

3 T807/808 Introduction To Servicing

This section provides specific information on servicing procedures for the T807/808 and should be read in conjunction with Part A (General Servicing Procedures) of this manual.

The following topics are covered in this section.

Section	Title	Page
3.1	General	3.3
3.1.1	Warning: Lethal Voltages	3.3
3.1.2	Caution: Ventilation	3.3
3.1.3	Caution: Replacing Components Connected To The Mains	3.3
3.1.4	Caution: Handle With Care	3.4
3.1.5	Caution: Heatsink/Case Temperature	3.4
3.1.6	Caution: Earthing Of Rack Frame	3.4
3.1.7	Caution: Cabinet Requirements To Meet Safety Specifications	3.4
3.2	Mechanical	3.5
3.2.1	Construction	3.5
3.2.2	Disassembly Instructions	3.5
3.2.2.1	To Gain Access To The Component Side Of The PCB	3.5
3.2.2.2	To Gain Access To The Solder Side Of The PCB	3.5
3.2.3	Reassembly Instructions	3.6
3.2.4	Screw Torques	3.6
3.3	Component Replacement	3.7
3.3.1	Critical Components	3.7
3.3.2	To Replace The Power MOSFET Transistors (Q1 & Q2)	3.7
3.3.3	To Replace The Output Rectifier (D43)	3.8
3.4	Technical Instructions	3.9

3.1 General

If you require further information about the T807/808 or this manual, contact your nearest authorised Tait Dealer or Service Centre. Further assistance may be obtained from the Customer Support Group, Radio Infrastructure Division, Tait Electronics Ltd, Christchurch, New Zealand.

When requesting this information, please quote the equipment type number (e.g. T807-10) and serial number. In the case of the service manual quote the Tait Internal Part Number (IPN), e.g. M800-00-100, and for circuit diagrams quote the "Title", "IPN" and "Issue".



3.1.1 Warning: Lethal Voltages

The T807/808 power supply contains voltages that may be lethal.

Disconnect the mains IEC connector and wait for 5 minutes for the internal voltages to drain away before dismantling.

The power on/off switch does **not** isolate the power supply from the mains. It disables (or enables) only the switching control circuitry, i.e. output power on/off.

Servicing should be carried out only by qualified technicians and should be attempted only when powered through a mains isolating transformer of sufficient rating. It is **strongly recommended** that the mains supply to the whole of the repair and test area is supplied via an **earth leakage circuit breaker**.



3.1.2 Caution: Ventilation

Always ensure there is adequate ventilation around this unit and **do not** operate it in a sealed cabinet. The MTBF will decrease if the airflow is blocked. As a rule of thumb the life expectancy of this unit will approximately halve with every 10°C rise in temperature.

It is therefore recommended to:

- keep the ambient temperature low
- ensure that airflow is not restricted.



3.1.3 Caution: Replacing Components Connected To The Mains

To maintain operator safety and protection against fire, it is imperative that components connected to the mains supply (e.g. fuse, X & Y capacitors, filter chokes, etc.) and those that are critical to maintain isolation (optocouplers, transformers, etc.) are replaced **only** with their new, original equivalent.

To maintain performance levels it is strongly recommended that this policy is applied to every component that is replaced.

3.1.4 Caution: Handle With Care

Although this is a lightweight unit, it contains a number of quite heavy and fragile individual components which are mounted directly on the PCB. Severe mechanical shock may damage the PCB (i.e. solder joints, copper tracks) and/or components (i.e. fragile ferrite magnetic materials).

3.1.5 Caution: Heatsink/Case Temperature

The 2 covers of this power supply act as heatsinks for the internal power semi-conductors. Under some conditions the top and bottom sections of these covers and internal heatsinks may reach temperatures of over 100C. Handle with extreme care after prolonged operation.

3.1.6 Caution: Earthing Of Rack Frame



The power supply case is internally connected to mains earth. Because the unit's case and the rack frame in which it is usually installed are painted, a secure electrical earthing connection between the unit and the rack is **not** guaranteed (i.e. it is reliant on breaking through the paint coating).

It is therefore strongly advised that an additional and secure electrical connection is provided by means of the supplied earth lead (refer to Section 7.2). Failure to do so may result in harmful voltage potentials between the power supply and rack frame, and/or miscellaneous power supply switching noise problems in both receivers and transmitters.

Note: Failure to comply with the above instruction may result in the power supply falling short of the emissions requirements of ETS 300-279.

3.1.7 Caution: Cabinet Requirements To Meet Safety Specifications



In order to meet stringent safety obligations, it is imperative that the power supply is mounted in a cabinet which meets the requirements of IEC950. Specifically the top and sides of the cabinet must comply with one of the following:

- holes must not exceed 5mm in any dimension, or
- holes must not exceed 1mm in width regardless of length, or
- side panels must be provided with louvres that are shaped to deflect outwards an external vertically falling object, or
- tops must be so constructed that direct, vertical entry of a falling object is prevented from reaching bare parts by means of a trap or restriction.

