Pozi)		10	D-8 (10)
252-00010-56	Microphone		5	D-8 (11)
356-01077-00	Battery contact probe		10	D-9 (7)
362-01087-00	Battery contact seal		10	D-9 (8)
308-01057-01	Aux dummy rear cover		20	–
220-01414-03	Aux flex connector PCB		5	D-10 (1)
362-01089-01	Auxiliary flex seal		10	D-10 (2)
362-01088-00	Rear panel seal		10	D-10 (5)
316-06632-01	Rear panel		5	D-10 (7)
219-50029-01	RF out assembly		5	D-11 (1)
240-02156-01	Antenna SMA connector		10	D-12 (4)
353-00010-42	Ribbed lock washer (M6*10*0.7 mm)		10	D-12 (7)
352-01053-00	Antenna SMA connector nut		10	D-12 (8)
362-01091-01	Knob seal		10	D-12 (10)
303-30071-02	Battery catch		20	–
303-50091-00	Belt clip		20	–
008-36671-80	LCD display		1	–
304-07042-00	LCD holder		1	–
311-03100-01	Eclipse keypad		5	–
220-01501-00	User interface loom PCB		5	–
OPP300:	Orca Eclipse front panel assembly. This comprises the following parts:		1	–
	252-00010-55	Speaker 0.5 W 16 Ω	1	
	302-05231-01	Speaker mounting bracket	1	
	307-01021-00	Speaker grill	1	
	312-01071-00	Lens	1	
	316-05104-01	Orca Eclipse front panel	1	
	349-00030-00	Speaker screw (1.8*5 mm Torx)	2	
	354-01044-00	Bush M2 threaded brass	2	
	369-01039-00	Speaker cloth	1	
	Orca Eclipse user interface PCB and polyester dome, assembled on the shield. This comprises the following parts:		5	–
	OPF200-A	User interface PCB assembly	5	
	311-04004-00	Polyester dome	5	
	319-01203-01	Shield	5	

Table D-6: Orca Elan re-skinning kit (TOPA-SP-102)

IPN	Description	Quantity supplied
311-01043-02	Volume control knob	1
311-01044-02	Channel selector knob	1
311-03099-01	PTT keypad	1
316-06632-01	Rear panel	1
316-85124-01	PTT retaining plate	1
345-00020-11	Chassis screw (M2*8 Pan Torx)	2
360-01060-00	PTT/function key actuator	2
362-01088-00	Rear panel seal	1
362-01091-01	Auxiliary flex seal	1
362-01092-02	Main seal	1
OPP100	Elan front panel assembly	1

Table D-7: Orca Excel re-skinning kit (TOPA-SP-104)

IPN	Description	Quantity supplied
311-01043-02	Volume control knob	1
311-01044-02	Channel selector knob	1
311-03099-01	PTT keypad	1
316-06632-01	Rear panel	1
316-85124-01	PTT retaining plate	1
345-00020-11	Chassis screw (M2*8 Pan Torx)	2
360-01060-00	PTT/function key actuator	2
362-01088-00	Rear panel seal	1
362-01091-01	Auxiliary flex seal	1
362-01092-02	Main seal	1
OPP200	Excel front panel assembly	1

Table D-8: Orca Eclipse re-skinning kit (TOPA-SP-109)

IPN	Description	Quantity supplied
311-03100-01	Eclipse keypad	1
316-85123-00	Eclipse volume plate	1
311-03099-01	PTT keypad	1
316-06632-01	Rear panel	1
316-85124-01	PTT retaining plate	1
345-00020-11	Chassis screw (M2*8 Pan Torx)	2
360-01060-00	PTT/function key actuator	2
362-01088-00	Rear panel seal	1
362-01091-01	Auxiliary flex seal	1
362-01092-02	Main seal	1
OPP300	Eclipse front panel assembly	1