Additionally, for units mounted in a slimline configuration, the bottom of the cabinet must be constructed so as to contain any material emitted from the unit under fault conditions which could ignite the supporting surface. ***If in doubt, refer to IEC950 or your nearest approved Tait Dealer or Service Centre.***

3.2 Mechanical

3.2.1 Construction

All electrical components (except the fan in the T808) are mounted on and soldered to a single large PCB. This PCB is mounted onto 2 identical extruded aluminium bars which provide heatsinking for the power semiconductors, as well as mechanical support for the whole power supply. Both front and rear panels are attached to these extrusions. Two identical vented covers on either side of the PCB assembly complete the simple but effective power supply packaging.

The mechanical construction of the T807/808 provides heatsinking, EMI shielding and user protection, and is also designed for ease of servicing and mounting.

3.2.2 Disassembly Instructions

Warning: Observe the precautions regarding lethal voltages outlined in Section 3.1 of this Manual before disassembling this unit.

3.2.2.1 To Gain Access To The Component Side Of The PCB

This will give access to the fuse, 115V/230V switch or links and the output adjust trim pots.

Remove the 2 guide rail screws at the rear of the right hand cover (top and bottom).

Remove the 8 countersunk screws holding the right hand cover onto the extruded rails (as viewed from the front of the unit).

Remove the right cover.

3.2.2.2 To Gain Access To The Solder Side Of The PCB

Remove the 2 guide rail screws at the rear of the left hand cover (top and bottom).

Remove the 8 countersunk screws holding the left hand cover onto the extruded rails (as viewed from the front of the unit).

Remove the left cover.

3.2.3 Reassembly Instructions

Refit the left and right covers in the reverse order to which they were removed.

Ensure that the heat transfer surfaces are clean and add new heatsink compound if necessary.

Power devices Q1, Q2 and D43 must be mounted correctly and electrically isolated from their respective heatsinks (see Section 3.3).

Replace the covers and tighten the screws to the correct torque.

3.2.4 Screw Torques

It is important to tighten the cover securing screws to the correct torque to ensure that the T807/808 maintains its specified performance.

We recommend the following torque settings:

Cover Screws	.. 8 - 10lb-in./0.88 - 1.1Nm
PCB To Rails	.. 8 - 10lb-in./0.88 - 1.1Nm
Power MOSFET Transistors (Q1 & Q2)	.. 8 - 10lb-in./0.88 - 1.1Nm
Output Rectifier (D43)	.. 4 - 6lb-in/0.44 - 0.66Nm
Front/Rear Panels and Guide Screws	.. 4 - 5lb-in/0.44 - 0.55Nm

3.3 Component Replacement

3.3.1 Critical Components

The components in the control loop stabilisation part of the circuit are critical in both value and type. Ensure that only exact equivalents are used for repair.

The components connected to the mains input and/or labelled "X" or "Y" are special components complying with safety regulations and should be replaced only with similarly specified parts to ensure continued safety protection (refer to Section 3.1.5).

3.3.2 To Replace The Power Mosfet Transistors (Q1 & Q2)

Remove the transistor clamping bar and devices, taking care **not** to damage the film insulator.

Reassemble the new MOSFET transistors with an undamaged or new thermal film insulator and new thermal compound, using the clamping bar, M3x25 countersunk pozidrive screw and nut.

Ensure that transistors Q1 and Q2 are assembled correctly with adequate thermal compound and are both seated straight and square. Check for unevenness and burrs on the mounting surfaces - the thermal insulator is only 0.05mm (2 mil/0.002") thick so it is very important that the mounting surfaces are clean.

Tighten the screw and nut to the correct torque.

Trim the legs of the transistors and solder.

Note 1: Always replace both Q1 and Q2, as well as D14, D15, D18 and D19. Even when only one of the transistors seems to be faulty, it is very likely that both transistors and all 4 diodes are also faulty or damaged.

Note 2: After any significant repair work it is recommended that the further fault finding and run-up procedure outlined in Section 6.4 is carried out **before** the unit is reconnected to the mains supply.

3.3.3 To Replace The Output Rectifier (D43)

Remove the rectifier, taking care not to damage the insulating gasket.

Attach a new rectifier complete with undamaged or new top hat (T807 only) and thermal film insulator, using the M3x16 countersunk pozidrive screw, spring washer and nut.

D43 is a thermally highly stressed component and incorrect assembly will result in a significant reduction in component life.

Tighten the screw and nut to the correct torque (refer to Section 3.2.2).

Trim the legs of the rectifier and solder.

Note: After any significant repair work it is recommended that the further fault finding and run-up procedure outlined in Section 6.4 is carried out **before** the unit is reconnected to the mains supply.

3.4 Technical Instructions

From time to time Technical Instructions (TIs) are issued by the Radio Infrastructure Engineering Division of Tait Electronics. These TIs may be used to update equipment or information, or to meet specific operational requirements.

Printed below is a list of TIs applicable to the T807/808. You may wish to file a copy of each TI in this Section for your own reference.

TI No.	Title	Date
358	T807/808 remote sensing of output voltage	10/06/91
365	T807/808 improved earthing for noise interference suppression	29/07/91

